

*Study & Master*

# Geography

**CAPS**



**Teacher's Guide**

Helen Collett • Norma Catherine Winearls  
Peter J Holmes

Grade  
**12**

***Study & Master***

# **Geography**

## **Grade 12 Teacher's Guide**

Helen Collett • Norma Catherine Winearls • Peter J Holmes



CAMBRIDGE UNIVERSITY PRESS

Cambridge, New York, Melbourne, Madrid, Cape Town,  
Singapore, São Paulo, Delhi, Mexico City

Cambridge University Press  
The Water Club, Beach Road, Granger Bay, Cape Town 8005, South Africa

[www.cup.co.za](http://www.cup.co.za)

© Cambridge University Press 2013

This publication is in copyright. Subject to statutory exception  
and to the provisions of relevant collective licensing agreements,  
no reproduction of any part may take place without the written  
permission of Cambridge University Press.

First published 2013

ISBN 978-1-107-38162-9

Editor: Barbara Hutton  
Proofreader: Anthea Johnstone  
Artists: Sue Abraham and Peter Holmes  
Typesetter: Brink Publishing & Design  
Cover image: Gallo Images/Wolfgang Poelzer/Getty Images

.....  
ACKNOWLEDGEMENTS

*Photographs:* Peter Holmes: pp. 267, 271, 273 and 274

*Maps:* Chief Directorate: National Geo-spatial Information: Department of Rural Development  
and Land Reform: pp. 189, 233–235 and 284–289

.....  
Cambridge University Press has no responsibility for the persistence or  
accuracy of URLs for external or third-party internet websites referred to in  
this publication, and does not guarantee that any content on such websites is,  
or will remain, accurate or appropriate. Information regarding prices, travel  
timetables and other factual information given in this work are correct at  
the time of first printing but Cambridge University Press does not guarantee  
the accuracy of such information thereafter.

.....  
NOTICE TO TEACHERS

The photocopy masters in this publication may be photocopied or  
distributed [electronically] free of charge for classroom use within the  
school or institution which purchases the publication. Worksheets and  
copies of them remain in the copyright of Cambridge University Press  
and such copies may not be distributed or used in any way outside the  
purchasing institution.

.....  
Every effort has been made to trace copyright holders. Should any infringements have occurred,  
please inform the publishers who will correct these in the event of a reprint.

.....  
If you want to know more about this book or any other Cambridge University Press publication,  
phone us at +27 21 412 7800, fax us at +27 21 419 8418 or send an e-mail to [capetown@cambridge.org](mailto:capetown@cambridge.org)

---

# Contents

---

<b>1. Introduction</b>	<b>1</b>
<b>2. Lesson-by-lesson</b>	<b>19</b>
<b>TERM 1</b>	
<b>Module 1: Climate and weather (regional and local weather systems): Geographical knowledge</b>	<b>21</b>
Unit 1: Mid-latitude cyclones	22
Unit 2: Tropical cyclones	25
Unit 3: Subtropical anticyclones and associated weather conditions	29
Unit 4: Valley climates	32
Unit 5: Urban climates	35
<b>Module 2: Geomorphology: Geographical knowledge</b>	<b>38</b>
Unit 1: Drainage systems in South Africa	39
Unit 2: Fluvial processes	44
Unit 3: Catchment and river management	48
<b>Module 3: Climatology and geomorphology: Geographical skills and techniques</b>	<b>52</b>
Unit 1: Mapwork techniques	53
Unit 2: Topographic maps	56
Unit 3: Aerial photographs and orthophoto maps	61
Unit 4: Geographical Information Systems (GISs) (appropriate to climatology and geomorphology)	64
<b>Review: Term 1</b>	<b>66</b>
<b>Assessment Task 1: Climate and weather; Geomorphology; Geographical skills and techniques</b>	<b>171</b>
<b>Test 1: Climate and weather; Geomorphology</b>	<b>173</b>
<b>TERM 2</b>	
<b>Module 4: Rural settlements: Geographical knowledge</b>	<b>70</b>
Unit 1: Study of settlements	71
Unit 2: Rural settlements	74
Unit 3: Rural settlement issues	78
<b>Module 5: Urban settlements: Geographical knowledge</b>	<b>83</b>
Unit 1: Urban settlements	84
Unit 2: Urban hierarchies	88
Unit 3: Urban structure and patterns	91
Unit 4: Urban settlement issues	94

---

# Contents

---

<b>Module 6: Rural and urban settlements: Geographical skills and techniques</b>	<b>98</b>
Unit 1: Mapwork skills	98
Unit 2: Geographical Information Systems (GISs) (appropriate to rural and urban settlement)	102
<b>Review: Term 2</b>	<b>106</b>
<b>Assessment Task 2: Rural settlements; Urban settlements; Geographical skills and techniques</b>	<b>177</b>
<b>Mid-year examination (Paper 1 and Paper 2)</b>	<b>179</b>
<b>TERM 3</b>	
<b>Module 7: Economic geography of South Africa: Geographical knowledge</b>	<b>109</b>
Unit 1: Structure of the economy	110
Unit 2: Agriculture	113
Unit 3: Mining	120
Unit 4: The secondary and tertiary sectors	123
Unit 5: Strategies for industrial development	128
Unit 6: The informal sector	132
<b>Module 8: Economic geography of South Africa: Geographical skills and techniques</b>	<b>135</b>
Unit 1: Mapwork skills	136
Unit 2: Topographic maps	138
Unit 3: Geographical Information Systems (GISs)	140
Unit 4: Using atlases (revision)	142
<b>Review: Term 3</b>	<b>144</b>
<b>Assessment Task 3: Economic geography of South Africa; Geographical skills and techniques</b>	<b>202</b>
<b>Test 2: Economic Geography of South Africa</b>	<b>204</b>
<b>TERM 4</b>	
<b>Module 9: Revision</b>	<b>147</b>
Unit 1: Climate and weather (regional and local weather systems)	147
Unit 2: Geomorphology	152
Unit 3: Rural settlements	154
Unit 4: Urban settlements	158
Unit 5: Economic geography of South Africa	161
Unit 6: Geographical skills and techniques	165
<b>Examination preparation</b>	<b>245</b>
<b>Trial examination (Paper 1 and Paper 2)</b>	<b>209</b>
<b>3. Formal assessment</b>	<b>169</b>
<b>4. Resources</b>	<b>257</b>
<b>5. Documents</b>	<b>299</b>

## 1. INTRODUCTION

1. Curriculum and Assessment Policy Statement (CAPS)	2
2. Geography as a subject	2
3. How <i>Study &amp; Master Geography</i> Grade 12 works	4
4. Grade 12 Year Plan	6



## 1. Curriculum and Assessment Policy Statement (CAPS)

A single Curriculum and Assessment Policy Statement (CAPS) exists for each school subject. The CAPS for each subject details the minimum outcomes and standards of the learning process as well as assessment processes and procedures.

For more information on the CAPS, please see Section 1 of the CAPS document for Geography.

## 2. Geography as a subject

### Aims

Geography is an elective subject that focuses on the study of the human and the physical environments. There are different branches of Geography (for example, Physical Geography and Human Geography) but they all focus on the concept of space in a continuously changing environment.

Geography in Grades 10 to 12 seeks to develop the following knowledge, skills and attitudes in the learners:

- explaining and interpreting both physical and human geographical processes
- describing and explaining the dynamic interrelationship between the physical and human worlds
- developing knowledge about where places are and the nature of a range of different places at different scales
- practising essential transferable skills – literacy, numeracy, oracy, graphicacy
- promoting the use of new technologies, such as Information Communication Technology (ICT) and Geographical and Information Systems (GIS)
- developing a commitment towards sustainable development
- creating awareness and sensitivity for inequality in the world
- fostering empathy, tolerance and fairness
- making and justifying informed decisions and judgements about social and environmental issues.

### Geography topics

The topics in the Geography CAPS (Grades 10–12) can be explored by focusing on the ‘big ideas’ of place, spatial processes, spatial distribution patterns, and the interaction between the human and natural environment. These, coupled with the posing of key questions, provide a launching pad for geographical explorations and investigations.

The chart below shows the methods of enquiry used in Geography, together with key questions asked, and the concepts explored and investigated.

METHOD OF ENQUIRY	KEY QUESTIONS	CONCEPTS
Observation	What is it? What is it like? Who or what is affected?	physical and human processes, awareness, perception, characteristics, similarities and differences

METHOD OF ENQUIRY	KEY QUESTIONS	CONCEPTS
Description	Where does it occur? Why is it there?	location, place, region, space, distribution, pattern, scale, spatial association
Analysis and explanation	What happened or is happening? Why did it happen? How is it changing?	interdependence, causes and processes
Evaluation and prediction	What are the effects? What is likely to happen?	environmental impact, social impact, interdependence, spatial interaction, spatial organisation, human–environment interaction, cause, process, time, behaviour, consequence, justice, quality of life, environmental quality, welfare, costs and benefits

Geographical knowledge, skills and techniques should be taught in an integrated way in each of the following topics in Grade 12:

- Climate and weather (regional and local weather systems) (Term 1)
- Geomorphology (Term 1)
- Settlement geography (rural and urban settlements) (Term 2)
- Economic geography of South Africa (Term 3).

For more information on Geography as a subject, please see Section 2 of the CAPS document.

### Time allocation

Geography is allocated four hours of teaching time per week in Grades 10 to 12. Revision, consolidation and assessment (formal and informal) are included in this allocation. It is recommended that in addition to this, six hours of fieldwork be undertaken by the learners. Most of this will need to be completed outside of lesson time.

The topics are weighted differently in terms of time allocation. This weighting should not be seen as a statement about the relative importance of the topics since each is equally important. In Grade 12 the topics are weighted as shown on the table on the next page.



Topic	Focus	Time allocation	Term
Climate and weather (regional and local weather systems)	Geographical knowledge	14 hours	Term 1
	Geomorphology	12 hours	
	Geographical skills and techniques	7 hours	
	Assessment and consolidation	3 hours	
Settlement geography (rural and urban settlements)	Geographical knowledge	29 hours	Term 2
	Geographical skills and techniques	5 hours	
	Assessment and consolidation	2 hours	
Economic geography of South Africa	Geographical knowledge	25 hours	Term 3
	Geographical skills and techniques	7 hours	
	Assessment and consolidation	3 hours	
Revision	Climate and weather	3 hours	Term 4
	Geomorphology	3 hours	
	Settlement geography (rural and urban settlements)	3 hours	
	Economic geography of South Africa	3 hours	
	Geographical skills and techniques	3 hours	

### 3. How Study & Master Geography Grade 12 works

#### Course components

*Study & Master Geography* Grade 12 consists of a:

- Learner's Book
- Teacher's Guide.

#### Learner's Book

The Learner's Book is divided into nine modules that cover the different Geography topics. There are three modules allocated to each topic. The first two modules focus specifically on the geographical knowledge associated with the topic, while the third module focuses on the geographical skills and

techniques associated with it. The final module in Term 4 consists of revision for all the topics, knowledge, skills and techniques covered in Grade 12 Geography.

The modules are further divided into units and activities. Each module has three or more units, each of which covers an area of the topic.

There is a Review section at the end of Terms 1–3 which learners can use to revise the term’s work in preparation for tests and examinations. Term 4 covers revision. In addition, examination practice is provided at the end of the Learner’s Book. This consists of revision activities and examination papers which the learners can complete.

Formal assessment opportunities are included in the Learner’s Book in the form of three Formal Assessment Tasks. All other formal assessment activities (tests and examinations) are provided in the Teacher’s Guide.

### **Teacher’s Guide**

The Teacher’s Guide provides information and guidance on:

- Geography as a subject (Section 1)
- planning for the Grade 12 year and lessons (Sections 1 and 2)
- using the modules and units in the Learner’s Book to create lessons (Section 2)
- suggested answers for all activities in the Learner’s Book (Sections 2 and 4)
- suggested remedial and extension activities (Section 2)
- informal assessment suggestions (Section 2)
- a programme of assessment (Section 3)
- two tests (Section 3)
- a mid-year examination: Paper 1 and Paper 2 (Section 3)
- trial examination: Paper 1 and Paper 2 (Section 3)
- guidance on the assessment of all Formal Assessment Tasks (Section 3)
- memorandums for all Formal Assessment Tasks (Section 3)
- recording and reporting on formal assessment (Section 3)
- a list of useful websites (Section 4)
- additional worksheets and activities (Section 4).

Section 2 mirrors the Learner’s Book and is divided into modules. It indicates how the modules and units in the Learner’s Book can be used to create lessons.

### **Inclusivity**

An important part of teaching is to accommodate all learners, including those who experience barriers to learning. *Study & Master Geography* Grade 12 takes into account that learners come from different backgrounds and have different abilities. So it offers learning material that learners can relate to, while extending their learning and experience. There are a variety of types of activities – activities that appeal to learners of all levels and backgrounds, and that offer opportunities to work individually, in pairs, in groups or as a whole class. This Teacher’s Guide also provides remedial and extension activities for each unit which teachers need when they have to manage a class of diverse learners. Section 4 (Resources) also provides a few worksheets for learners and ideas for activities.

#### 4. Grade 12 Year Plan

The table below indicates how *Study & Master Geography* Grade 12 covers all the requirements of the CAPS for Geography and how it is intended for use in the 40 weeks in the school year.

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
1	1	Module 1 Climate and weather (regional and local weather systems); Geographical knowledge	1	Mid-latitude cyclones	3	<ul style="list-style-type: none"> <li>• general characteristics;</li> <li>• areas where mid-latitude cyclones form;</li> <li>• conditions necessary for their formation;</li> <li>• stages of development and related weather conditions;</li> <li>• weather patterns associated with cold, warm, and occluded fronts; and</li> <li>• reading and interpreting satellite images and synoptic weather maps.</li> </ul>	Learner's Book pp. 11–21; Teacher's Guide pp. 22–25 <ul style="list-style-type: none"> <li>• atlases;</li> <li>• media information;</li> <li>• <a href="http://www.weathersa.co.za">http://www.weathersa.co.za</a> for weather prediction, satellite images and synoptic weather charts; and</li> <li>• <a href="http://www.weathersa.co.za">http://www.weathersa.co.za</a></li> </ul>
1	1–2		2	Tropical cyclones	4	<ul style="list-style-type: none"> <li>• general characteristics;</li> <li>• areas where tropical cyclones form;</li> <li>• factors necessary for their formation;</li> <li>• stages of development;</li> <li>• associated weather patterns;</li> <li>• reading and interpreting satellite images and synoptic weather maps;</li> <li>• case study of one recent tropical cyclone that affected southern Africa;</li> <li>• impact of tropical cyclones on human activities and the environment; and</li> <li>• strategies that help to prepare for and manage the effects of tropical cyclones.</li> </ul>	Learner's Book pp. 22–30; Teacher's Guide pp. 25–28

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
1	2–3		3	Subtropical anticyclones and associated weather conditions	3	<ul style="list-style-type: none"> <li>location of the high-pressure cells that affect South Africa;</li> <li>general characteristics of these high-pressure cells;</li> <li>anticyclonic air circulation around South Africa, and its influence on weather and climate;</li> <li>travelling disturbances associated with anticyclonic circulation: moisture front, line thunderstorms, coastal low-pressure systems and South African berg winds; and</li> <li>reading and interpreting satellite images and synoptic weather maps that illustrate weather associated with subtropical anticyclonic conditions.</li> </ul>	Learner's Book pp. 31–40; Teacher's Guide pp. 29–32
1	3		4	Valley climates	2	<ul style="list-style-type: none"> <li>the microclimate of valleys (the effect of the slope aspect);</li> <li>development of anabatic and katabatic winds, inversions, frost pockets and radiation fog; and</li> <li>the influence of local climates on human activities such as settlement and farming.</li> </ul>	Learner's Book pp. 41–48; Teacher's Guide pp. 32–34
1	4		5	Urban climates	2	<ul style="list-style-type: none"> <li>reasons for differences between rural and urban climates;</li> <li>urban heat islands – causes and effects;</li> <li>concept of pollution domes – causes and effects; and</li> <li>strategies to reduce the heat island effect.</li> </ul>	Learner's Book pp. 49–54; Teacher's Guide pp. 35–37

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
1	4–5	Module 2 Geomorphology: Geographical knowledge	1	Drainage systems in South Africa	5	<ul style="list-style-type: none"> <li>important concepts: drainage basin, catchment area, river system, watershed, tributary, river mouth, source, confluence, water table, surface run-off and groundwater;</li> <li>types of rivers: permanent, periodic, episodic and exotic;</li> <li>drainage patterns: dendritic, trellis, rectangular, radial, centripetal, deranged and parallel;</li> <li>drainage density;</li> <li>use of topographic maps to identify stream order and density; and</li> <li>discharge of a river: laminar and turbulent flow.</li> </ul>	<p>Learner's Book pp. 56–70; Teacher's Guide pp. 39–44</p> <ul style="list-style-type: none"> <li><a href="http://www.ga.water.usgs.gov/edu/watercycle.html">http://www.ga.water.usgs.gov/edu/watercycle.html</a>;</li> <li>information about SA rivers: <a href="http://www.dwaf.gov.za">http://www.dwaf.gov.za</a>;</li> <li><a href="http://www.uwsp.edu/geo/faculty/ritter/geog101/textbook/fluvialsystems/drainage_patterns.html">http://www.uwsp.edu/geo/faculty/ritter/geog101/textbook/fluvialsystems/drainage_patterns.html</a>;</li> <li><a href="http://www.slideshare.net/migratorycoconut/Chapter-81-massmovements">http://www.slideshare.net/migratorycoconut/Chapter-81-massmovements</a>; and</li> <li>rivers in local environment (fieldwork) and GIS, related to catchment areas</li> </ul>
1	5–6		2	Fluvial processes	4	<ul style="list-style-type: none"> <li>river profiles: transverse profile, longitudinal profile and their relationship to different stages of a river;</li> <li>identification and description of fluvial landforms: meanders, oxbow lakes, braided streams, floodplains, natural levees, waterfalls, rapids and deltas;</li> <li>river grading;</li> <li>rejuvenation of rivers: reasons and resultant features, such as knick points, terraces and incised meanders;</li> <li>river capture (stream piracy): the concepts of abstraction and river capture; features associated with river capture (captor stream, captured stream, misfit stream, elbow of capture, wind gap); and</li> <li>superimposed and antecedent drainage patterns.</li> </ul>	<p>Learner's Book pp. 71–91; Teacher's Guide pp. 44–48</p>

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
1	6–7		3	Catchment and river management	3	<ul style="list-style-type: none"> <li>importance of managing drainage basins and catchment areas;</li> <li>impact of people on drainage basins and catchment areas; and</li> <li>case study of one catchment area management strategy in South Africa.</li> </ul>	Learner's Book pp. 92–100; Teacher's Guide pp. 48–51
1	7	Module 3 Climatology and Geomorphology: Geographical skills and techniques	1	Mapwork techniques	2	<ul style="list-style-type: none"> <li>reading and interpreting synoptic weather maps, satellite images and other weather- and climate-related data;</li> <li>map and photograph interpretation – includes reading and analysis of physical and constructed features; and</li> <li>applying map-reading skills to maps and photographs.</li> </ul>	Learner's Book pp. 102–117; Teacher's Guide pp. 53–56
1	8		2	Topographic maps	2	<ul style="list-style-type: none"> <li>contours and landforms;</li> <li>cross sections;</li> <li>direction: magnetic north, true north and magnetic declination;</li> <li>gradient;</li> <li>intervisibility; and</li> <li>grid referencing.</li> </ul>	Learner's Book pp. 118–132; Teacher's Guide pp. 56–61
1	8		3	Aerial photographs and orthophoto maps	2	<ul style="list-style-type: none"> <li>interpreting vertical aerial photographs;</li> <li>orthophoto maps – identifying features; and</li> <li>comparing an orthophoto map with a topographic map.</li> </ul>	Learner's Book pp. 133–142; Teacher's Guide pp. 61–63

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
1	9		4	Geographical Information Systems (GISs) (appropriate to climatology and geomorphology)	1	<ul style="list-style-type: none"> <li>examination of GIS information for different catchment areas; and</li> <li>developing a "paper GIS" from existing maps, photographs or other records on tracing paper.</li> </ul>	Learner's Book pp. 143–150; Teacher's Guide pp. 64–66
		<b>Assessment Task 1</b>			Homework	<b>Assessment and consolidation</b> Data-handling task (40 marks)	Learner's Book pp. 151–152; Teacher's Guide pp. 169–171
1	9	<b>Review: Term 1</b>			3	<b>Assessment and consolidation</b>	Learner's Book pp. 153–158; Teacher's Guide pp. 66–69
	10	<b>Test 1</b>			1	<b>Assessment and consolidation</b> Test (20 marks)	Teacher's Guide pp. 171–174
2	1	<b>Module 4</b> Rural settlements: Geographical knowledge	1	<b>Study of settlements</b>	3	<ul style="list-style-type: none"> <li>concept of settlement;</li> <li>site and situation;</li> <li>rural and urban settlements; and</li> <li>settlement classification according to size, complexity, pattern and function.</li> </ul>	Learner's Book pp. 161–170; Teacher's Guide pp. 71–74 <ul style="list-style-type: none"> <li>atlases;</li> <li>media information;</li> <li><a href="http://www.statsa.gov.za">http://www.statsa.gov.za</a>;</li> <li>topographic and orthophoto maps;</li> <li>vertical aerial photographs or satellite images (such as Google Earth); and</li> <li>telephone directory for types of economic activities in a settlement</li> </ul>
2	1–2		2	<b>Rural settlements</b>	5	<ul style="list-style-type: none"> <li>how site and situation affect the location of rural settlements;</li> <li>classification of rural settlements according to pattern and function;</li> <li>reasons for different shapes of settlements: round, linear, T-shaped and crossroads; and</li> <li>land use in rural settlements.</li> </ul>	Learner's Book pp. 171–180; Teacher's Guide pp. 74–77

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
2	3–4		3	Rural settlement issues	6	<ul style="list-style-type: none"> <li>rural-urban migration;</li> <li>causes and consequences of rural depopulation on people and the economy;</li> <li>case study that illustrates effects of rural depopulation and strategies to address them; and</li> <li>social justice issues in rural areas, such as access to resources and land reform.</li> </ul>	Learner's Book pp. 181–194; Teacher's Guide pp. 78–82
2	4–5	Module 5 Urban settlements: Geographical knowledge	1	Urban settlements	4	<ul style="list-style-type: none"> <li>the origin and development of urban settlements – urbanisation of the world's population;</li> <li>how site and situation affect the location of urban settlements; and</li> <li>classification of urban settlements according to function, such as central places, trade and transport, break-of-bulk points, specialised cities, junction towns and gateway towns or gap towns.</li> </ul>	Learner's Book pp. 196–207; Teacher's Guide pp. 84–88
2	5		2	Urban hierarchies	2	<ul style="list-style-type: none"> <li>the concepts of urban hierarchy, central place, threshold population, sphere of influence and range of goods;</li> <li>lower- and higher-order functions and services; and</li> <li>lower- and higher-order centres.</li> </ul>	Learner's Book pp. 208–213; Teacher's Guide pp. 88–91



Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
2	6		3	Urban structure and patterns	4	<ul style="list-style-type: none"> <li>internal structure and patterns of urban settlements: land use zones; concept of urban profile; and factors influencing the morphological structure of a city;</li> <li>models of urban structure, such as multiple-nuclei model, the modern American-Western city, the Third World city and the South African city; and</li> <li>changing urban patterns and land use in South African cities.</li> </ul>	Learner's Book pp. 214–226; Teacher's Guide pp. 91–94
2	7–8		4	Urban settlement issues	5	<ul style="list-style-type: none"> <li>recent urbanisation patterns in South Africa;</li> <li>urban issues related to rapid urbanisation: lack of planning, housing shortage, overcrowding, traffic congestion and problems with service provision;</li> <li>the growth of informal settlements and associated issues: case studies from the world and South Africa; and</li> <li>case studies that show how selected urban areas in South Africa are managing urban challenges, and handling environmental, economic, and social justice concerns.</li> </ul>	Learner's Book pp. 227–238; Teacher's Guide pp. 94–97
2	8	Module 6 Rural and urban settlements: Geographical skills and techniques	1	Mapwork skills	3	<ul style="list-style-type: none"> <li>applying map skills and techniques: scale, contours and cross-sections; and</li> <li>map and photograph interpretation: including reading and analysis of physical and constructed features.</li> </ul>	Learner's Book pp. 240–246; Teacher's Guide pp. 98–102

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
2	9		2	Geographical Information Systems (GISs) (appropriate to rural and urban settlement)	2	<ul style="list-style-type: none"> <li>GIS concepts: remote-sensing and resolution;</li> <li>spatial and attribute data; vector and raster data;</li> <li>data standardisation, data sharing and data security;</li> <li>data manipulation: data integration, buffering, querying and statistical analysis;</li> <li>application of GIS by Government and the private sector; relate to weather and settlement topics above; and</li> <li>developing a 'paper GIS' from existing maps, photographs or other records on layers of tracing paper.</li> </ul>	Learner's Book pp. 247–258; Teacher's Guide pp. 102–106
		<b>Assessment Task 2</b>			Homework	<b>Assessment and consolidation</b> Mapwork task (70 marks)	Learner's Book pp. 259–261; Teacher's Guide pp. 177–178
2	9	<b>Review: Term 2</b>			2	<b>Assessment and consolidation</b>	Learner's Book pp. 262–265; Teacher's Guide pp. 106–108
	10	<b>Mid-year examination</b>				<b>Assessment and consolidation</b> Mid-year examination (300 marks)	Teacher's Guide pp. 179–201
3	1	<b>Module 7</b> Economic geography of South Africa: Geographical knowledge	1	<b>Structure of the economy</b>	3	<ul style="list-style-type: none"> <li>economic sectors (primary, secondary, tertiary and quaternary);</li> <li>economic sectors' contribution to the South African economy: value and employment; and</li> <li>use of statistical and graphical information.</li> </ul>	Learner's Book pp. 269–274; Teacher's Guide pp. 110–113 <ul style="list-style-type: none"> <li>atlases, topographic maps, aerial photographs and media information;</li> <li>satellite images;</li> <li><a href="http://www.statssa.gov.za">http://www.statssa.gov.za</a>;</li> <li>food security: <a href="http://www.fanrpan.org">http://www.fanrpan.org</a>; and</li> <li>information on Maputo Corridor: <a href="http://www.mcli.co.za/mcli-web/mdc_sdi.htm">http://www.mcli.co.za/mcli-web/mdc_sdi.htm</a></li> </ul>

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
3	1–2		2	<b>Agriculture</b>	5	<ul style="list-style-type: none"> <li>• contribution of agriculture to the South African economy;</li> <li>• the role of small-scale farmers and large-scale farmers;</li> <li>• main products produced: home market and export market;</li> <li>• factors that favour and hinder agriculture in South Africa, such as climate, soil, land ownership and trade;</li> <li>• the importance of food security in South Africa – influencing factors; and</li> <li>• case studies related to food security in South Africa.</li> </ul>	Learner's Book pp. 275–287; Teacher's Guide pp. 113–120
3	3–4		3	<b>Mining</b>	5	<ul style="list-style-type: none"> <li>• contribution of mining to the South African economy;</li> <li>• significance of mining to the development of South Africa;</li> <li>• factors that favour and hinder mining in South Africa; and</li> <li>• a case study of one of South Africa's main minerals in relation to the above points.</li> </ul>	Learner's Book pp. 288–294; Teacher's Guide pp. 120–123

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
3	4–5		4	<b>The secondary and tertiary sectors</b>	6	<ul style="list-style-type: none"> <li>• contribution of secondary and tertiary sectors to the South African economy;</li> <li>• types of industries, such as heavy, light, raw material orientated, market orientated, footloose industries, ubiquitous industries and bridge (break-of-bulk point) industries;</li> <li>• factors influencing industrial development in South Africa, such as raw materials, labour supply, transport infrastructure, political intervention, competition and trade;</li> <li>• South Africa's industrial regions: <ul style="list-style-type: none"> <li>– PWV–Gauteng, Durban–Pinetown, Port Elizabeth–Uitenhage, South Western Cape Metropole;</li> <li>– factors influencing their location</li> <li>– main industrial activities; and</li> </ul> </li> <li>• case studies from South Africa to illustrate the above.</li> </ul>	Learner's Book pp. 295–306; Teacher's Guide pp. 123–128
3	5–6		5	<b>Strategies for industrial development</b>	3	<ul style="list-style-type: none"> <li>• overview of apartheid and post-apartheid industrial development strategies;</li> <li>• concept and distribution of Industrial Development Zones (IDZs);</li> <li>• case studies of two Spatial Development Initiatives (SDIs); and</li> <li>• issues associated with industrial centralisation and decentralisation.</li> </ul>	Learner's Book pp. 307–311; Teacher's Guide pp. 128–131

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
3	6–7		6	The informal sector	4	<ul style="list-style-type: none"> <li>concept and characteristics of informal sector employment;</li> <li>reasons for high informal sector employment in South Africa;</li> <li>challenges facing South Africa's informal sector; and</li> <li>case studies to illustrate the above in the South African context.</li> </ul>	Learner's Book pp. 312–317; Teacher's Guide pp. 132–134
3	7	Module 8 Economic Geography of South Africa: Geographical skills and techniques	1	Mapwork skills	2	<ul style="list-style-type: none"> <li>consolidation of map skills from Grades 10, 11 and 12;</li> <li>map and photograph interpretation – includes reading and analysis of physical and constructed features; and</li> <li>applying map-reading skills to maps and photographs.</li> </ul>	Learner's Book pp. 319–322; Teacher's Guide pp. 136–137
3	8		2	Topographic maps	2	<p><b>Topographic maps</b></p> <ul style="list-style-type: none"> <li>applying map skills and techniques: scale, contours and cross-sections; and</li> <li>grid referencing.</li> </ul>	Learner's Book pp. 323–326; Teacher's Guide pp. 138–140
3	8		3	Geographical Information Systems (GISs)	2	<ul style="list-style-type: none"> <li>examination of a selection of satellite images;</li> <li>GIS concepts: remote sensing and resolution;</li> <li>spatial and attribute data; vector and raster data;</li> <li>data standardisation, data sharing and data security;</li> <li>data manipulation: data integration, buffering, querying and statistical analysis; and</li> <li>developing a "paper GIS" from existing maps, photographs or other records on tracing paper.</li> </ul>	Learner's Book pp. 327–332; Teacher's Guide pp. 140–142

Term	Week/s	Module	Unit no.	Unit title	No. of hours	Geography CAPS content	Resources
3	9		4	Using atlases (revision)	1	<ul style="list-style-type: none"> <li>examining thematic maps; and</li> <li>comparing information from different maps.</li> </ul>	Learner's Book pp. 333–338; Teacher's Guide pp. 142–144
		<b>Assessment Task 3</b>			Homework	<b>Assessment and consolidation</b> Research/essay-writing task (60 marks)	Learner's Book pp. 337–338; Teacher's Guide pp. 202–204
3	9	<b>Review: Term 3</b>			3	<b>Assessment and consolidation</b>	Learner's Book pp. 339–340; Teacher's Guide pp. 144–146
	10	<b>Test 2</b>				<b>Assessment and consolidation</b> Test (20 marks)	Teacher's Guide pp. 204–208
4	1	<b>Module 9</b> Revision	1	Climate and weather (regional and local weather systems)	3	<b>Climate and weather (regional and local weather systems)</b>	Learner's Book pp. 343–349; Teacher's Guide pp. 147–151
4	1–2		2	Geomorphology	3	<b>Geomorphology</b>	Learner's Book pp. 350–352; Teacher's Guide pp. 152–154
4	2		3–4	Rural settlements; Urban settlements	3	<b>Settlement geography (rural and urban settlements)</b>	Learner's Book pp. 353–357; 358–360; Teacher's Guide pp. 154–161
4	3		5	Economic geography of South Africa	3	<b>Economic geography of South Africa</b>	Learner's Book pp. 361–365; Teacher's Guide pp. 161–165
4	4		6	Geographical skills and techniques	3	<b>Geographical skills and techniques</b>	Learner's Book pp. 366–372; Teacher's Guide pp. 165–168
4	5–6	<b>Preparation for end-of-year examination</b>				<b>Assessment and consolidation</b> Trial examination (Paper 1 and Paper 2) (300 divided by 30 = 10 marks)	Learner's Book pp. 374–394; Teacher's Guide pp. 209–244
4	6–10	<b>External examination</b>				<b>Assessment and consolidation</b> Examination:	External
					3	Paper 1	
					1½	Paper 2	



## 2. LESSON-BY-LESSON

This section contains teaching notes for the modules in the Learner's Book and answers to the activities. It also provides informal assessment suggestions and suggested remedial and extension activities.

<b>General</b>	<b>20</b>
<b>TERM 1</b>	
<b>Module 1: Climate and weather (regional and local weather systems): Geographical knowledge</b>	<b>21</b>
<b>Module 2: Geomorphology: Geographical knowledge</b>	<b>38</b>
<b>Module 3: Climatology and geomorphology: Geographical skills and techniques</b>	<b>52</b>
Review: Term 1	66
<b>TERM 2</b>	
<b>Module 4: Rural settlements: Geographical knowledge</b>	<b>70</b>
<b>Module 5: Urban settlements: Geographical knowledge</b>	<b>83</b>
<b>Module 6: Rural and urban settlements: Geographical skills and techniques</b>	<b>98</b>
Review: Term 2	106
<b>TERM 3</b>	
<b>Module 7: Economic geography of South Africa: Geographical knowledge</b>	<b>109</b>
<b>Module 8: Economic geography of South Africa: Geographical skills and techniques</b>	<b>135</b>
Review: Term 3	144
<b>TERM 4</b>	
<b>Module 9: Revision</b>	<b>147</b>





## General

- Many of the activities are bite-sized, quick and easy to do. Because of this you can often work through as many as two or three activities in a lesson.
- The information boxes (those with a magnifying glass), case studies and other information in boxes in the Learner's Book provide additional information, examples, or applications for some teaching points in the main body text.
- Use a variety of approaches for reading these boxes – for example, read the box to the class, ask a learner to read the box to the class, or ask learners to read the box on their own (use this approach for short, easy-to-read boxes).
- In most cases, these boxes are there for teaching and learning purposes (they are always linked to activities), but not for revision purposes. Point out to your learners that when they use the book for revision, they need only focus on the main body text.
- In this Teacher's Guide, the instruction, 'Instruct the learners to work on Activity x', includes going through the answers with the class once they have completed the activity. This is unless the activity is set for, or finished off, as homework. In this case, remember to go through the answers to the activity at the start of the next lesson.

	<b>MODULE 1</b>	
<b>TERM 1</b> Learner's Book pages 10-54 Duration: 14 hours Lessons: 28 half-hour lessons, or 14 hour long lessons	<b>CLIMATE AND WEATHER (REGIONAL AND LOCAL WEATHER SYSTEMS): GEOGRAPHICAL KNOWLEDGE</b>	

## Curriculum and Assessment Policy Statement (CAPS) content

### Mid-latitude cyclones

- General characteristics
- Areas where mid-latitude cyclones form
- Conditions necessary for their formation
- Stages of development and related weather conditions
- Weather patterns associated with cold, warm, and occluded fronts
- Reading and interpreting satellite images and synoptic weather maps

### Tropical cyclones

- General characteristics
- Areas where tropical cyclones form
- Factors necessary for their formation
- Stages of development
- Associated weather patterns
- Reading and interpreting satellite images and synoptic weather maps
- Case study of one recent tropical cyclone that affected southern Africa
- Impact of tropical cyclones on human activities and the environment
- Strategies that help to prepare for and manage the effects of tropical cyclones

### Subtropical anticyclones and associated weather conditions

- Location of the high-pressure cells that affect South Africa
- General characteristics of these high-pressure cells
- Anticyclonic air circulation around South Africa, and its influence on weather and climate
- Travelling disturbances associated with anticyclonic circulation: moisture front, line thunderstorms, coastal low-pressure systems and South African berg winds
- Reading and interpreting satellite images and synoptic weather maps that illustrate weather associated with subtropical anticyclonic conditions

### Valley climates

- The microclimate of valleys (the effect of the slope aspect)
- Development of anabatic and katabatic winds, inversions, frost pockets and radiation fog
- The influence of local climates on human activities such as settlement and farming

### Urban climates

- Reasons for differences between rural and urban climates
- Urban heat islands – causes and effects
- Concept of pollution domes – causes and effects
- Strategies to reduce the heat island effect

## Key geographical skills and techniques

- using verbal, quantitative and symbolic data forms such as text, pictures, graph tables, diagrams and maps
- processing, interpreting and evaluating data

## Key words/concepts

mid-latitude cyclone; front; polar front; cold front; warm front; occluded front; occlusion; backing; cold occlusion; warm occlusion; tropical cyclone; eye; eyewall; spiral rainbands; hurricane; typhoon; storm surge; South Atlantic High; South Indian High; Kalahari High; anticyclone; temperature inversion; moisture front; line thunderstorm; coastal low; berg wind; ridge; trough; slope aspect; microclimate; shadow zone; insolation; terrestrial radiation; anabatic wind; katabatic wind; inversion; thermal belt; dew point; frost pocket; radiation fog; smog; urban climate; urban heat island; isotherm; albedo; pollution dome; condensation nuclei

Learner's Book  
pages 11–21  
Duration: 3 hours

## UNIT 1

## Mid-latitude cyclones

TERM 1, WEEK 1

## Curriculum and Assessment Policy (CAPS) content

### Mid-latitude cyclones

- General characteristics
- Areas where mid-latitude cyclones form
- Conditions necessary for their formation
- Stages of development and related weather conditions
- Weather patterns associated with cold, warm, and occluded fronts
- Reading and interpreting satellite images and synoptic weather maps

### Resources

- Learner's Book pages 11–21
- Websites (optional):
  - For information on climate and weather: <http://www.physicalgeography.net/fundamentals/contents.html> chapters 6 and 7 or <http://www.e-booksdirectory.com/details.php?ebook=1628>. This is a free, online text which is recommended
  - <http://www.weathersa.co.za/web/Home.asp?mw=w&f=> is the South African Weather Service's website, which is interesting with regard to regional forecasts.

### Preparation

- Read through the unit to familiarise yourself with the content.
- Refer back to Grades 10 and 11 where learners have received a background in physical geography – the atmosphere, its structure and composition in Grade 10, and the dynamics of the atmosphere (energy and air circulation) in Grade 11. This underpins the more complex weather features and phenomena which are studied in Grade 12.

- Work out your lesson plans (see page 298 of this Teacher’s Guide for assistance) for how you will go through the text and activities in Unit 1 – given the amount of classroom time you have.

### Teaching the unit

- Explain to the learners that there are different types of cyclones. This unit deals with mid-latitude cyclones.
- Not all cyclones are the same. Ask a leading question: Do you know why? This can be used to introduce learners to the key issues in the unit, which include:
  - What are the general characteristics of mid-latitude cyclones?
  - Where do they form?
  - What conditions are necessary for their formation?
  - What stages do they go through?
  - What weather patterns are associated with them?
- Go through the text and the images on pages 11–13 in the Learner’s Book with learners, making sure that they all understand the ideas and concepts. Continue in this way throughout the unit, i.e. working through the text and diagrams with learners, giving input, asking them to do activities, and then taking feedback.

### Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners’ answers.

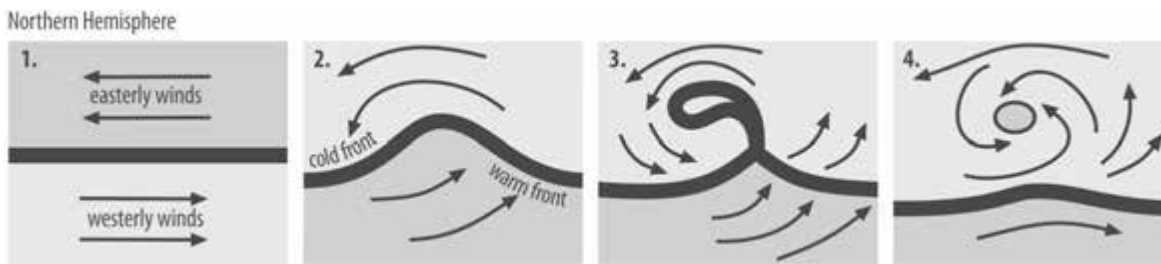
#### Activity 1 (Learner’s Book, page 13)

1. subpolar lows
2. They are carried by the strong westerly jetstream winds (which blow from west to east). (Remind learners that jetstreams flow high up in the atmosphere near the tropopause and are the result of global air circulation. They learnt about jetstreams in Grade 11.)
3. North America, Europe, Antarctica
4. South America, Africa, Australia
5. a. north  
b. The mid-latitude cyclones pass over in the South Atlantic Ocean in summer, missing South Africa. In winter, however, their path shifts northwards and so the cold fronts brush the Western Cape, bringing rain.

#### Activity 2 (Learner’s Book, page 15)

1. Diagram 1: The polar front forms where the cold polar easterly winds meet the warmer subtropical westerly winds, or where they move past each other.  
Diagram 2: A wave/kink forms in the polar front as the cold air pushes into and lifts the warm air. A low-pressure cell begins to form (warm air rises) and the warm and cold masses begin to twist around each other.  
Diagram 3: The cold air mass travels faster than the warm air mass, and so the cold front catches up to the warm front.  
Diagram 4: All the warm air is lifted off the ground by the cold air. The cyclone dies away.

- Diagram 2 = initial stage; Diagram 3 = occluded stage; Diagram 4 = dying/degeneration stage
- Check learners' drawings – they should be similar to Figure 1.1.6, but for the northern hemisphere.



**Activity 3** (Learner's Book, page 16)

- B (cirrus); C (altostratus); D (nimbostratus); E (cumulonimbus);  
A (cumulus)
- NW to W to SW
  - backing
  - anticlockwise; it's the opposite direction to that in which a mid-latitude cyclone rotates in the southern hemisphere

**Activity 4** (Learner's Book, page 18)

- Weather forecast warnings of heavy rains, snow and rough seas are important because they:
  - alert people in time so that they can avoid exposing themselves to potentially dangerous weather conditions
  - alert rescue services so that they are prepared for emergencies.
- Weather forecasts are particularly important to the farming, shipping and aircraft industries.
  - Warnings of snow are relevant to farmers, especially sheep farmers, who need to arrange shelter for their animals.
  - Warnings of rough seas are relevant to fishermen and sailors, who can then avoid going to sea.
  - Warnings of heavy rains are relevant to motorists and anyone (hikers, holidaymakers, tourists) planning outdoor activities, who can then change their plans and cancel outdoor activities.

**Activity 5** (Learner's Book, page 21)

- five
- eastwards/west to east
- 968 hPa
- cloudy/eight eighths; wind direction west (W); wind speed 30 knots
  - fine; clear; wind direction north-west (NW); wind speed 50 knots
- west (W) to south-west (SW)
  - the wind spirals around the low-pressure system in an anticlockwise direction
  - Wednesday; at least 24 hours/Wed–Thur
  - clear/sunny, but temperatures remain low
  - Friday
  - no; clear sunny conditions are predicted/forecast

## Informal assessment

### Activity 1

Learners should cross-check answers in pairs or small groups. As this is the first activity, there are some potential conceptual issues with regard to mid-latitude cyclones and their movement which you need to resolve at the start of this unit.

### Activity 2

Again, it is strongly recommended that learners cross-check answers in pairs or small groups, under your guidance. This work is not necessarily straightforward, and any weaknesses in conceptual understanding which slips through now could hamper the teaching of the rest of this module.

### Activity 3

Again, it is strongly recommended that learners cross-check answers in pairs or small groups, under your guidance.

### Activity 4

Learners must write their own answers, which they can then share in a class discussion.

### Activity 5

Provide the learners with answers, and ask them to mark their own answers as a form of quantitative self-assessment (a sort of a mini-test) at this stage and to round off the unit.

Learner's Book  
pages 22–30  
Duration: 4 hours

## UNIT 2

## Tropical cyclones

TERM 1, WEEKS 1–2

## Curriculum and Assessment Policy (CAPS) content

### Tropical cyclones

- General characteristics
- Areas where tropical cyclones form
- Factors necessary for their formation
- Stages of development
- Associated weather patterns
- Reading and interpreting satellite images and synoptic weather maps
- Case study of one recent tropical cyclone that affected southern Africa
- Impact of tropical cyclones on human activities and the environment
- Strategies that help to prepare for and manage the effects of tropical cyclones

### Resources

- Learner's Book, pages 22–30
- Websites (optional):
  - For information on climate and weather: <http://www.physicalgeography.net/fundamentals/contents.html> chapters 6 and 7 or <http://www.e-booksdirectory.com/details.php?ebook=1628>. This is a free, online text which is recommended

- <http://www.weathersa.co.za/web/Home.asp?mw=w&f=> is the South African Weather Service’s website, which is interesting with regard to regional forecasts.
- Search Google Images for diagrams of tropical cyclones, or photos. Because tropical storms such as Hurricane Sandy had such a devastating impact on the USA, material is quite freely available on the Internet.

### Preparation

- Read through the unit to familiarise yourself with the content.
- Refer back to the basics covered in Grades 10 and 11. Energy balances and the distribution of energy in the atmosphere (Grade 11) are particularly relevant to tropical cyclones. What these weather systems primarily do is assist in dispersing excess heat energy from the tropics in the directions of the poles. Do not confuse tropical cyclones with tornadoes, which are a more localised weather phenomenon.
- Work out your lesson plans (see page 298 of this Teacher’s Guide for assistance) for how you will go through the text and activities in Unit 2 – given the amount of classroom time you have.

### Teaching the unit

- Explain that tropical cyclones have a real and serious impact on southern Africa’s weather along the Indian Ocean coast.
- Ask learners if they can name any tropical cyclones. Do they know how these weather phenomena are named? (Answer: alphabetically)
- Explain that the key issues in this unit include:
  - What are the general characteristics of tropical cyclones?
  - Where do they form?
  - What factors are necessary for their formation?
  - What stages are associated with tropical cyclones?
  - What weather conditions are associated with tropical cyclones?
  - What impact do these systems have on the environment, and on humans?
  - How can their negative effects be managed?
- Read through pages 22–23 with learners and then ask them to do Activity 1. Continue in this way throughout the unit, i.e. working through the text and diagrams with learners, giving input, asking them to do activities, and then taking feedback.

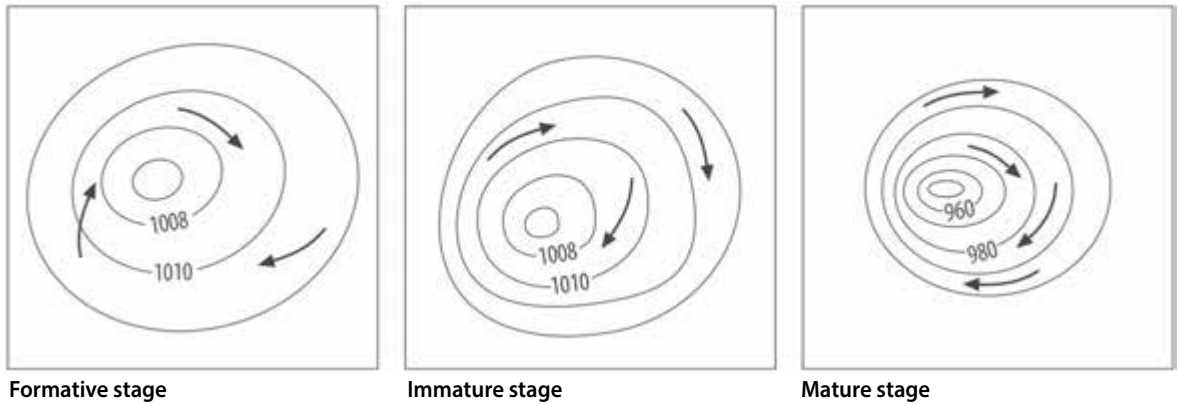
### Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners’ answers.

#### Activity 1 (Learner’s Book, page 24)

Name	Location
cyclones	Indian Ocean
hurricanes	Atlantic Ocean, eastern North Pacific Ocean
typhoons	western North Pacific Ocean
willy-willies	western South Pacific Ocean

**Activity 2** (Learner's Book, page 25)



Formative stage

Immature stage

Mature stage

**Activity 3** (Learner's Book, page 26)

- 990 hPa
- 50 knots
  - $90 \text{ km}\cdot\text{h}^{-1}$  (i.e.  $50 \times 1,8 \text{ km}$ )
- It is deflected by the Coriolis force; the pattern is clockwise in the Southern hemisphere (and anticlockwise in the northern hemisphere).
- very strong, destructive winds; heavy rainfall

**Activity 4** (Learner's Book, page 28)

- late January 2012/ 19–28 January 2012
- 9–10 days
- Partly. Tropical cyclones generally travel westwards, which cyclone Funso did at first. But instead of dying out over land, it revived and headed out again over the sea, travelling in a south-easterly direction.
- the centre of the cyclone; here conditions are calm, no wind, warm and cloudless/ no rain
- It weakened over the Mozambique coastline probably because it experienced some friction partly overland. It strengthened again out over the sea because it was refuelled by the supply of hot, moist air.
- flooding caused by heavy rains; damage to infrastructure such as roads, bridges, homes, electricity supplies and sewage systems; loss of life

**Activity 5** (Learner's Book, page 29)

Here is an example mini-essay of 205 words:

*Why is Mozambique vulnerable to tropical cyclones?*

Mozambique is prone to tropical cyclones because:

- of its latitudinal position – it lies within the tropics
- of its coastal nature
- it has a long stretch of coastline on the eastern side of Africa. (Because cyclones move eastwards, they usually affect the eastern sides of continents)
- it is low-lying.

In addition to its geography, it is particularly vulnerable to the effects of cyclones because it is a developing country, which means:

- its population is mainly subsistence farmers. Damage to crops means loss of livelihood
- its population is poor. Informal shelters and infrastructure are more easily damaged in the storms.
- poor/no infrastructure/precaution/no evacuation programme



*How has Mozambique become better prepared for cyclones?*

After its history of cyclone disasters, particularly cyclone Eline in 2000, the country has:

- better advance warning systems
- international assistance – for example, the UN Humanitarian Country Team
- disaster relief supplies
- community training programmes – about evacuation procedure/ what to do in the case of an emergency.

*In what ways it can still improve?*

The country can still benefit from more training and development of the radio broadcasting network so that warnings are issued in all the local languages. It also needs more resources such as rescue boats.

**Activity 6** (Learner's Book, page 30)

1. a. Tanzania  
b. Malawi
2. a. Lesego, Violet  
b. Boldwin, Urilia
3. The answer for this will depend on the tropical cyclone events of the 2012/2013 summer season.

**Informal assessment**

**Activity 1**

Learners can cross-check answers with one another in this relatively simple activity.

**Activity 2**

Learners can cross-check answers with one another, to see that they have the diagrams in the correct order. If they have not answered correctly, there might be conceptual problems which you need to address.

**Activity 3**

Go through the answers with the class as the last two questions lend themselves to some group discussion.

**Activity 4**

This is a reading-based, comprehension and assessment exercise, which lends itself to group discussion of learners' answers.

**Activity 5**

Mark the mini-essays against the example answer provided. Assess both geographical and writing skills and give feedback.

**Activity 6**

This is a straightforward activity where learners can cross-check answers with one another, or you can simply provide the answers against which learners can check their answers.

### **Curriculum and Assessment Policy (CAPS) content**

#### **Subtropical anticyclones and associated weather conditions**

- Location of the high-pressure cells that affect South Africa
- General characteristics of these high-pressure cells
- Anticyclonic air circulation around South Africa, and its influence on weather and climate
- Travelling disturbances associated with anticyclonic circulation: moisture front, line thunderstorms, coastal low-pressure systems and South African berg winds
- Reading and interpreting satellite images and synoptic weather maps that illustrate weather associated with subtropical anticyclonic conditions

#### **Resources**

- Learner's Book, pages 31–40
- Websites (optional):
  - For information on climate and weather: <http://www.physicalgeography.net/fundamentals/contents.html> chapters 6 and 7 or <http://www.e-booksdirectory.com/details.php?ebook=1628>. This is a free, online text which is recommended
  - <http://www.weathersa.co.za/web/Home.asp?mw=w&f=> is the South African Weather Services's website, which is interesting with regard to regional forecasts.
- South African synoptic maps (go to the South African Weather Service's website): these are a very valuable resource for this unit, as anticyclones are virtually a permanent feature of southern Africa's weather and climate.

#### **Preparation**

- While temperate (mid-latitude) and tropical cyclones are low-pressure systems typically associated with precipitation (rainy weather), anticyclones are high-pressure systems associated with fine weather.
- Try to look at cross-sectional diagrams (three-dimensional) of the circulation in a cyclone and an anticyclone by way of preparation.
- Work out your lesson plans (see page 298 of this Teacher's Guide for assistance) for how you will go through the text and activities in Unit 3 – given the amount of classroom time you have.

#### **Teaching the unit**

- A good starting point is to refer learners to the basic differences and the atmospheric circulation associated with low- and high- pressure systems. Stress that there is no such thing as good or bad weather. For a polar bear, a hot sunny day (which should be referred to as fine weather) is not good. For a farmer needing rain, a thunderstorm is not bad, though it might be bad for a cricket match! Use terms such as fine weather (anticyclones) and severe weather (tropical cyclones) rather than good and bad.

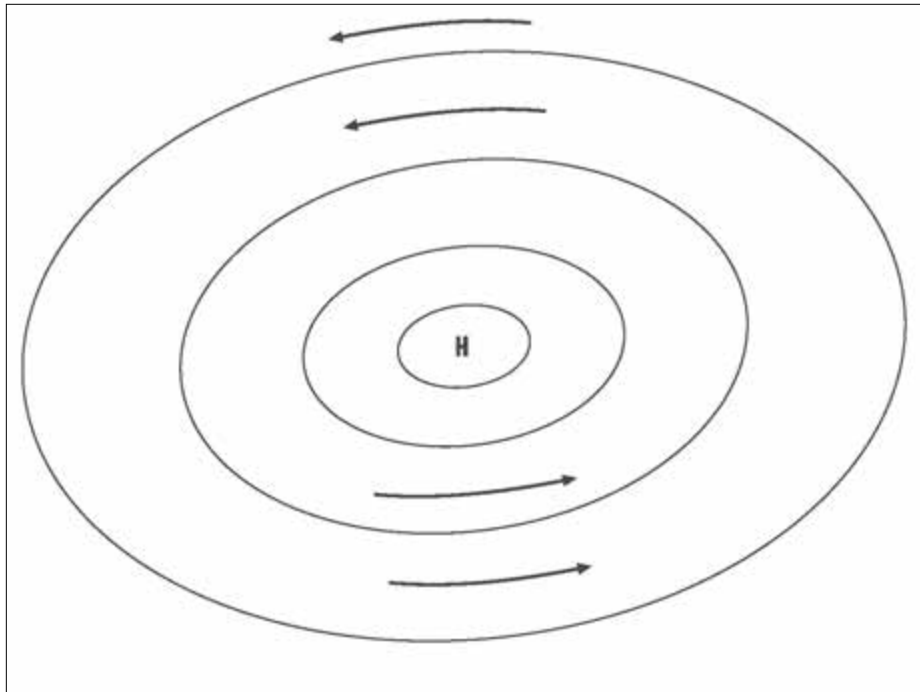
- Explain that the key issues to be addressed in this unit are:
  - What are high-pressure cells (anticyclones)?
  - Why are they often regarded as semi-permanent?
  - Which ones impact on southern African weather and climates?
  - What are their characteristics and special features?
  - How exactly does their circulation impact on our weather?
  - Which atmospheric disturbances are associated with anticyclones?
- Use the lesson ‘pattern’ of reading through the text and discussing the diagrams with learners; give input when getting them to do the activities; then take feedback; give more input.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners’ answers.

### Activity 1 (Learner’s Book, page 32)

1.



Remind learners that isobars are lines which join points of equal pressure. They show air pressure with an H to signify a high-pressure cell – where air descends; skies tend to be clear. An L signifies a low-pressure cell where air rises, and skies tend to be cloudy with bad weather.

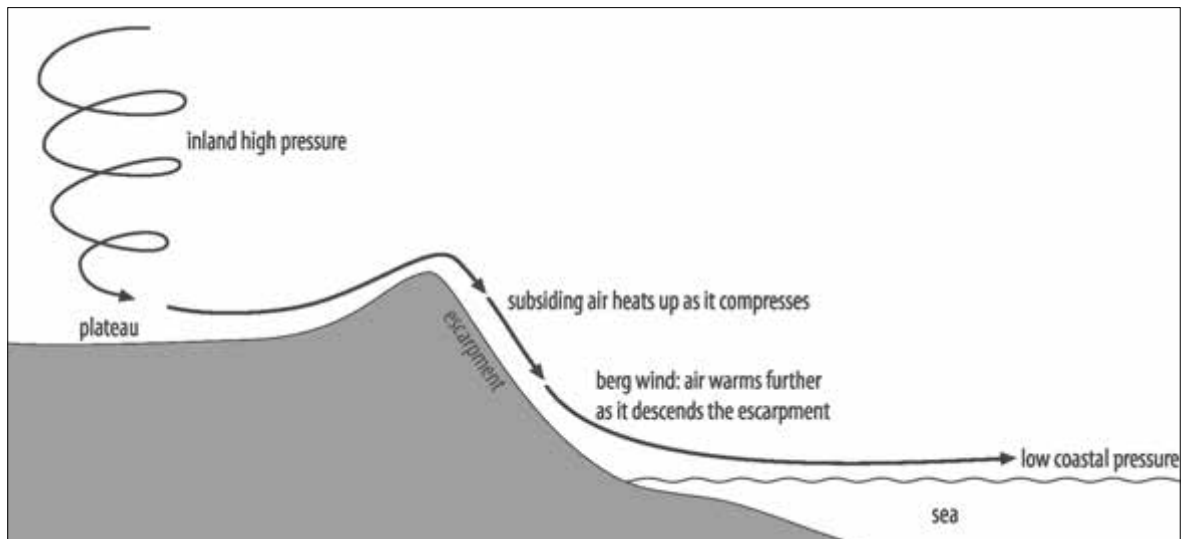
2. As a parcel of air descends/sinks, it is compressed. The air pressure increases as the air is squashed more closely together. And as the air pressure increases, the air temperature increases – this is called adiabatic warming. Air molecules come closer to the source of heat, e.g. Earth.
3. South Atlantic High; South Indian High
4. They are the opposite of low-pressure systems or tropical cyclones. (Note it is not because their winds spiral in an anticlockwise direction in the southern hemisphere; they spiral in a clockwise direction in the northern hemisphere.)

**Activity 2** (Learner's Book, page 37)

	Winter	Summer
<p><b>South Atlantic High</b> Position:</p> <p>Effect:</p>	<ul style="list-style-type: none"> <li>• closer towards land; also further north</li> <li>• can ridge behind cold fronts, pushing the fronts inland</li> </ul>	<ul style="list-style-type: none"> <li>• further out over the sea; also further south</li> <li>• onshore winds on western side</li> </ul>
<p><b>Kalahari High</b> Position:</p> <p>Effect:</p>	<ul style="list-style-type: none"> <li>• dominates the interior</li> <li>• inversion layer above level of escarpment</li> <li>• stable conditions over the interior</li> <li>• occasional berg winds near the coast</li> </ul>	<ul style="list-style-type: none"> <li>• rises vertically and so its effect disappears</li> <li>• inversion layer below level of escarpment</li> </ul>
<p><b>South Indian High</b> Position:</p> <p>Effect:</p>	<ul style="list-style-type: none"> <li>• closer towards land; also further north</li> <li>• moist NE/SE winds (but are blocked from reaching the interior)</li> </ul>	<ul style="list-style-type: none"> <li>• further out over the sea; also further south</li> <li>• moist NE/SE winds bring rain to the eastern half of the country</li> </ul>

**Activity 3** (Learner's Book, page 37)

1. A hot, dry, subsiding wind that blows down the escarpment towards the sea.
2. Kalahari High
3. For a berg wind to blow there must be a large pressure gradient between the interior and the coast. The low pressure is provided by the coastal low. Air then flows from the inland high pressure to the coastal low.
- 4.



**Activity 4** (Learner's Book, pages 39–40)

1. A = South Atlantic High; B = Kalahari High; C = South Indian High
2. A and C are further north in winter; B has risen vertically in summer because of the high summer temperatures over the interior.
3. The Western Cape and perhaps the Eastern Cape will experience cloudy conditions and rain. The interior will remain clear and dry due to the presence of the Kalahari High.

4.
  - a. moisture front
  - b. cloudy/rainy conditions in a diagonal line across the interior
5.
  - a. west to east/eastwards
  - b. summer
  - c. In summer, Kalahari High (B) lifts as temperatures rise. Cool, dry air is pushed across the interior by South Atlantic High (A). Warm, moist air from the north-east is pushed across the interior by South Indian High (C). Cool air lifts warm air. Line thunderstorms develop along the trough of low pressure of the moisture front.

## Informal assessment

### Activity 1

If possible, put the complete diagram up on an OHP or data projector so that learners can see the complete, correct answer and compare their own drawings and labels with it.

### Activity 2

This is a very straightforward activity where learners can check their own answers or work in pairs to cross-check answers.

### Activity 3

Learners should work in small groups to go through their answers and discuss, in particular, answers to question 3.

### Activity 4

This is a useful concluding activity which can provide a quantitative assessment (mini-test, with marks) for the unit as a whole. Again, it gives you an opportunity to identify potential conceptual weaknesses, and to remedy these, possibly through some re-teaching where necessary.

## Curriculum and Assessment Policy (CAPS) content

### Valley climates

- The microclimate of valleys (the effect of the slope aspect)
- Development of anabatic and katabatic winds, inversions, frost pockets and radiation fog
- The influence of local climates on human activities such as settlement and farming

### Resources

- Learner's Book, pages 41–48
- See also the websites recommended in Unit 3, though these are less useful for microclimatic work.
- Any local photos of microclimatic phenomena in your area could be very useful, for example local differences in vegetation on slopes as a result of different microclimates, or mist or smoke in valleys (temperature inversions).

## Preparation

- The emphasis changes here from regional to local conditions. Stress this to learners. Local conditions can be so strong or so influential, that they actually dominate regional conditions at certain times of the year.
- Ask learners to bring any newspaper cuttings which refer to local weather conditions (storms, flooding) as an introduction and to stimulate discussion around local climate and weather.
- Work out your lesson plans (see page 298 of this Teacher's Guide for assistance) for how you will go through the text and activities in Unit 4 – given the amount of classroom time you have.

## Teaching the unit

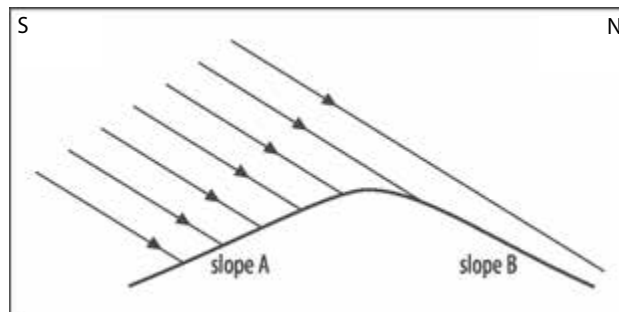
- Remember to explain to learners that the emphasis changes from regional to local conditions.
- Explain that the key issues here include:
  - How does slope aspect influence the microclimate of valleys?
  - What other factors (particularly local winds) affect the microclimates of valleys?
  - Importantly, how do local climates influence human activities?

## Answers

Use these suggested answers as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.

### Activity 1 (Learner's Book, page 42)

1. Slope A is south-facing. Because it is in the northern hemisphere, this means it receives more sunlight/warmth than slope B, which lies in the shadow zone in winter.
- 2.

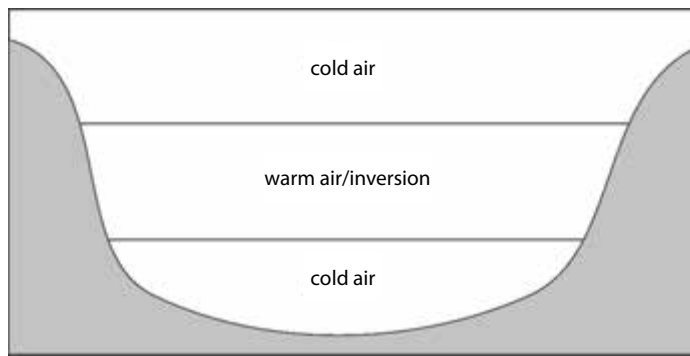


### Activity 2 (Learner's Book, page 44)

1. Air is not warmed directly by the Sun. The Sun warms the ground/Earth and the ground/Earth transfers this warmth to the air by terrestrial radiation. Some pockets of air heat up faster than others because:
  - some patches of ground heat up more rapidly and absorb more heat than others, depending on their albedo (how much sunlight they reflect) or their aspect (whether they face/lie directly in the Sun)
  - some patches of ground are high-lying, while others are low-lying (topography).
2. An anabatic wind. A paraglider takes off down the slope and it is best if he/she takes off into the wind. In other words, it is best if the wind blows up the slope.
3. An anabatic wind forms when the air above the slopes heats up faster than the air at the same height above the valley. (This is because the air above the slopes is closer to the ground.) The warm air rises up the slope.

**Activity 3** (Learner's Book, page 48)

1. Learner's drawings should look similar to this one.



2. Hillsides lie in the thermal belt – the mid-slope level/altitude at which the warm layer of air is trapped.
3. If possible, avoid the frost pockets and plant on the slopes. / Grow frost-resistant varieties of sugarcane. Make fires next to fields before sunrise to eliminate the cold.
4. If possible, introduce restrictions on wood-burning fires. / Situate factories with chimneys above the valley floor, or on the outskirts outside of the valley / hollow. Filters on chimneys of factories. / Fines by the authorities.

### Informal assessment

#### Activity 1

Learners can cross-check answers with one another, and see if their explanations for snow melt correspond.

#### Activity 2

Follow the same procedure as that for Activity 1 assessment to see if there is consensus. This activity lends itself to small group discussion and sharing of learners' answers.

#### Activity 3

A similar approach as to the previous two activities could be followed, or assessment could be undertaken via a wider discussion involving the whole class.

#### Remedial

Learners use newspaper cuttings which refer to local weather conditions (storms, flooding) to discuss their local climate and weather.

#### Extension

Learners use newspaper cuttings which refer to national weather conditions (storms, flooding) to compare their local climate and weather with that of other regions.

## Curriculum and Assessment Policy (CAPS) content

### Urban climates

- Reasons for differences between rural and urban climates
- Urban heat islands – causes and effects
- Concept of pollution domes – causes and effects
- Strategies to reduce the heat island effect

### Resources

- Learner's Book, pages 49–54
- See the websites recommended for Unit 3, although these are less useful for microclimatic work.
- If you live in a city or large town, local photos of microclimatic phenomena in your area could be very useful, for example of pollution, the effect of strong winds (in Cape Town, the South Easter sometimes forces pedestrians to hold onto objects for support; on the Highveld, dust blowing off mine dumps) or the contribution of vehicles to air pollution. Bring any photos you find to class for discussion purposes.

### Preparation

- Ensure that you are familiar with the concepts which are unique to urban climates (heat islands, pollution domes, atmospheric pollution, and smog). Urban climates are a topic and focus of ongoing studies.
- Research or think of examples of practical efforts (for example in London and Singapore) to prevent traffic entering the CBD. One reason is congestion, but an equally important one is pollution from vehicle exhausts. You can use these examples in your introduction to the unit.
- Work out your lesson plans (see page 298 of this Teacher's Guide for assistance) for how you will go through the text and activities in Unit 5 – given the amount of classroom time you have.

### Teaching the unit

- Use the examples of practical efforts to prevent traffic entering the CBD (see above) to introduce the unit. Ask learners for other examples they can think of.
- Explain that the key issues in this unit include:
  - Why do rural and urban climates often differ?
  - What are so-called urban heat islands?
  - What is the cause of urban heat islands? What are their impacts or effects?
  - What are pollution domes, and what are their causes and effects?
  - In what ways can the heat island effect be controlled or minimised?

### Answers

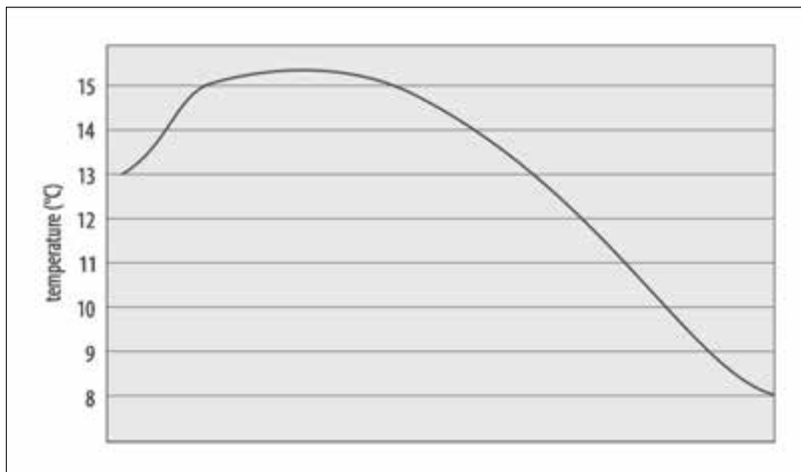
Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.



**Activity 1** (Learner's Book, page 50)

1. Tall buildings block out sunlight/put streets and pavements in shadow.
2. They absorb more heat because of the materials (such as asphalt/tarmac/and concrete) that they are built with./More combustion processes that give off heat.
3. Annual mean temperature; Winter maximum temperatures; Occurrence of frosts; Number of days with snow
4. There is more fog because there are more condensation nuclei in the air, i.e. there are more smoke or dirt particles that water vapour can stick to and condense on.
5. There are fewer trees/less plant cover or vegetation in a city than in the rural areas. This means that there is less transpiration (the process by which plants lose water through little holes in their leaves) and so there is less water vapour in the air.
6. double
7. 1 000%

**Activity 2** (Learner's Book, page 52)



**Activity 3** (Learner's Book, page 54)

1. a. Any two: corrugated sheet; red tiles; concrete; brick/ stone; tarmac  
b. highly reflective roof, white paint, corrugated iron sheet, plate glass roof  
c. Depending on the angle of the surfaces, these reflective materials can simply reflect heat onto other low albedo building surfaces that then absorb this heat.
2. Here is an example of a mini-report:

*The problem of the urban heat island effect*

As the term suggests, the urban heat island effect is the phenomenon of cities being hotter than their neighbouring rural areas. Cities not only generate their own heat when fuel is burned in factories and car engines, but they also act as heat traps. Artificial surfaces like concrete and tar absorb heat; and glass windows let short-wave radiation in, but don't let long-wave radiation (heat) out.

The effects/consequences of the urban heat island effect are the discomfort of high temperatures, the extra energy load of air conditioning, and the problem of air pollution. Air pollution in turn helps to trap heat and exacerbate the heat island effect.

#### *Guidelines or recommendations*

When planning a new building or development, it is recommended that:

- large areas of hard surfaces such as concrete are broken up/reduced in size with the planting of grass and trees
- large parking areas are shaded
- preference is given to building materials that are neither too reflective nor too absorptive
- mirror glass is avoided
- water bodies such as ponds or lakes are introduced in parks.

### **Informal assessment**

#### **Activity 1**

A large group discussion is recommended here after learners have completed the activity. There are some answers where you may need to elaborate or expand on what is provided in the memorandum above.

#### **Activity 2**

This is a fairly mechanical exercise which involves plotting a graph. Provide learners with the correct version (see above) against which they can undertake a simple self-assessment.

#### **Activity 3**

The unit concludes with a fairly comprehensive activity where a variety of geographical skills are assessed. Go through the answers carefully with the class as a whole and use this as an opportunity to assess learner's performance.

#### **Remedial**

Check that learners can answer these questions:

- Why do rural and urban climates often differ?
- What are so-called urban heat islands?
- What is the cause of urban heat islands? What are their impacts or effects?
- What are pollution domes, and what are their causes and effects?
- In what ways can the heat island effect be controlled or minimised?

Ask them to revise the sections in which they feel they need to improve.

#### **Extension**

Ask learners to go through the unit again and to draw up their own 'mini-test' which includes 10 multiple-choice questions. They can then swap their questions with a partner to do and finally, mark each other's work.

	<b>MODULE 2</b>	
<b>TERM 1</b> Learner's Book pages 55-100 Duration: 12 hours Lessons: 24 half- hour lessons, or 12 hour long lessons	<b>GEOMORPHOLOGY:</b> <b>GEOGRAPHICAL KNOWLEDGE</b>	

This module focuses on rivers as dynamic systems for moving water from land to sea. We look at the key features of a river network, what work rivers do and what landforms they make; and finally why and how we should look after our river catchments.

### **Curriculum and Assessment Policy Statement (CAPS) content**

#### **Drainage systems in South Africa**

- Important concepts: drainage basin, catchment area, river system, watershed, tributary, river mouth, source, confluence, water table, surface run-off and groundwater
- Types of rivers: permanent, periodic, episodic and exotic
- Drainage patterns: dendritic, trellis, rectangular, radial, centripetal, deranged and parallel
- Drainage density
- Use of topographic maps to identify stream order and density
- Discharge of a river: laminar and turbulent flow

#### **Fluvial processes**

- River profiles: transverse profile, longitudinal profile and their relationship to different stages of a river
- Identification and description of fluvial landforms: meanders, oxbow lakes, braided streams, floodplains, natural levees, waterfalls, rapids and deltas
- River grading
- Rejuvenation of rivers: reasons and resultant features, such as knick points, terraces and incised meanders
- River capture (stream piracy): the concepts of abstraction and river capture; features associated with river capture (captor stream, captured stream, misfit stream, elbow of capture, wind gap)
- Superimposed and antecedent drainage patterns

#### **Catchment and river management**

- Importance of managing drainage basins and catchment areas
- Impact of people on drainage basins and catchment areas
- Case study of one catchment area management strategy in South Africa

#### **Key geographical skills and techniques**

- using verbal, quantitative and symbolic data forms such as text, pictures, graph tables, diagrams and maps
- processing, interpreting and evaluating data

## Key words/concepts

drainage basin; catchment (area); river system; watershed; tributary; confluence; river mouth; source; surface run-off; groundwater; water table; baseflow; permanent river; perennial river; periodic river; episodic river; exotic river; drainage pattern; drainage density; stream; stream order; discharge; cumec; laminar flow; turbulent flow; hydrograph; lag time; fluvial; base level; longitudinal profile; transverse profile; vertical erosion; lateral erosion; fluvial landform; erosion; deposition; waterfall; rapids; alluvium; braided stream; (natural) levee; delta; distributary; meander; oxbow lake; floodplain; graded river; overgraded river; undergraded river; rejuvenation; knickpoint; (river) terrace; incised meander; river capture/stream piracy; captor stream; captured stream; abstraction; headward erosion; elbow of capture; wind gap; misfit stream; superimposed drainage pattern; antecedent drainage pattern; wetland; habitat; ecosystem

Learner's Book  
pages 56–70  
Duration: 5 hours

## UNIT 1

## Drainage systems in South Africa

TERM 1, WEEKS 4–5

### Curriculum and Assessment Policy (CAPS) content

#### Drainage systems in South Africa

- Important concepts: drainage basin, catchment area, river system, watershed, tributary, river mouth, source, confluence, water table, surface run-off and groundwater
- Types of rivers: permanent, periodic, episodic and exotic
- Drainage patterns: dendritic, trellis, rectangular, radial, centripetal, deranged and parallel
- Drainage density
- Use of topographic maps to identify stream order and density
- Discharge of a river: laminar and turbulent flow

#### Resources

- Learner's Book pages 56–70
- Academic book: Rowntree, K. 2012 Fluvial Geomorphology. In: Holmes, PJ and Meadows, ME (eds) Southern African Geomorphology. Sun Media, Bloemfontein
- Atlases or class maps
- Websites (optional):
  - For information on fluvial geomorphology:  
<http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended as a general introduction to all geomorphology)  
<http://www.geologyclass.org/Stream%20Concepts.htm>  
[http://wetlands.sanbi.org/gumboot\\_article.php?id=215](http://wetlands.sanbi.org/gumboot_article.php?id=215)  
<http://www.hartrao.ac.za/other/vredefort/vredefort.html>

## Preparation

- Read through the unit to familiarise yourself with the content. Refer back to Grades 10 and 11 where learners received a background in physical geography which underpins fluvial geomorphology.
- The text mentioned above is a brand new look at South African geomorphology. The chapter on fluvial geomorphology deals specifically with much of what is presented in this unit (and indeed this module) with good South African examples.
- Work out lesson plans (see page 298 of this Teacher's Guide for assistance) for how you will go through the text and activities in Unit 1 – given the amount of classroom time you have.

## Teaching the unit

- The unit deals with drainage systems. This implies some sort of physical system (a catchment area, which has spatial dimensions and where terms such as large or small are useful).
- Catchments also have different shapes (form or morphology). They are drained by a river and its tributaries (essentially linear features). Here, total stream length, the length of individual streams, and density (a relationship between catchment area, and total stream length) are important.
- Key issues include definitions and conceptual understanding of new and important terminology. Here are some questions that learners should be able to answer at the end of the unit:
  - What is a drainage basin or catchment area?
  - Where does the water in rivers come from?
  - Why do some drainage basins have a more extensive/denser river network than others?
  - Why do different drainage patterns develop?
  - How is stream order assigned to a river system?
  - What is discharge?
  - How do drainage density and drainage basin shape affect discharge?
  - What are laminar and turbulent flow and how do they differ?

## Answers

Below are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.

### Activity 1 (Learner's Book, page 57)

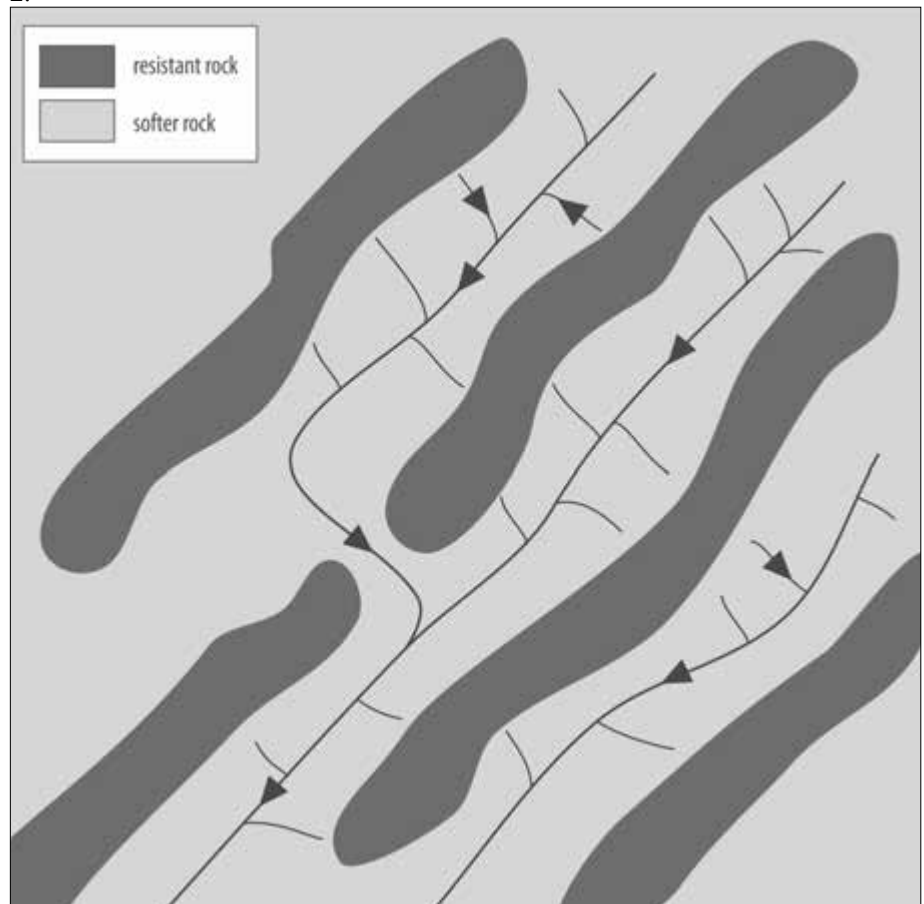
1. Orange/Gariep and Limpopo
2. watershed
3. Witwatersrand (Teacher note: Crocodile West, not Crocodile East, which is a tributary of the Komati River in Mpumalanga)
4. a. Vaal; also accept Senqu  
b. Molopo  
c. Olifants River  
d. many: Crocodile; Marico
5. Douglas
6. a. Drakensberg Mountains in Lesotho  
b. Drakensberg Mountains in Mpumalanga
7. a. Atlantic Ocean  
b. Indian Ocean

**Activity 2** (Learner's Book, page 60)

1. It matches South Africa's rainfall pattern, with high rainfall in the eastern half of the country (and along the southern coast). Therefore they are non-perennial rivers.
2.
  - a. Groundwater is water that collects underground by infiltration; baseflow is groundwater that feeds rivers.
  - b. Periodic rivers occur in semi-dry regions and flow in the rainy season; episodic rivers occur in arid regions and flow irregularly – only after very heavy rain – sometimes once in 100 years.
3. permanent river
4. episodic rivers; they are mostly dry. (Note: They are not fed by the underground water that flows in the aquifer)
5.
  - a. Molopo River
  - b. Orange River (i.e. the part of the Orange River drainage basin is in Namibia)

**Activity 3** (Learner's Book, page 62)

1. A = rectangular; B = parallel; C = trellis; D = dendritic
- 2.



The trellis drainage pattern

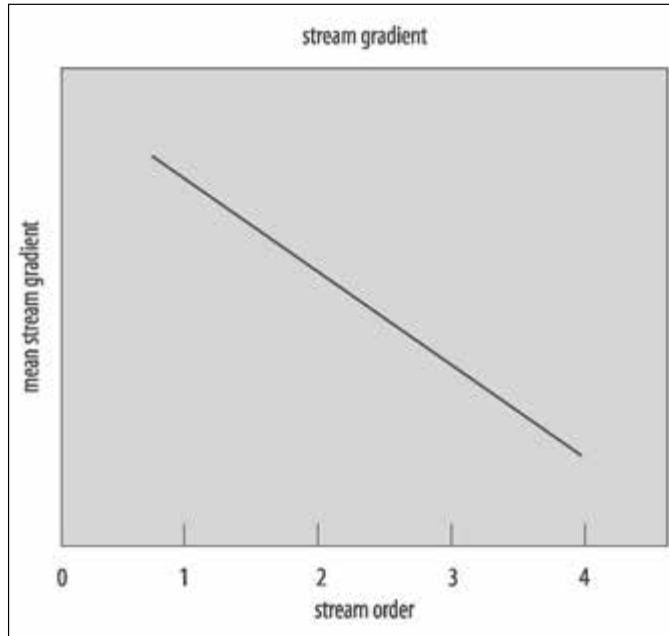
**Activity 4** (Learner's Book, page 64)

1.
  - a. The escarpment is rock, impermeable and/or has steep slopes which means run-off is generally higher.
  - b. drainage density = total length of all streams ÷ basin area  
OR  $DD = \frac{\sum(L)}{A}$  where  $L$  = length of channel or stream; and  $A$  = basin area
  - c.  $\text{km}/\text{km}^2$  (or  $\text{km} \cdot \text{km}^{-2}$ )
  - d.
    - i. coarse;  $0-2 \text{ km}/\text{km}^2$
    - ii. fine;  $2-3,5 \text{ km}/\text{km}^2$

2. a. Drainage density is length of streams per basin area, while stream frequency is number of streams per basin area.
- b. i. B
- ii. A

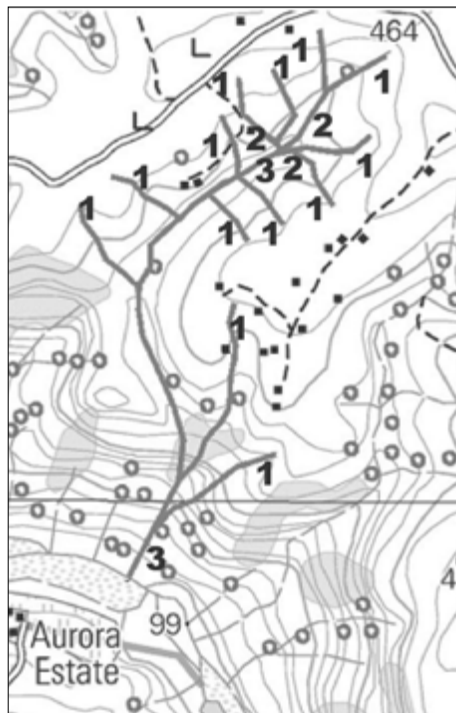
**Activity 5** (Learner's Book, page 65)

1. a. decreases
  - b. increases
  - c. larger
- 2.



**Activity 6** (Learner's Book, page 66)

1. Quadrant A or B appears to have the highest stream density.
2. Mzimkhulu River
3. There are first-, second-, and a third-order streams in this catchment. The third-order stream flows into the Mzimkhulu River.



**Activity 7** (Learner's Book, page 69)

1. a.  $0,5 \text{ m}^3$  per second or  $0,5 \text{ m}^3 \cdot \text{s}^{-1}$  ( i.e.  $1,0 \text{ m}^3 \cdot \text{s}^{-1} \times 0,5$ )  
 b.  $10 \text{ m}^3$  per second or  $10 \text{ m}^3 \cdot \text{s}^{-1}$  (i.e.  $1,0 \text{ m}^3 \cdot \text{s}^{-1} \times 10$  )  
 c.  $2,5 \text{ m}^3$  per second or  $5 \text{ m}^3 \cdot \text{s}^{-1}$  (i.e.  $1,0 \text{ m}^3 \cdot \text{s}^{-1} \times 5/2$ )
2. Discharge = width  $\times$  depth  $\times$  velocity =  $5 \text{ m} \times 2 \text{ m} \times 0,5 \text{ m} \cdot \text{s}^{-1} = 5 \text{ m}^3 \cdot \text{s}^{-1}$
3. A2; B4; C1; D3

4.

Factors affecting river discharge		
a.	drainage basin size, shape and relief	The lag time is discharge is shorter for: i. a <u>small</u> drainage basin ii. a <u>circular</u> drainage basin iii. a <u>drainage basin with steep sides</u>
b.	rock type	i. Infiltration rates are <u>high</u> in <u>porous</u> rock such as sandstone and limestone. ii. The higher the infiltration rate, the <u>lower</u> the discharge.
c.	soil type	i. Infiltration rates are <u>low</u> in clay soil. ii. Run-off rates are <u>high</u> and discharge is <u>high</u> .
d.	drainage density	The higher the drainage density, the <u>faster</u> the water reaches the river channel.
e.	precipitation	High or heavy rainfall saturates the soil and leads to <u>increased</u> discharge.
f.	temperature	Higher rates of evapotranspiration <u>reduce</u> discharge.
g.	land use	Vegetation reduces run-off. Clearing vegetation and laying of impermeable surfaces such as paving or tarred roads leads to <u>increased</u> discharge and flooding.

**Informal assessment****Activity 1**

Learners can cross-check answers with one another, or you can simply provide the answers against which learners can check their answers.

**Activity 2**

This is an activity which requires insight and the appreciation and interpretation of written material. It is suggested that learners discuss and share their contributions.

**Activity 3**

This is a fairly straightforward activity which requires identification of fluvial systems. Learners can cross-check their answers with a partner.

**Activity 4**

There is a significant amount of information in this fairly complex activity which requires both identification and comparison of visual representations of river drainage. It is suggested that you go through the answers with learners, and identify any problem areas in terms of conceptual understanding.

**Activity 5**

Answers can be cross-checked in pairs, or in small group discussion.



### Activity 6

Answers can be cross-checked by pairs of learners.

### Activity 7

This is another fairly complex activity which requires conceptual understanding, three dimensional thinking, and some calculations based on time and volume. It is suggested that you provide definitive answers to which learners can compare their calculations.

### Remedial

- Ask learners to put the correct names next to these stream patterns:
  - Looks like a tree (Answer: dendritic)
  - Looks like burglar bars (Answer: trellis)
  - Looks like a grid (Answer: rectangular)
  - Looks like a star (Answer: radial)
  - Looks like the spokes of a wheel (Answer: centripetal )
  - Looks like someone gone mad Answer: deranged)
- Ask learners to copy the diagrams in Figure 2.1.7 on page 61 and to put in arrows to show the direction of stream flow.

### Extension

Ask learners to complete the stream order and to draw a diagram to show the stream ordering system:

$$1 + 1 = 2$$

$$2 + 1 = 2$$

$$2 + 2 = 3$$

$$3 + 1 = 3$$

$$3 + 2 = 3$$

$$3 + 3 = 4$$

## Curriculum and Assessment Policy (CAPS) content

### Fluvial processes

- River profiles: transverse profile, longitudinal profile and their relationship to different stages of a river
- Identification and description of fluvial landforms: meanders, oxbow lakes, braided streams, floodplains, natural levees, waterfalls, rapids and deltas
- River grading
- Rejuvenation of rivers: reasons and resultant features, such as knick points, terraces and incised meanders
- River capture (stream piracy): the concepts of abstraction and river capture; features associated with river capture (captor stream, captured stream, misfit stream, elbow of capture, wind gap)
- Superimposed and antecedent drainage patterns

## Resources

- Learner's Book, pages 71–91
- Academic book: Rowntree K. 2012 Fluvial Geomorphology. In: Holmes, PJ and Meadows, ME (eds) Southern African Geomorphology. Sun Media, Bloemfontein
- Website (optional):  
For information on fluvial geomorphology in general:  
<http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)

## Preparation

- As with Unit 1, read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules, as this skills development module requires a theoretical background in physical geography.
- The website mentioned above is also highly recommended.
- Work out lesson plans (see page 298 of this Teacher Guide's for assistance) for how you will go through the text and activities in Unit 2 – given the amount of classroom time you have.

## Teaching the unit

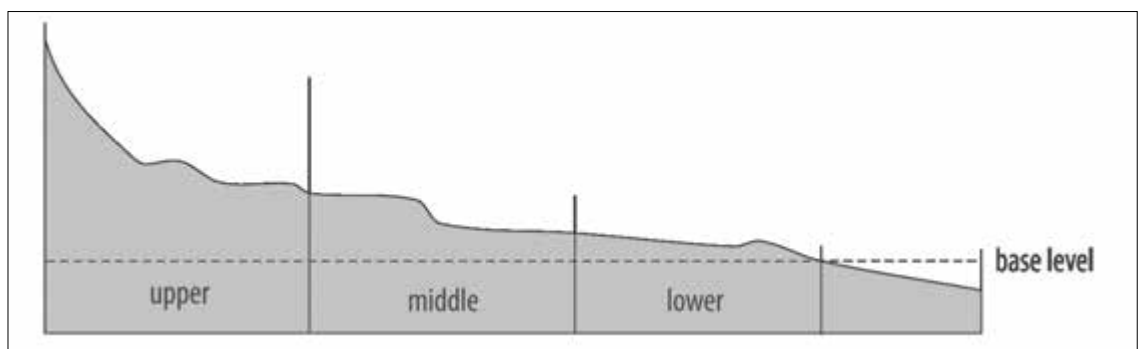
Explain the following to learners:

- In Unit 1, the emphasis was on fluvial systems. The basics of this are the river system itself and the catchment – the area where water, typically precipitation but also groundwater, is 'caught' and delivered to a river via its tributaries or via through-flow.
- We looked at the morphology (form) of catchments and rivers in detail. This included typical fluvial landforms associated with a river and its catchment.
- In this unit, the emphasis is far more on fluvial processes. A process implies a dynamic interaction of forces within a (fluvial) system. This in turn results in the formation of further landforms associated with erosion, transportation or deposition within the catchment.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.

### Activity 1 (Learner's Book, page 72)



**Activity 2** (Learner's Book, page 76)

1. A waterfall is the flow of water over an erosion-resistant cliff; the flow of water is more vertical than horizontal. Rapids are a section of a river where the gradient is steep and bumpy and the flow is fast and rough; the flow of water is more horizontal than vertical.  
A waterfall forms where there is a sudden break in elevation – usually where hard rock and softer rock meet and the softer rock has been worn away faster. Rapids form where the water channel becomes narrower or steeper, or where the river bed erodes unevenly, or where heavy erosion of the channel sides clutters the river with rocks.
2.
  - a. cataract – a sudden rush of water, or a large waterfall
  - b. plunge pool – a deep basin dug out or excavated at the foot of a waterfall by the action of falling
  - c. waterfall retreat – the process of a waterfall slowly moving back/upstream each time the cliff is undercut (eroded at its base) and then collapsing
3. It is difficult to classify the waterfalls precisely, so in most cases, two answers or options are acceptable:
  - Tugela Falls = tiered (it can also be classified as a cascade, although an example of a cascade is not given in Figure 2.2.9)
  - Howick Falls = horsetail or plunge
  - Mac Mac Falls = plunge or segmented (although strictly speaking the water separates before it descends)
  - Augrabies Falls = punchbowl or block (it can also be classified as a cataract, although an example of a cataract is not given in Figure 2.2.9)

**Activity 3** (Learner's Book, page 83)

1.
  - a. braided stream – a river or section of river that has split into channels around islands or sandbars of sediment deposits
  - b. delta – a large accumulation of sediment at a river's mouth, usually causing the river to split into channels as it empties into the sea
  - c. meander – a loop in a winding river
  - d. oxbow lake – a banana-shaped lake/a meander that has become separated from its river
  - e. floodplain – the flat-lying area that is frequently flooded by a river when it overflows its banks
  - f. levee – a mound of sediment that accumulates on the river bank of the floodplain when the river floods
2. from upper course to lower course: braided stream; meander & oxbow lake; floodplain & levee; delta
3. Meanders wander from side to side as the meanders (or loops) become wider. Lateral (sideways) erosion of the river channel as the meanders change their position widens the floodplain or valley.
4. Refer learners to Figure 2.2.21 on page 82 of the Learner's Book. Ask them to show you where the meander loop has recently been cut off and where the next oxbow lake is likely to form (answer: at the tightest loop at the bottom).

**Activity 4** (Learner's Book, page 84)

1.
  - a. B
  - b. A

**Activity 5** (Learner's Book, page 86)

1. The Collywobbles are a series of incised meanders, formed by rejuvenation of the Mbashe River. Vertical erosion took place before the river could change its meandering course, cutting the twists and turns deep into the landscape.
2. Uplift has lowered the sea level, which is the base level of the river. The lowering of base level has given the river new eroding power. (The uplift is due either to an upwelling of unusually hot magma beneath southern and eastern Africa or erosion of the Great Escarpment.)
3. See Figure 2.2.26 on page 85 of the Learner's Book.

**Activity 6** (Learner's Book, page 89)

1. where the captured stream used to flow; wind gap – a dry valley with gravel deposits
2. elbow of capture
3. Sundays River
4. a. It carries too little water for the size of the valley/channel it has eroded.  
b. Kouga River
5. Gamtoos River

**Activity 7** (Learner's Book, page 91)

1. superimposed
2. rejuvenation

## Informal assessment

### Activity 1

This is a straightforward drawing exercise. You can provide the definitive diagram against which learners can compare their drawings.

### Activity 2

Small group discussion will be the best way to assess learners' answers as the activity comprises a variety of questions, testing conceptual and comparative aspects of fluvial landforms, in particular waterfalls and rapids.

### Activity 3

As with the previous activity, small group discussion will be the best way to assess learners' answers as the activity comprises a variety of questions, testing conceptual and comparative aspects of fluvial landforms, this time with reference to stream patterns.

### Activity 4

This is a straightforward activity to which the teacher can provide the answers, but can also elicit some discussion on why learners have identified an overgraded and undergraded stream.

### Activity 5

This is a complex activity which depends on an understanding of dynamic processes including uplift (tectonics) and incision of rivers. You should take the time to go through these processes and ensure that learners have grasped the reasons as to why rivers incise.

### Activity 6

The same applies as to Activity 5. You should take the time to go through the rather complex set of geomorphic events, over long periods of time, which result in river capture and misfit streams.

### Activity 7

See the previous activity. This activity simply builds on the previous one, and brings the unit to a conclusion. You can use the opportunity to assess the general level of understanding in the class with some questions based on fluvial processes.

Learner's Book  
pages 92–100  
Duration: 3 hours

## UNIT 3

## Catchment and river management

TERM 1, WEEKS 6–7

### Curriculum and Assessment Policy (CAPS) content

#### Catchment and river management

- Importance of managing drainage basins and catchment areas
- Impact of people on drainage basins and catchment areas
- Case study of one catchment area management strategy in South Africa

#### Resources

- Learner's Book pages 92–100
- Academic book: Garland GG and Holmes PJ 2012. Applied Geomorphology. In: Holmes, PJ and Meadows, ME (eds) Southern African Geomorphology. Sun Media, Bloemfontein
- Websites (optional):
  - For information on fluvial geomorphology in general:  
<http://www.physicalgeography.net/fundamentals/contents.html>  
(highly recommended)
  - It is also strongly recommended that the Department of Water Affairs (DWAF) website (<http://www.dwaf.gov.za>) be visited for information on a variety of projects, as well as useful documents and information on catchments and catchment management in South Africa.

#### Preparation

- Read through the unit to familiarise yourself with the content.
- Catchment and river management builds on the previous two units. It is the applied side of fluvial geomorphology.
- If possible, go onto the DWAF website before you teach the unit. This will help you understand the current state of South Africa's rivers and catchments, and the issues surrounding catchment and river management.
- Work out lesson plans (see page 298 of this Teacher's Guide for assistance) for how you will go through the text and activities in Unit 3 – given the amount of classroom time you have.

#### Teaching the unit

Explain to learners:

- In Units 1 and 2 the emphasis was on fluvial systems, landforms and processes. Here, the emphasis is on exploitation (a slightly harsher word than use) of water resources in a dry country, namely South Africa.

- We have to use our water resources to survive and prosper. At the same time, if they are not properly managed, they will be damaged, or parts of these vital systems will even be destroyed.
- Encourage debate and a consideration of all the facts and viewpoints (the farmer, the industrialist, the environmental conservationist, and the people who live in rural and urban areas) around water, its 'ownership' and the proper management of rivers and their catchments. You could do a role-play with different learners taking on the above roles and expressing their water needs and conservation strategies.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.

### Activity 1 (Learner's Book, page 95)

- e.g. if you live in Johannesburg, the Upper Vaal (WMA 6)
  - e.g. if you live in Johannesburg, the Vaal (WMA 5)
- Department of Water Affairs, Department of Environmental Affairs and the Water Research Commission
  - making sure that good quality water is available not only now, but also in the future
  - agriculture – farmer/co-op/export fruit company
    - industry – business managers/executives/company shareholders
    - domestic use – a home resident/anyone or everyone
    - hydroelectric power – Eskom/electricity users
    - recreation – fishermen, anyone who spends recreation time in or on the banks of a river
  - Riparian Vegetation Index
    - Index of Habitat Integrity
  - biodiversity and integrity largely intact; some human-related disturbance but ecosystems are essentially in a good state (according to the Ecostatus/River Health Category table on page 95)
    - It is a river with conservation value that should be protected and maintained in a 'Natural' or 'Good' river category state (see the Ecological Importance and Sensitivity table on page 95).

### Activity 2 (Learner's Book, page 97)

- Fair to Poor
  - Poor to Seriously modified
  - Fair
- The upper reaches of the Mthatha River are polluted by commercial forestry activities. Any chemical spills or discharges from the timber factories/saw mills flow into the river. The middle reaches of the river flow through Mthatha town. Here, the main sources of pollution are discharge of untreated or inadequately-treated sewage, and littering. Informal settlements located on or near the river exacerbate the problem. The use of the river for domestic purposes such as washing of clothes, ablutions and stock-watering contributes to pollution. While chemical contaminants can lead to chronic illnesses such as cancer, pathogens from urine or faecal matter cause diseases such as cholera, typhoid and dysentery.

3. The Ngqungqu River, a tributary, which doesn't flow through an urban area, adds/introduces better-quality/cleaner water to the Mthatha River. Downstream of the confluence, rural settlements do not affect the water quality as much as Mthatha town.
4. Hydroelectricity changes the flow of water downstream. For example, in the case of the Mthatha River, this effect is carried all the way to the estuary at the Mthatha River mouth. The changes in freshwater inflows from the river affect the salinity (saltwater content) of the estuary. Other effects include:
  - scouring of river beds and erosion of riverbanks because of the force of the water exiting the turbines
  - harm to fish and other water animals because of changes in water temperature and dissolved oxygen.

**Activity 3** (Learner's Book, page 100)

1.
  - a. over-abstraction – taking/drawing too much water
  - b. eutrophication – nutrient pollution of water. Eutrophication leads to the uncontrolled growth of algae. The algae block out the sunlight and when they die, the decomposition process uses up the oxygen in the water, suffocating fish, in other words, too little oxygen
  - c. river morphology – the shape of river channels and how they change over time
  - d. estuary – a partly cut-off/enclosed coastal body of water connected to one or more rivers and the sea. An estuary is a transition zone between a river and the sea – it is fed by both freshwater and saltwater. Estuaries are important habitats for plants and animals. They support a large variety of species and often serve as fish nurseries.
2. The Breede-Overberg catchment area covers the southernmost corner of South Africa. It is a relatively small area, dominated by the large Breede River. It includes coastal rivers, estuaries and wetlands. Its land surface consists of mountain ranges, wide valleys and rolling hills. It is an important agricultural area. The coastal regions are home to residents, holidaymakers and tourists. The De Hoop Nature Reserve falls within this area.
3. The Working for Water programme (WfW) spearheads the control of water-thirsty alien plants. The programme involves clearing river basins of aliens and provides jobs for local communities.
4.
  - a. 'Water quality management (water quality is an important aspect of groundwater protection) and 'Catchment and land use management' (land use strongly impacts on groundwater quality)
  - b. Strategic Area 3: Co-operating
  - c. Compliance refers to the regulatory aspects of catchment management. It means making sure that policy is carried out and enforced.
  - d. for example, by continued monitoring of water quality and use; by imposing fines and forfeits on those who don't follow the rules/comply; by creating public awareness; by developing agreements and protocols/procedures with relevant groups such as municipalities, forums or boards, and the police
  - e. Strategic Area 2 (Fig. 2.3.11 on p. 99): Sharing

5. Arguments for protection include:
- As humans, we are custodians of our wildlife and environment.
  - We are part of the ecosystem, which depends on life in our rivers and good water quality.
  - Protection and proper management ensure that resources are preserved for the future (don't kill the goose that lays the golden egg).

Arguments for development include:

- South Africa needs development for poverty alleviation.
- Water is a vital resource.
- The environment and its resources are there to be used.

## **Informal assessment**

### **Activity 1**

This activity is quite long, and involves reading information, making judgment calls, and forming opinions based on certain information. It is very important that learners realise that there are not always right or wrong answers, particularly with respect to environmental issues, such as river and catchment management. Encourage open discussion, and tolerance for the other person's point of view.

### **Activity 2**

Learners can read one another's reports, and discuss these and the other answers in small groups.

### **Activity 3**

The activity is itself discussion-based, so the informal assessment is integral to the exercise.

### **Remedial/Extension**

Provide learners with the Geomorphology section of past national Geography examination papers to complete. Go through answers together.



	<b>MODULE 3</b>	
<b>TERM 1</b> Learner's Book pages 101–150 Duration: 7 hours Lessons: 14 half-hour lessons, or 7 hour long lessons	<b>CLIMATOLOGY AND  GEOMORPHOLOGY: GEOGRAPHICAL  SKILLS AND TECHNIQUES</b>	

This module focuses on geographical skills and techniques related to climatology and geomorphology. Topographic maps and aerial photos show many different landform features. Geographical Information Systems (GISs) allow us to zoom in on landform features and view them at high resolution.

### **Curriculum and Assessment Policy Statement (CAPS) content**

#### **Mapwork techniques**

- Reading and interpreting synoptic weather maps, satellite images and other weather- and climate-related data
- Map and photo interpretation – includes reading and analysis of physical and constructed features
- Applying map-reading skills to maps and photos

#### **Topographic maps**

- Contours and landforms
- Cross-sections
- Direction: magnetic north, true north and magnetic declination
- Gradient
- Intervisibility and grid referencing

#### **Aerial photos and orthophoto maps**

- Interpreting vertical aerial photos
- Orthophoto maps – identifying features
- Comparing an orthophoto map with a topographic map

#### **Geographical Information Systems (GIS)**

- Examination of GIS information for different catchment areas
- Developing a 'paper GIS' from existing maps, photos or other records on tracing paper

#### **Key geographical skills and techniques**

- reading and interpreting synoptic weather maps
- identifying and interpreting physical features on topographic maps
- developing skills related to measurement on topographical maps
- interpreting comparative information from aerial photographs, orthophoto maps and topographic maps
- understanding and applying basic principles of GIS analysis using a paper model

#### **Key words/concepts**

aerial photograph; contour line; cross-section; frontal system (cold, warm); geomorphic features; GIS; gradient; grid reference; intervisibility; landforms; landscapes; magnetic declination; orthophoto map; raster data; relief; spatial data; synoptic map; topographical map; vector data; weather map

## Curriculum and Assessment Policy (CAPS) content

### Mapwork techniques

- Reading and interpreting synoptic weather maps, satellite images and other weather- and climate-related data
- Map and photo interpretation – includes reading and analysis of physical and constructed features
- Applying map-reading skills to maps and photos

### Resources

- Learner's Book pages 102–117
- Websites (optional):
  - For information on synoptic charts: <http://www.weatherphotos.co.za>
  - For information on topographic maps: [http://en.wikipedia.org/wiki/Topographic\\_map](http://en.wikipedia.org/wiki/Topographic_map) and <http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)

### Preparation

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules as this skills development module requires a theoretical background in physical geography.
- Refer back to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this module builds. Much of the work is an expansion and consolidation of work done in Grades 10 and 11, with some new concepts and more advanced interpretations being introduced.

## Teaching the unit



### Lesson 1

- Start by asking learners what they know about climate, weather, weather systems and patterns.
- Explain that the lesson deals with the use of mapwork techniques and skills with regard to climatology. You will look at synoptic weather maps and how they are used to describe and interpret (which leads to forecasting) weather patterns. You will also look at satellite imagery, used in conjunction with synoptic weather maps. Concepts such as isobars, weather features and systems (cells, fronts) and symbolic representation of weather data will be dealt with.
- Provide a brief summary of the following: South Africa's rainfall regions; the influence of high altitudes in the interior; and the fact that (cold) frontal systems move from west to east across the subcontinent.
- Work through the section, 'How do you read and interpret synoptic weather maps, satellite images and other weather- and climate-related data?' (page 102 in the Learner's Book).
- Read the introduction to the section, 'How do you interpret the data on maps and photographs?' (page 107 in the Learner's Book).

- Explain that the term ‘perfect storm’ means all circumstances coming together to create a situation where something extreme will happen.

### Activity 1

- Explain that this ‘perfect storm’ happened during the week 11–17 July 2012, when upper atmosphere conditions over South Africa, combined with a very strong cold front, produced exceptionally cold conditions, and widespread, heavy snow over large parts of the eastern interior and the Karoo.
- Learners must read the extracts from the South African Weather Services advisory. Then define a cut-off low and a cold frontal system, in preparation for reading the map and satellite-based questions which follow.



## Lesson 2

- The lesson deals with map and photo interpretation, and the application of map-reading and photo-interpretation skills.
- Remind learners that map reading and interpretation, and the use of photos, are essential to geography in general, and physical geography in particular.
- The use of synoptic weather maps and satellite imagery has already been dealt with. Here, the focus is on maps and photos, particularly with geomorphic applications.
- Read through the section, ‘Apply map-reading skills to maps and photographs: climatology’ (pages 109–112) with learners.

### Activity 2

- Learners answer the map and satellite-based questions.
- Topographic maps are dealt with in the next unit, so the emphasis here is on other different types of maps, such as geological maps, speciality maps, and maps in atlases.
- Read through the section, ‘Apply map-reading skills to maps and photographs: geomorphology’ (pages 112–115) with learners.
- Vertical aerial photos and horizontal-view photos are introduced. Oblique aerial photos will receive more attention in a following unit.

### Activity 3

- The activity deals with photo interpretation, and refers back to one of the speciality maps.
- Learners are introduced to a vertical aerial photo, as well as to a number of horizontal photos dealing with geomorphological issues.
- Stress that looking at, or reading a photo (identifying features on a photo), are one part of the skill, but interpretation of information (powers of deduction) is just as important.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners’ answers.

### Activity 1 (Learner’s Book, page 107)

1. A situation where all circumstances combine to produce an exceptional phenomena. It does not always apply literally to a storm, but it can, if all the weather conditions are just right to produce an exceptional weather event.

2. a. A cut-off low-pressure system is a low-pressure system which has been separated from the upper-air westerly airstreams which should drive the system eastwards. It is often blocked by a blocking high, which stops it moving eastward. The result is uplift of moisture, and heavy rain from the stationary system.
- b. A cold front is the dividing plane between warm air (in front of the front) and cold air (behind the front). Warm in front of the front is forced to rise, and condensation and precipitation can take place. As the cold air behind the front moves over a locality, the air temperatures will drop, often dramatically.
3. The correct date order of the images in Figure 3.1.6 is: E; C; A; B; D; F. Yes, the weather pattern did follow the forecast as can be seen from the images and the synoptic weather maps.

**Activity 2** (Learner's Book, page 112)

1. cold front
2. low-pressure system
3. Learners can choose any four stations, north and south of the Vaal River. When calculating an average maximum temperature, they will see a dramatic (about 10 degree) difference between stations ahead, and stations behind the cold front.
4. Because of a dramatic drop in temperature, freezing levels are at a lower altitude and clouds comprise ice crystals, rather than water droplets. There was enough moisture coupled with very low temperatures to ensure snow, rather than rain in some places.
5. The systems have moved eastwards, so the front is passing, and the Atlantic high-pressure system (associated with fine weather) will displace the wet or snowy conditions.
6. Bloemfontein Friday 14 and –1, Saturday 6 and –3, and Sunday 12 and –1. As the front passed over, Bloemfontein's maximum temperature dropped sharply, but recovered somewhat on the Sunday as the front moved on.
7. very low minimum (and maximum) temperatures over South Africa

**Activity 3** (Learner's Book, page 116)

1. a. because the butte appears in profile (seen from the side)
- b. to show the different slope elements, or sections, of the butte
- c. This is a landform of erosion.
- d. The length of the slope segments can be measured; the steepness of the segments can be measured; and changes in geology can be observed.
- e. because, as distance from the camera increases, things become smaller, so the scale is only accurate when applied to the foreground
2. a. both: the beach is a natural physical feature, the buildings (house) are constructed, and the measures put in place to control erosion are constructed features
- b. The destruction is caused by wave erosion on the beach. Proof: sandbags that support the wall.
- c. This is a geomorphologically dynamic environment, as can be seen from the state of destruction (wave erosion) which has taken place.
- d. Yes. Humans have built the blue gabion-sandbag structures to protect further erosion in front of the houses
3. a. A – vertical aerial photo; B – high-angle oblique aerial photos
- b. About eight large pans and a few small ones occur in the photo.
- c. the name of a pan: Sunnyside Pan, which can be located on the map
- d. No, because we can't see the third dimension from this angle.

- e. horizontal
- f. A pan. The shape is shown in the vertical aerial photo
- g. Yes, you can see the undulating relief on the photo.
- h. A is a sand dune to the south-east of the pan – sand has been blown out of the pan, and B is the pan floor.

### Informal assessment

#### Activity 1

Learners should check their own answers in a class discussion, led by you, around the interpretation of the synoptic weather maps and satellite images, and against the answers provided above. Check that all learners understand the concepts covered.

#### Activity 2

Supply the correct answers (see above) and discuss these with the class. If there are conceptual problems (how and why cold fronts move, how and why temperatures drop) then return to the theory and re-explain this section to the learners.

#### Activity 3

Learners work in pairs to assess their answers against the answers you provide. As with Activity 1, this activity lends itself to input from the class.

#### Remedial

Learners who have not mastered the interpretation of synoptic weather maps and weather images should refer back to the theory and be reminded of basics around:

- high- and low-pressure systems
- frontal systems and temperate cyclones
- summer and winter weather over southern Africa
- dominant wind directions, particularly the westerlies.

With regard to geomorphology, help learners understand how to recognise common landforms and the reasons for their existence.

#### Extension

Interested learners can refer to Professor Kobus Botha's excellent website which carries a comprehensive range of images and information, updated on a daily basis: <http://www.weatherphotos.co.za>.

### Curriculum and Assessment Policy Statement (CAPS) content

#### Topographic maps

- Contours and landforms
- Cross-sections
- Direction: magnetic north, true north and magnetic declination
- Gradient
- Intervisibility
- Grid referencing

#### Resources

- Learner's Book pages 118–132
- Websites (optional):
  - For information on topographic maps: [http://en.wikipedia.org/wiki/Topographic\\_map](http://en.wikipedia.org/wiki/Topographic_map)
  - <http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)
- Topographic maps in electronic format (tiff files) may be requested from: Rural Development and Land Reform. Email: [CWalker@ruraldevelopment.gov.za](mailto:CWalker@ruraldevelopment.gov.za).

### Preparation

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules, as this skills development module requires a theoretical background in physical geography.
- The last website listed above is highly recommended.
- Refer back to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this module builds.

### Teaching the unit



#### Lesson 1

- Emphasise from the start that a topographic map and contour maps are not one and the same thing. Topography refers to physical and human features or elements on the landscape. However, topographic maps traditionally show contours, which are the lines used to join, and therefore represent, points of equal height.
- There are many other aspects of topographic maps which must be considered if we are to gain full advantage from the information on these maps.
- Remind learners that topographic maps are usually constructed to a scale of 1:50 000, and that (on South African maps) the contour interval is 20 metres.
- Go through the sections, 'What are contours and landforms' (pages 118–122; and 'What are cross-sections?' (pages 123–124) with learners.
- Direction is an important aspect of topographic maps, and is dealt with in this lesson. Grid referencing (Cartesian or map coordinates, which allow a position on a topographic map to be pinpointed) are also dealt with.
- Go through the section, 'How do you use a map and a compass to find your direction?' (pages 125–126).

#### Activity 1

- This activity involves navigation on a map. This includes both distances and directions. Distance relies on scale; direction relies on compass bearings.
- Explain that miscalculating either can have serious consequences (getting lost, running out of fuel or water).



#### Lesson 2

- This lesson concentrates on the third dimension, height. Maps (which we usually read on a computer screen, or from a sheet of paper, are two-dimensional.

- The third dimension (height) is read from contour lines or spot heights. However, various other tools or methodologies are available to interpret these height differences.
- These include gradient, intervisibility, and vertical exaggeration (used to emphasise the height dimension when it is not readily apparent).
- The way in which the same information appears in different forms on topographic maps and photos also receives attention.
- Go through pages 127–128 of the Learner’s Book with learners.

### Activity 2

- This activity involves gradient calculations.
- Distance and height are taken into account.
- Height (altitude) is read off in real terms from the contours.
- Real distance has to be calculated using the map scale.

### Activity 3

- This activity involves interpreting aspects of slope as a physical feature from photos.
- The concept of gradient in terms of degrees ( $^{\circ}$ ) is important.
- A  $90^{\circ}$  slope is a sheer cliff, a  $0^{\circ}$  slope (or  $180^{\circ}$ ) is a flat surface, a typical pitched roof (on which you can’t walk standing upright) is about  $45^{\circ}$ .
- Go through the section, ‘What is intervisibility?’ (page 130) with learners.
- Explain that cross-sections are used to determine intervisibility.

### Activity 4

- This activity deals with intervisibility. The basic question is, can point X be seen from point Y?
- Go through the section, ‘What is vertical exaggeration?’ (page 131) with learners.
- Explain that in mapwork, ‘identifying’ means recognising; and ‘interpreting’ involves actually dealing with information which is ‘built into’ or contained in a map.

### Activity 5

- This activity involves interpretation of topographic map features.
- Remind learners that map symbols assist them in identifying and interpreting map features.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners’ answers.

### Activity 1 (Learner’s Book, page 126)

1. Present declination is  $21^{\circ}$ W, so this must be added to each true compass bearing:  
 From A to B: true bearing is  $70^{\circ} + 21^{\circ} = 91^{\circ}$  distance is 10,5 km  
 From B to C: true bearing is  $342^{\circ} + 21^{\circ} = 3^{\circ}$  distance is 9 km  
 From C to D: true bearing is  $235^{\circ} + 21^{\circ} = 256^{\circ}$  distance is 7,5 km.  
 Total distance is 27 km. The hike will take 6,75 hours. This is 6 hours 45 minutes, plus the 30 minutes for lunch = 7 hours and 15 minutes.  
 (Allow an error of  $3^{\circ}$  and a distance error of 0,5 km in the calculations above.)

**Activity 2** (Learner's Book, page 129)

The height difference between Leeuberg and Paradys is 1 603,8 m – 1 421,8 m = 182 m

The horizontal distance between Leeuberg and Paradys is 8,2 km, which is 4,1 km or 4 100 m

$$\begin{aligned}\text{Gradient} &= \frac{VI}{HD} \\ &= \frac{182}{4\,100} \\ &= 22,52\end{aligned}$$

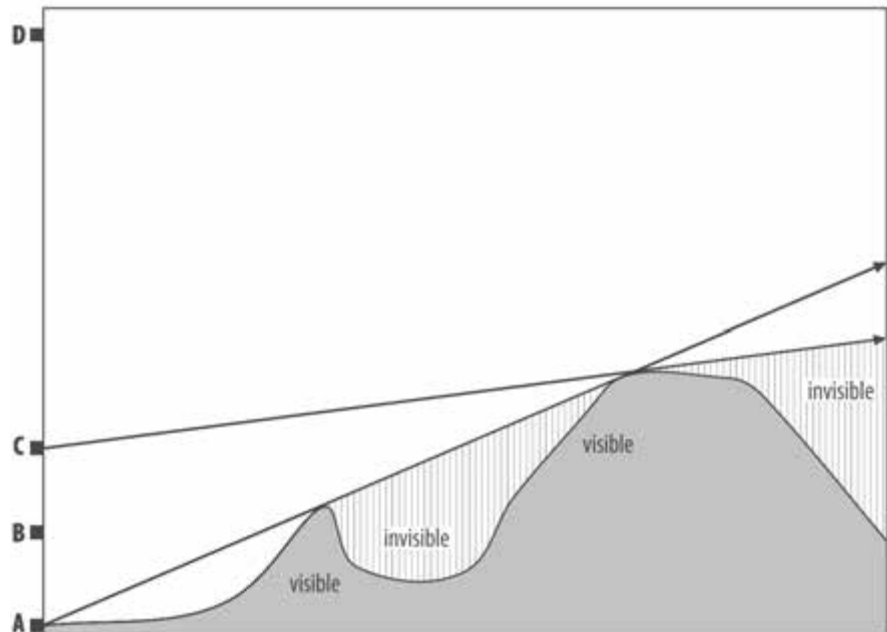
Rounded off: 1:23 or 1 in 23 (for every 23 m you move, you will gain or lose 1 m in altitude)

**Activity 3** (Learner's Book, page 129)

- B C D E F A
  - F is a mountain range or mountain: steep gradients
  - Howick Falls or Howick Gorge
  - Advantage: Great view across the gorge, with the town and the mountains in the background  
Disadvantage: Steep slopes are sometimes unstable (landslides)
- A: 90°; B: 20°; C: 5°; D: 25°; E: 50°
- E: 70°; B: 65°; D: 20°; C: 0°; A: 5°

**Activity 4** (Learner's Book, page 130)

1.



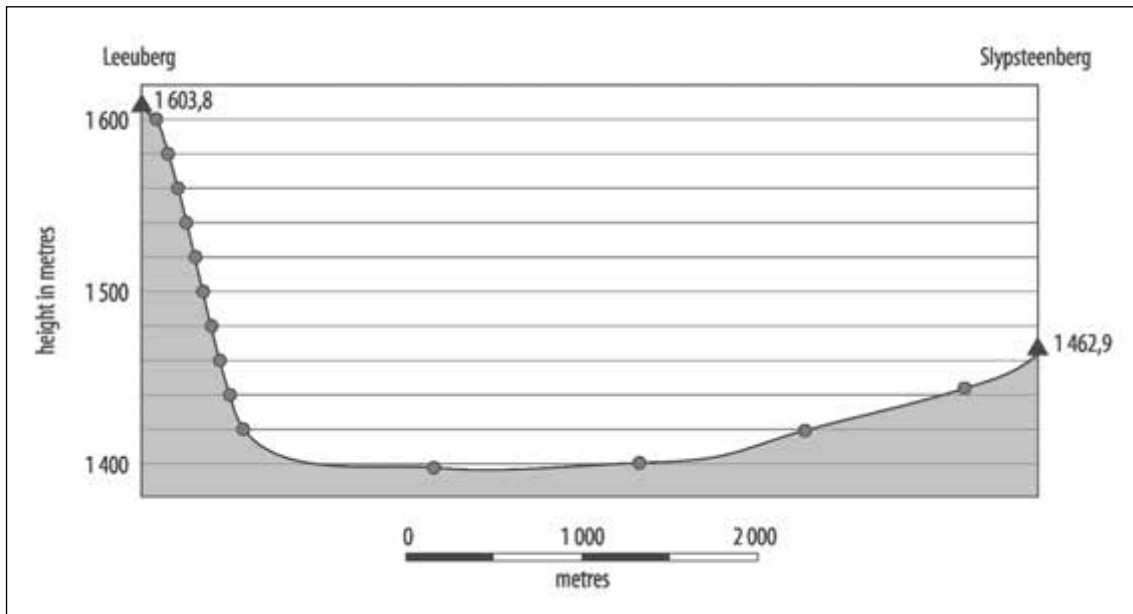
- The arrows on the diagram show what is visible, and what is not from the observation points A, C and D (B was shown as the original example in the Learner's Book). As a rule, intervisibility increases with an increase in altitude.

**Activity 5** (Learner's Book, page 131)

- Leeuberg: E2
- 1 400 m: A4; A5



3.



4. Accept any of the following: butte, koppie, conical hill, small mesa
5. slightly concave (contours become further apart at the base of the slope)
6. plain, because it is relatively low-lying and flat
7. east to west: the walls of all the small dams are on the western side
8. Yes, there is probably a dry season, as there are windmills, dams and irrigation canals indicated.

### Informal assessment

#### Activity 1

This, and the activities which follow, largely comprise calculations with precise answers. Give these answers to learners so that they can check and correct their calculations if necessary. Check how each learner is doing.

#### Activity 2

This is a map-reading exercise with a calculation, where tolerances are provided in terms of rounding off. Give learners the opportunity to review their answers against the above answers. Check how each learner is doing.

#### Activity 3

Let learners cross-check and discuss their answers based on the photo. The slope angle estimates don't require precise answers (estimating within  $5^\circ$  or  $10^\circ$  is fine).

#### Activity 4

Draw the intervisibility diagram on the board so that learners can compare their diagrams.

#### Activity 5

Learners can check answers with a partner. However, you might need to provide guidance. Some landforms could have more than one interpretation; for example, a mesa and a butte could both be regarded as correct answers for a flat-topped hill. Check how learners are doing.

### Remedial

Mapwork and map and image interpretation require practice. Learners can be asked to repeat certain questions or to undertake the same activities, but with different features or place names substituted for the originals.

### Extension

- Use Internet sources to interpret photos of landforms.
- Ask learners to use the camera on their cell phone to photograph a local topographic feature and show it to a partner or group for identification of the feature.

Learner's Book  
pages 133–142  
Duration: 2 hours

## UNIT 3

## Aerial photographs and orthophoto maps

TERM 1, WEEK 8

### Curriculum and Assessment Policy Statement (CAPS) content

#### Aerial photographs and orthophoto maps

- Interpreting vertical aerial photographs
- Orthophoto maps – identifying features
- Comparing an orthophoto map with a topographic map

### Resources

- Learner's Book, pages 133–142
- Websites (optional):
  - For information on topographic maps: [http://en.wikipedia.org/wiki/Topographic\\_map](http://en.wikipedia.org/wiki/Topographic_map)
  - <http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)
- Aerial photos can be obtained from the department of Rural Development and Land Reform. Go to: <http://www.ngi.gov.za/index.php/Image-tabs-home/national-aerial-photography-and-imagery-programme.html> for more information.

### Preparation

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules, as this skills development module requires a theoretical background in physical geography.
- The last website listed above is highly recommended.
- Refer back to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this module builds.

### Teaching the unit



#### Lesson 1

- Aerial photos were briefly introduced in the previous unit.
- Ask learners what they know about aerial photos, and vertical and oblique aerial photos.
- Remind them that aerial photos are taken from the air. The camera is usually mounted in an aircraft.

- Vertical aerial photos are taken from above the landscape, while oblique photos (high or low oblique) are taken from an airborne platform, but at an angle.
- Orthophoto maps are a hybrid, combining the advantages of a photo (real-life detail) with those of a map (symbols which facilitate identification of features, as well as an accurate representation of height via contour lines).
- Go through the section, 'How do we interpret oblique and vertical aerial photographs?' (pages 133–136) with learners.

### Activity 1

Learners can work in pairs to answer the questions on the photo in Figure 3.3.5 (page 136) of the Learner's Book.

### Activity 2

Learners can work in pairs to answer the questions on the photo in Figure 3.3.7 (page 138) of the Learner's Book.



## Lesson 2

- The lesson is based on practical identification of features from a topographic map, aerial photos, and an orthophoto map of the same area.
- Remind learners about what they have already learnt, and emphasise that this is a consolidation lesson, where skills will be reinforced and practised.
- Go through the section, 'What are the identifying features of orthophoto maps?' (page 139) with learners.

### Activity 3

- The comparison of three resources is dealt with in this activity – aerial photos, an orthophoto map and a topographic map.
- The area chosen is Sedgefield in the southern Cape, because it has a varied physical landscape and plenty of constructed features.
- Spend some time discussing the strengths and weaknesses of each of the three resources before asking learners to undertake Activity 3.
- Remind learners that there are not always right or wrong answers, and some learners may find it easier to read information from one source rather than from another.
- If learners can defend their choice, they will be given credit.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers

### Activity 1 (Learner's Book, page 136)

1. Oblique aerial photo: taken with the camera slanted at an angle to the Earth's surface
2. Physical features are easily identified; relative height between certain features is shown.
3. Vertical aerial photo
4. Any of the following: drawn to scale; accurate measurement of distance; position and relief; used for planning and development (GIS spatial planning)

**Activity 2** (Learner's Book, page 138)

1. If this was a black and white photograph, tone would be reflected by different shades of grey. The darker an object appears, the less the amount of light it reflects. Water masses in this photograph would therefore be reflected in a very dark shade of grey.
2. Industrial purposes. Large buildings can be identified and the distance between buildings is greater. Railway and harbours available for transport.

**Activity 3** (Learner's Book, page 142)

Attribute	Aerial photo	Orthophoto map	Topographic map
Coastal dunes	X		
Deep and shallow water in sea and vleis	X		
Drainage lines			X
Farm or plantation boundaries			X
Flight-plan information	X		
Forestry areas		X	
Large-area photo coverage	X		
Proclaimed national parks and marine reserves			X
Railway lines			X
Road distances			X
Rocky and sandy coasts	X		
Sand banks	X		
Settlements		X	
Spot heights			X
Steepness of slopes		X	
Suburb names		X	
Whitewater (surf) zones	X		
Other information which you have identified			X

Note: the above are not prescriptive answers. If learners can defend their choice, they should be given credit.

**Informal assessment****Activity 3**

Because some of the responses to the activity will be subjective (not all learners will agree in each particular case), assessment must take the form of idea-sharing and exchanges in small groups.

**Remedial**

Ask learners to formulate their own questions around the maps and photos in this module; and then to use these to ask each other questions in pairs or small groups.

**Extension**

Ask your school to order aerial photos and/or orthophoto maps which cover your area, so that learners can relate to known material.

### **Curriculum and Assessment Policy Statement (CAPS) content**

#### **Geographical Information Systems (GIS)**

- Examination of GIS information for different catchment areas
- Developing a 'paper GIS' from existing maps, photographs or other records on tracing paper

#### **Resources**

- Learner's Book, pages 143–150
- Tracing paper

#### **Preparation**

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules, as this skills development module requires a theoretical background in physical geography.
- Refer back to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this module builds.

### **Teaching the unit**



#### **Lesson 1**

- Begin by asking learners what the term GIS means.
- Stress that you cannot run a GIS without computer hardware (a laptop, desktop or mainframe computer) and good GIS software.
- Ensure that learners understand what a GIS can do, and what it cannot do; and how it differs from any other computer-based facility which stores and manipulates data.

#### **Activity 1**

- The activity is based on theoretical aspects of GIS.
- GIS jargon (the language of the discipline) is also practised.
- The focus in this unit is on GIS and catchment areas; data inputs on the physical aspects of the chosen catchment(s); as well as the human impacts, to properly manage the catchment or to resolve environmental issues.
- Go through the section, 'How do you examine GIS information for different catchment areas?' (pages 144–145) with learners.
- Go through the section, 'How do you develop a paper GIS from existing maps, photographs or other records on tracing paper?' (page 146) with learners.

#### **Activity 2**

- This activity involves constructing a paper GIS using overlays.
- Learners trace and overlay the five outline maps in their books to get the final product.

- Once the layers are assembled, they draw a final GIS map.
- Learners need to interpret the GIS map in light of the criteria on page 146 of the Learner's Book, to make certain decisions.

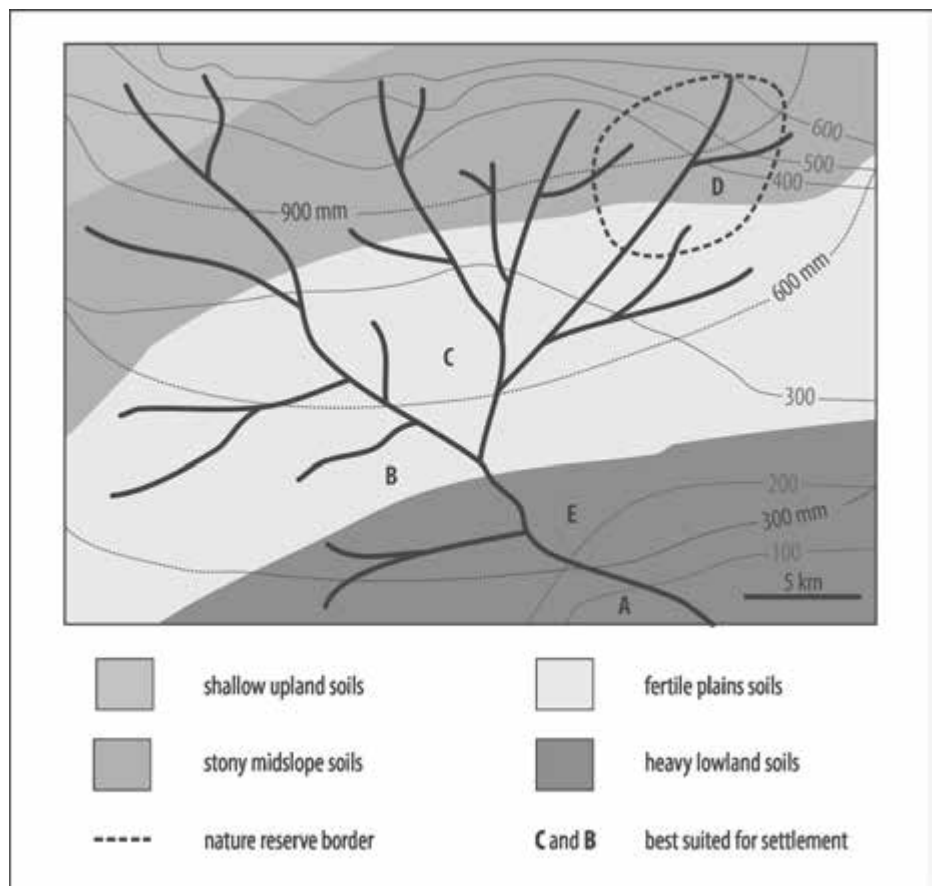
## Answers

### Activity 1 (Learner's Book, page 143)

- Spatially-referenced data: data used to provide the visual representation of a geographic space; stored as raster and vector types. Spatial data is a combination of location data and value data needed to generate a map.
- Attribute data: descriptions, measurements, and classifications of geographic features. Attribute data is classified into one of four levels of measurement, namely nominal, ordinal, interval or ratio data.
- Spatial resolution: refers to the area covered. Meteosat, for example, covers the whole of the Earth from horizon to horizon, but of course the scale is very small – size of image elements.
- Spectral resolution: refers to that part of the electromagnetic spectrum which is sensed by the particular remote-sensing device (a camera records the visible part of the spectrum; visible light).
- Raster data models: represent the landscape as a rectangular matrix of square cells.
- Vector data models: represent features as discrete (separate) points, lines or polygons.

### Activity 2 (Learner's Book, page 146)

- Once learners have assembled the different layers, they should get a final GIS map like the one below.



2. a. Take the length and height of the map and use the scale to determine the distances in kilometres ( $5,6 \text{ km} \times 4 \text{ km} = 22,4 \text{ km}^2$ ).
- b. Place tracing paper with  $1 \text{ cm} \times 1 \text{ cm}$  squares on the diagram. Each square in which a portion of the river or its tributaries falls, gets included in the calculation. Count the included squares. Each square is  $1 \text{ cm}^2$ . Multiply this by the scale squared to get an answer in  $\text{km}^2$ .
3. The answers to question 3 a–f are provided on the final GIS map (master overlay). Scan or copy this map onto an OHP transparency or data projector image. Learners need to compare their paper GIS maps to this final master overlay. Discuss which areas learners identified as being:
  - a. best suited to agriculture
  - b. secondary areas for agriculture
  - c. the area/s subject to severe flooding
  - d. the area/s subject to waterlogging
  - e. the area/s that should be preserved as catchment
4. the area/s that are best for settlement (B and C) – they are on fairly level terrain, close to water (but not so close as to risk flooding), and they are not in the nature reserve area.

## Informal assessment

### Activity 1

Learners can cross-check answers with a partner or in small groups.

### Activity 2

- Provide learners with a copy or OHP of the above template to compare with their own final map and for a final interpretation.
- Lead a class discussion about the answers to question 3. Observe which learners seem to be struggling.

### Assessment

#### Task 1:

For information on how to assess the learners' completed tasks, please see pages 171–172 in the Formal Assessment section of this Teacher's Guide.

### Remedial

Give a snap assessment on GIS definitions. Correct learners by referring back to the relevant content in the Learner's Book where there are gaps or weaknesses.

### Extension

Hands-on GIS extension available from: <http://grass.osgeo.org/download/index.php>. However this requires access to a computer and free software and is not recommended, other than to learners with a genuine aptitude for GIS and a desire to learn more.

Learner's Book  
pages 153–158  
Duration: 3 hours

## REVIEW

TERM 1, WEEK 9

These activities provide an opportunity for learners to consolidate concepts and skills learnt in Term 1. Learners can complete them in class or as homework. It is suggested that they complete the activities individually as a means of self-assessment.

You can write the answers on the board for the learners and/or call them out where more appropriate. However, if possible, it is suggested that you photocopy the answers and give them to the learners so that they have them for revision purposes.

**Activity 1** (Learner's Book, page 153)

	Mid-latitude cyclones	Tropical cyclones
Where they occur generally	mid-latitudes (30°–75° N and S of Equator)	tropics, but not at the Equator (5°–30° N and S)
Where in South Africa they occur	Western Cape and along the south-east coast; they occasionally penetrate the interior	on the east coast of southern Africa (Mozambique and KZN)
When they occur	throughout the year, but they reach South Africa in winter months only (because of the shift in the thermal equator)	in late summer, when sea temperatures are at their highest
Low- or high-pressure system	low	low
Wind pattern	Wind spirals into the low-pressure cell in a clockwise direction in the southern hemisphere (and in an anticlockwise direction in the northern hemisphere).	Wind spirals into the low-pressure cell in a clockwise direction in the southern hemisphere (and in an anticlockwise direction in the northern hemisphere).
Wind strength	Winds are generally gentle, although they can be strong.	Winds are gale-force and very destructive.
Pressure gradient	medium	steep
Isobar pattern	Isobars are oval.	Isobars are circular.
General direction of movement	from west to east (eastwards)	from east to west (westwards)

**Activity 2** (Learner's Book, page 153)

1.

	Anticyclones
Where they occur generally	subtropics, in the subtropical high-pressure zone (25°–35° N and S of Equator)
Where in South Africa they occur	over the Atlantic Ocean (off the west coast), inland over the interior, over the Indian Ocean (off the east coast)
When they occur	They are present throughout the year, but their positions shift with the seasons/thermal equator. They shift further north in winter and further south in summer.)
Low- or high-pressure system	high
Wind pattern	Wind spirals out the high-pressure cell in an anticlockwise direction in the southern hemisphere (and in a clockwise direction in the northern hemisphere).

2.

South Atlantic high-pressure cell	South Indian high-pressure cell
<ul style="list-style-type: none"> <li>• Produces stable conditions on the <u>west</u> coast. Pushes in cool, <u>dry</u> air.</li> </ul>	<ul style="list-style-type: none"> <li>• Brings rain to the <u>eastern</u> half of the country. Pushes in warm, <u>moist</u> air.</li> </ul>
<ul style="list-style-type: none"> <li>• In summer, produces the <u>offshore</u> winds that dominate the Atlantic Ocean coast.</li> </ul>	<ul style="list-style-type: none"> <li>• In summer, produces the <u>offshore</u> winds from the south-east or the <u>north-east</u>, which dominate the Indian Ocean coast.</li> </ul>
<ul style="list-style-type: none"> <li>• In winter, sometimes <u>ridges</u> behind a cold front, pushing it inland.</li> </ul>	<ul style="list-style-type: none"> <li>• In winter, moves <u>inland</u>.</li> </ul>

Kalahari high-pressure cell in winter...
<ul style="list-style-type: none"> <li>• sinks vertically when the landmass is <u>cold</u> and there is less rising hot air.</li> </ul>
<ul style="list-style-type: none"> <li>• lowers the height of the <u>temperature inversion</u> and so pins moist Indian Ocean air below the level of the escarpment, preventing it from reaching the plateau.</li> </ul>
<ul style="list-style-type: none"> <li>• produces stable conditions over the plateau. There is clear sky and no rain, but sometimes <u>frost</u> when dewpoint temperatures are very low.</li> </ul>
<ul style="list-style-type: none"> <li>• contributes to the formation of hot, dry <u>berg</u> winds.</li> </ul>

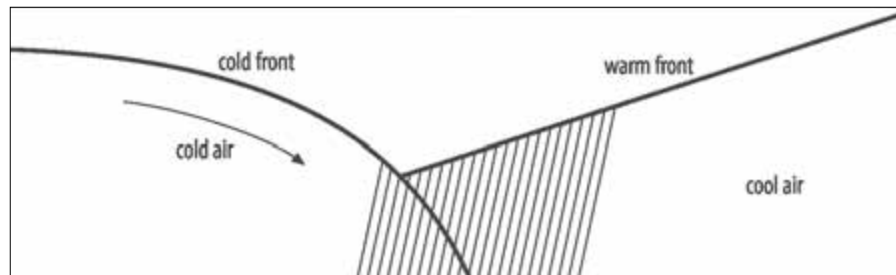


**Activity 3** (Learner's Book, page 154)

1. mid-latitude cyclone
2. eastwards/ from west to east
3. northern hemisphere; the winds spiral into the low-pressure cell in an anticlockwise direction.
4. A6; B4; C3; D2; E1; F5
5. The cold front catches up with the warm front and lifts the warm air off the ground.
6. a.



b.



**Activity 4** (Learner's Book, page 154)

1. A = South Atlantic High; B = South Indian High
2. summer
3. The air mass that forms over the warm Mozambique/ Agulhas Current of the Indian Ocean holds more moisture than the air mass that forms over the cold Benguela Current of the Atlantic Ocean.
4. moisture trough/ moisture front
5. Warm, moist air is forced to rise fast and high. There is extensive cooling and condensation.
6. eastern side
7. They bring rain, but heavy rain and hail can cause flooding, soil erosion and crop/ livestock damage. Lightning causes fires.
8. convection

**Activity 5** (Learner's Book, page 155)

1. Both summer and winter. Onshore winds bring moist, cloudy conditions (rain along coastline or fog on west coast); offshore winds on other half of cell bring warm, dry conditions.
2. winter
3. a high pressure over the interior; the presence of the Kalahari high-pressure cell and a coastal low; slope at which air descends the escarpment
4. Descending air of anticyclone is already warm and dry. It is heated further by adiabatic descent/ compression.
5. veld fires
6. mid-latitude cyclone

**Activity 6** (Learner's Book, page 156)

1. anabatic wind/upslope wind/valley breeze
2. afternoon (once the surface has heated up)
3. Air on slopes heats up faster than air at equivalent height above the valley floor. Warm air rises further up the slope, cools, and descends, setting up an air circulation cell.

**Activity 7** (Learner's Book, page 156)

1. A = infiltration; B = surface run-off; C = baseflow; D = groundwater; E = water table
2. X = episodic river; Y = periodic river; Z = permanent/perennial river

**Activity 8** (Learner's Book, page 157)

drainage basin = the land drained by a river and its tributaries

confluence = the point where two rivers meet

tributary = a smaller stream/river that flows into a larger stream/river

watershed = the high land that divides one drainage basin from another

meander = a tight bend in a river

cross profile = transverse profile = a slice or view across the river

mouth = the place where the river empties into the sea

permanent base level = sea level = the lowest level to which a river can erode

**Activity 9** (Learner's Book, page 158)

2. Senqu
3. Vaal
4. exotic river
5. a. Augrabies Falls  
b. Orange River Mouth  
c. Gariep Dam, Vanderkloof Dam, Augrabies Falls  
d. the Lesotho section of the river
6. a. rapids = fast-flowing, rough sections of the river, which are usually stepped and littered with rock obstacles  
b. braided = contains islands of sand deposits  
c. delta = sandbars or land formed by silt deposits at a river's mouth  
d. alluvial = relating to the fine mineral-rich soil/silt deposited by rivers
7. (1) The river is heavily drawn for water (for irrigation, municipal use and hydroelectricity). Dam construction and transfer schemes reduce the river's discharge/flow patterns – this may explain why the water does not reach the river mouth in dry years. With changes in river flow patterns, the balance of erosion and deposition changes.  
(2) The river mouth is mined for diamonds. Mechanical activity such as dredging and scouring has severely damaged the wetland habitat of the river delta.

Management strategies or solutions include:

- Regarding water use: strict monitoring of water use; equitable sharing of water resources; where possible, reducing water wastage; environmental impact assessments for dams or water projects.
- Regarding wetland damage: rehabilitation of the wetlands to restore or conserve plant and animal biodiversity.

**Test 1:**

For information on how to assess the learners' answers, please see pages 173–176 in the Formal Assessment section of this Teacher's Guide.

	<b>MODULE 4</b>	
<b>TERM 2</b> Learner's Book pages 159–194 Duration: 14 hours Lessons: 28 half-hour lessons, or 14 hour long lessons	<b>RURAL SETTLEMENTS:  GEOGRAPHICAL KNOWLEDGE</b>	

Settlement geography is the study of the interaction between people and the Earth. It explains where, why and how humans choose to settle and make their homes in particular spaces. Settlement geography categorises human settlements in terms of their size, complexity, pattern and function. It looks at the range of settlements from the smallest to the largest, at rural settlements to urban settlements, and at the consequences of human migration. This module focuses on the study of rural settlements.

### **Curriculum and Assessment Policy Statement (CAPS) content**

#### **Study of settlements**

- Concept of settlement
- Site and situation
- Rural and urban settlements
- Settlement classification according to size, complexity, pattern and function

#### **Rural settlements**

- How site and situation affect the location of rural settlements
- Classification of rural settlements according to pattern and function
- Reasons for different shapes of settlements: round, linear, T-shaped and crossroads
- Land use in rural settlements

#### **Rural settlement issues**

- Rural-urban migration
- Causes and consequences of rural depopulation on people and the economy
- Case study that illustrates effects of rural depopulation and strategies to address them
- Social justice issues in rural areas, such as access to resources and land reform

#### **Key geographical skills and techniques**

- processing, interpreting and evaluating data
- identifying questions and issues
- collecting and structuring information
- making decisions and judgements
- deciding on a point of view
- suggesting solutions to problems
- working co-operatively and independently
- applying communication, thinking, practical and social skills
- interpreting sources
- using verbal, quantitative and symbolic data forms such as text, pictures, graphs, tables, diagrams and maps

## Key words/concepts

isolated settlement; dispersed settlement; nucleated settlement; linear shape; T-shaped settlement

Learner's Book  
pages 161–170  
Duration: 3 hours

## UNIT 1

## Study of settlements

TERM 2, WEEK 1

### Curriculum and Assessment Policy Statement (CAPS) content

#### Study of settlements

- Concept of settlement
- Site and situation
- Rural and urban settlements
- Settlement classification according to size, complexity, pattern and function

#### Resources

- Learner's Book, pages 161–170
- Websites (optional):
  - [http://www.mediaclubsouthafrica.com/index.php?option=com\\_content&view=article&catid=37:economy\\_bg&id=111:sa-economy-key-sectors](http://www.mediaclubsouthafrica.com/index.php?option=com_content&view=article&catid=37:economy_bg&id=111:sa-economy-key-sectors)
  - [http://www.climateriskandopportunity.co.za/downloads/Section\\_1to3/Climate\\_Change\\_&\\_SA\\_Economy\\_Economy\\_Overview\\_2010](http://www.climateriskandopportunity.co.za/downloads/Section_1to3/Climate_Change_&_SA_Economy_Economy_Overview_2010)
- The school library may have magazines and newspaper articles about the concept of settlement. Look in any encyclopaedia, under 'Settlements' to get more background information.
- Map of the world for reference in class, or a set of class atlases

#### Preparation

- Read through and familiarise yourself with the content.
- On a world map or in a class atlas, find the major rivers of India, Egypt and Iran/Iraq, where urban settlements first developed.

#### Teaching the unit

##### » Lesson 1

- The important thing in this unit is to provide learners with an historical perspective or background, to the study of human settlement. From simple beginnings to vast urban areas that merge into each other to form an almost continuous spread of urban dwellings, urbanisation is a dynamic process.
- Go through the text on pages 161–163 in the Learner's Book and refer to the maps in Figures 4.1.1–4.1.4. Ask learners to find these areas on the class map of the world, and/or in their class atlases.

#### Activity 1

Work as a class or in pairs. This activity helps to consolidate what learners have read about the concept of settlement, early human settlements and the study of human settlements.

### Activity 2

This activity focuses on where and why people settled in various areas of the world – what made these locations attractive for early settlements?

- Go through the section, ‘What are site and situation?’ (pages 164–166) with learners.
- Ask learners to work in pairs or on their own to read through the case studies, ‘The ghost town of Kolmanskop, Namibia’ (page 165) and ‘From one function to many – the story of the growth of Johannesburg’ (page 166).

### Activity 3

- The activity focuses on the difference between site and situation.
- Learners work in pairs to answer the questions.



## Lesson 2

---

Work as a class to go through the section, ‘What is the difference between a rural and urban settlement?’ (pages 166–168).

### Activity 4

- Have a class discussion about the difference between rural and urban settlements, using the questions as a guide.
- Learners work on their own to write a paragraph about why a multi-disciplinary approach is advocated to define what is meant by a rural settlement.
- Work as a class to go through the section, ‘How are settlements classified?’ (pages 169–170).
- Ask learners to give examples from their own experiences of different types of settlements in the hierarchy of settlements. Ask them to provide reasons for their choice of example.

### Activity 5

- This activity focuses on settlement classifications according to size, complexity, pattern and function.
- Learners work on their own to answer the questions.
- They can then discuss their answers with a partner.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners’ answers.

### Activity 1 (Learner’s Book, page 163)

1. The concept of settlement describes where people live.
2. the birth place of human and social development
3. planting of cereal crops; keeping of sheep and goats; surplus production
4. the study of human settlements
5. the focus on human settlements as an index of national and global social and economic development; human settlements as an objective for social and economic development; the focus on sustainability between people and their environment

**Activity 2** (Learner's Book, page 164)

1. Indus; Ganges; Brahmaputra
2. Brahmaputra River
3. a. Kolkata; b. Karachi
4. Iraq, Iran, Turkey, Syria
5. flat land for settlement; rivers for transport; rivers for water for crops, animals and people; flooding of the river brings down alluvium; fertile land for agriculture
6. Settlers came from Europe to the eastern coast of America; it is accessible for ocean transport; it is the shortest distance to Europe and Africa; long rivers for transport into the interior; fertile coastal plain for agriculture.
7. Italy, Austria, Switzerland, France, Germany, Holland, Belgium, England
8. the Po River in Italy; the Rhine River across France and Germany; the Thames River across England

**Activity 3** (Learner's Book, page 166)

1. Site is the exact physical location of a settlement.  
Situation refers to how other factors interact to affect the choice of developing a settlement at a site.
2. a. a natural crossing point of the Buffalo River (different river to East London's Buffalo River)  
b. a natural harbour at the mouth of the Buffalo River  
c. the discovery of diamonds
3. It was the site of the first European settlement; it had a natural harbour in Table Bay; there was fresh water; there was a coastal plain for settlement; it is the gateway to Africa.

**Activity 4** (Learner's Book, page 169)

1. There is no uniform classification of a 'rural settlement'; everything that is not urban is rural; nations have different ways of classifying rural settlements based on numbers or functions.
2. urban settlements: high-rise buildings; densely packed buildings; communication infrastructure; shops  
rural settlements: isolated, single dwellings; no shops; dirt roads; no advertising boards
3. size; function; land use
4. Answers will differ, but should include the following points: rural and urban are not opposites but part of a continuum; transition between rural and urban can be gradual; functions merge, services and housing types merge.

**Activity 5** (Learner's Book, page 170)

1. The drawing should look like the hierarchy on page 169 of the Learner's Book.
2. differences in extent of the settlement; in size of the population; in the density of the population numbers
3. dispersed settlement: isolated houses, or groups of buildings that are scattered over land and 2–4 km distant from each other  
nucleated settlement: a cluster of houses grouped together
4. defence; division of labour; attraction of variety of skills; presence of different services; variety of functions; job opportunities

## Informal assessment

### Activity 1

Learners should check their own answers against the answers provided above. Check that all learners understand the concepts covered.

### Activity 2

Supply the correct answers (see above) and discuss these with the class.

### Activity 3

Learners work in pairs to assess their answers against the answers you provide.

### Activity 4

Learners should check their own answers against the answers provided above. Check that all learners understand the content and concepts covered.

### Activity 5

Supply the correct answers (see above) and discuss these with the class. Check that all learners understand the content and concepts covered.

## Remedial

Ask those learners who need extra assistance with the concept of settlements, to use an atlas or encyclopaedia to find new examples in South Africa of the following: farmstead; hamlet; village; town; city; metropolis; conurbation; megalopolis. They should give reasons for their choice of each example (looking at size, complexity, pattern and function).

## Extension

Provide learners with the names of at least ten new settlements in South Africa, and ask them to classify them as either rural or urban; and according to size, complexity, pattern and function. They should provide reasons for their choice of category.

Learner's Book  
pages 171–180  
Duration: 5 hours

## UNIT 2

## Rural settlements

TERM 2, WEEKS 1–2

## Curriculum and Assessment Policy Statement (CAPS) content

### Rural settlements

- How site and situation affect the location of rural settlements
- Classification of rural settlements according to pattern and function
- Reasons for different shapes of settlements: round, linear, T-shaped and crossroads
- Land use in rural settlements

### Resources

- Learner's Book, pages 171–180
- Websites (optional):
  - [http://myfundi.co.za/e/Settlements\\_III:\\_Rural\\_settlements\\_in\\_South\\_Africa](http://myfundi.co.za/e/Settlements_III:_Rural_settlements_in_South_Africa)
  - <http://geography.about.com/od/urbaneconomicgeography/a/sitesituation.htm>
  - [http://en.wikipedia.org/wiki/Dispersed\\_settlement](http://en.wikipedia.org/wiki/Dispersed_settlement) and <http://www.preservearticles.com/2012013022138/short-essay-on-the-classification-of-rural-settlements.html>

- The school library may have magazines and newspaper articles about rural settlements. Look in any encyclopaedia, under 'Settlements' or 'site and situation' and 'pattern and function' to get more background information.
- Map of the world for reference in class, or a set of class atlases
- National Geographic DVDs of life in tropical areas and frozen areas

### Preparation

- Read through and familiarise yourself with the content.
- Have a set of class atlases available to find the settlements mentioned in this unit.
- Refer learners to DVDs or to TV channels that show tropical areas, desert areas, mountainous areas and frozen wastelands. Try to incorporate visuals from these programmes into your lesson to help give learners an understanding of these areas.
- Note that there is considerable overlap between this section and Units 1, 2 and 3 of Module 5 (Urban settlements) in terms of site and situation, classification of urban settlements, and lower- and higher-order functions and services and land use zones.

## Teaching the unit



### Lesson 1

- Read through the section, 'How do site and situation affect the location of rural settlements?' (pages 171–173) with learners.
- Use the class atlases to refer to the variety of locations mentioned, such as the Gobi Desert, the Amazon River, the Sahara Desert, and Mapungubwe.
- Discuss the climatic and physical challenges that these areas pose to people.

#### Activity 1

Learners work in pairs to list the climatic and physical challenges the areas pose to settlements and to suggest how people can or have overcome these challenges to create settlements.



### Lesson 2

- Read through the section, 'How are rural settlements classified?' (pages 173–175) and 'Why do settlements have different shapes?' (pages 175–177) with learners.
- Use the board to draw isolated, dispersed, and clustered or nucleated settlement patterns. Ask learners for local examples of these settlement patterns.
- Under the heading 'nucleated pattern' write down the different settlement shapes: linear, crossroads, T-shaped and round. Ask learners for local examples.

#### Activity 2

- Learners work on their own to complete the questions.
- They can use the atlases, encyclopedias or the Internet to try to find out the dominant function associated with each capital city in South Africa.
- They can then discuss their answers in pairs.

#### Activity 3

Learners work on their own on their table of settlements types.





## Lesson 3

- This section focuses on rural land use. Ask learners to brainstorm what people would use land in rural areas for.
- Read through the section, ‘How do humans use the land in rural settlements?’ (pages 177–180) with learners.
- Draw Von Thünen’s model of land use on the board and refer to it when discussing this section. Ask learners to explain how it can be used to analyse their own area.

### Activity 3

- This activity focuses on rural land use in South Africa.
- Have a class discussion, using the questions as a guide.

### Activity 4

This activity focuses on the application of Von Thünen’s model and whether or not it is still useful today.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners’ answers.

### Activity 1 (Learner’s Book, page 173)

- soil fertility; availability of water; cultivatable soil; pastures; fuel; building materials
  - too hot; too wet; too dry; too cold; presence of ice and snow
- Adaptations include: building dwellings on floating wood or reeds in tropical areas; temporary shelters are used by nomadic people in the desert; dwellings made out of ice are still used in the frozen areas of the northern hemisphere (these are called ‘igloos’)
- They build to keep out the heat of the Sun; to allow a flow of air; to have protection against cold winds; they use electricity to create central heating; and air-conditioning; slope gradient; direction dwellings face
- Mapungubwe shows that as early as the 13th century in Limpopo Province, there was a sophisticated civilisation that traded, had artwork, built defensively, and had a hierarchy of power.

### Activity 2 (Learner’s Book, page 174)

- isolated; dispersed; nucleated
- function of the area in which learners live, e.g. mining, seaport, tourism
- Accept reasonable and appropriate explanations.
- Cape Town is the legislative capital, with Parliament; Pretoria is the administrative capital, with the government; Bloemfontein is the judicial capital, with the Supreme Court of Appeal.

### Activity 3 (Learner’s Book, page 177)

The table should show the three settlement types with examples, such as the one below:

	Isolated	Dispersed	Nucleated
Reason	choice	agricultural area	services
Example	any farm	Karoo farms	any town, e.g. Cradock

**Activity 4** (Learner's Book, page 180)

- 1 the way in which humans choose to use land
- 2 Land use affects natural resources and determines human activities; the environment is important; sustainability of the resources and the environment is important; access to and control over resources is a political and economic consideration.
3. agriculture
4. Arable farming needs plentiful water and fertile soil. This is limited to the eastern areas of South Africa. Water and the kind of soil is important.
5. commercial – large plantations; well-maintained; evidence of irrigation in greenery; high economic output  
subsistence – small cultivated area; animals grazing in unfenced area; no irrigation systems; poor community (simple dwellings and fences); no infrastructure

**Activity 5** (Learner's Book, page 180)

1. Labelled diagram to show Von Thünen's model of land use (see page 178 of the Learner's Book): The black dot in the middle represents a city; 1 represents dairy and market gardening; 2 represents forest for fuel; 3 represents grains and field crops; 4 represents ranching; the outer, dark green area represents wilderness where agriculture is not profitable.
2. transport costs and land costs
3. Refrigerated trucks; railways; efficient transport all lessen the relevance of the model; but, it can still be used to explain the development of settlements.

**Informal assessment****Activity 1**

Learners should check their own answers against the answers provided above. Check that all learners understand the concepts covered.

**Activity 2**

Supply the correct answers (see above) and discuss these with the class.

**Activity 3**

Learners work in pairs to check their tables.

**Activity 4**

Learners should check their own answers against the answers provided above. Check that all learners understand the content and concepts covered.

**Activity 5**

Supply the correct answers (see above) and discuss these with the class. Check that all learners understand the content and concepts covered.

**Remedial**

Use Columns 1 and 2 of Table 4.2.1 Categories of settlements (page 175 of the Learner's Book), but jumble up the descriptions in Column 2. Ask learners to match the function with the correct description. Learners can check their answers against Table 4.2.1.

**Extension**

Ask learners to use Von Thünen's model of land use (page 178 of the Learner's Book) to analyse land use in South Africa (page 179 of the Learner's Book).

## **Curriculum and Assessment Policy Statement (CAPS) content**

### **Rural settlement issues**

- Rural-urban migration
- Causes and consequences of rural depopulation on people and the economy
- Case study that illustrates effects of rural depopulation and strategies to address them
- Social justice issues in rural areas, such as access to resources and land reform

### **Resources**

- Learner's Book, pages 181–194
- The school library may have magazines and newspaper articles about rural-urban migration. Look in any encyclopaedia, under 'Rural depopulation' to get more background information.
- Map of Africa and South Africa and the world for reference in class, or a set of class atlases
- Past Geography examination papers (Rural settlement section) for extension activities

### **Preparation**

- Read through and familiarise yourself with the content.
- Have a set of class atlases available to find the settlements mentioned in this unit.
- There is overlap between this unit and the last unit of Module 5 in terms of urban settlement issues such as those caused by rapid urbanisation, the growth of informal settlements and associated issues, and the case studies on how urban areas are managing urban challenges.

## **Teaching the unit**



### **Lesson 1**

- Ask learners why they think there is a growing trend towards urbanisation around the world; on the African continent; and in South Africa.
- Read through the section, 'What is the rural-urban migration pattern in South Africa?' (pages 181–183) with learners.

### **Activity 1**

- Work in small groups to answer the questions.
- Refer learners to the map in Figure 4.3.2 (page 182 of the Learner's Book) to find all the previous homelands.

- Read through the section, ‘What are the causes and consequences of rural depopulation on people and the economy?’ (pages 183–185) with learners.
- Use the class atlases to refer to the variety of locations mentioned in this section.

### Activity 2

- Learners write a diary entry about reasons for wanting to leave the countryside, and the attractions in the city.
- Remind learners that their answers must be in full sentences and set out in paragraphs.

### Activity 3

- Learners can first discuss the questions in pairs or as a class, and then complete the activities on their own.
- When learners have completed the activity, have a class discussion on questions 4 and 5.

## » Lesson 2

---

### Activities 4 and 5

- Ask learners to work in small groups to read through the case studies on pages 188–189 of the Learner's Book.
- They should use a wall map or atlas to locate the areas mentioned in the case studies, and to find Alexandra in a map of Johannesburg, Gauteng.
- They should then remain in their small group to work through Activities 4 and 5.
- If there is time, each group can briefly report back answers to the class.

## » Lesson 3

---

- Read through the section, ‘The government’s role in addressing the causes and consequences of migration’ (pages 190–192) with learners.
- Use a wall map of Africa to locate places mentioned in this section.
- Read through the case study, ‘Rural depopulation and a counter strategy: Ethiopia’ (page 192) with learners.
- Ask learners to point out the SADC countries.

### Activity 6

- Have a class discussion on these questions.
- Ask learners what they understand by the term, ‘social justice’. Ask for examples of social injustice and examples of what has been done to remedy or right these injustices.
- Read through the section, ‘What are some important social justice issues in rural areas?’ (pages 192–194) with learners.
- This section specifically focuses on land use and access to land in South Africa.

### Activity 7

- This activity focuses on how the South African government is attempting to address the social injustices of the past, especially with regard to access to land.
- This activity could lend itself to a lively class discussion.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.

### Activity 1 (Learner's Book, page 183)

- (1) KZN; (2) Limpopo; (3) Eastern Cape; (4) North West; (5) Mpumalanga; (6) Free State; (7) Western Cape; (8) Northern Cape; (9) Gauteng
- Black African people were not allowed to buy land anywhere other than in the 13% of South Africa set aside as homelands for them, except in the Cape Province.
- Transkei; Bophuthatswana; Venda; Ciskei
- Urban areas were maintained as predominantly white areas; rural areas became associated with predominantly black areas.
- They are mostly in the eastern half of South Africa.
- The eastern half of South Africa was first settled by the traditional tribes.
- it has no homelands, except for the northern area in which Bophuthatswana is located
- in the developing world; in Africa and Asia
- employment opportunities in cities increases; more people are moving there
- China, 1993–2003; the USA, 1916–1970

### Activity 2 (Learner's Book, page 185)

Diary entries will differ, but could include these points:

Reasons for wanting to leave the countryside	Attractions of the city
degradation of land through poor farming methods	economic job opportunities
reduced soil fertility	diverse labour opportunities
soil erosion	better range of housing
increasing desertification of marginal land	transport, communication networks
erratic weather caused by climate changes	independence from erratic weather
droughts	independence from extreme weather
floods	wide range of services, e.g. shops
crop and/or livestock diseases	attraction of the 'city lights'
reduced carrying capacity of the land	diverse entertainment
reduced farm sizes through inheritance	more reliable source of food
unemployment/redundancy caused by mechanical innovations	independence from family
poor economic returns on long hours of labour	safety from tribal conflict areas

### Activity 3 (Learner's Book, page 187)

- People need some money to get settled again; in case they don't get a job immediately; for rental; for schooling; for transport
- male; young; in South Africa, many white families; unemployed

3. Gauteng; coastal cities
4. Globalisation has spread the attraction of urban living to the far corners of the Earth, through access to social media, the Internet, satellite television, movies, music, advertising, food products, cars, fashion, and a wide range of products.
5. Learners should answer in full sentences and in a paragraph. Points to consider include:  
Positive effect on rural area: money is sent back to families; smaller fields can merge into larger ones, creating possibilities for commercial, productive farming, less unemployment  
Positive effect on urban area: cheap labour stimulates the economy; new skills can positively impact on the urban economy.

**Activity 4** (Learner's Book, page 188)

1. the growth of slums
2. Africa and Asia
3. A slum is an area of informal dwellings, or shacks, made out of any material; no provision of services; lack of security; lack of sanitation; no access to fresh water; no electricity; a high level of crime; overcrowding; unemployment.
4. yes, on the outskirts of cities
5. armed conflict; erratic weather associated with climate change; the deteriorating capacity of the rural areas to support people; unstable governments; little economic development
6. Governments need to address the consequences of rural depopulation/ find solutions.

**Activity 5** (Learner's Book, page 190)

1. This is a government-initiated programme, introduced in 2001 with the aim of addressing the negative effects in urban areas caused by the increasing rate of rural depopulation.
2. Answers will vary, but could include: poverty; unemployment; malnutrition; drug and alcohol abuse; gangs; crime; violence; overcrowded and unhealthy living conditions; health problems; lack of services; facilities and infrastructure; stress; pollution.
3. No, the Alexandra Renewal Project (ARP) is a regeneration project involving government, NGOs and community organisations, as well as the private sector.
4. Accept any of the following: upgrading current housing; creating affordable housing; planning housing developments; reducing levels of unemployment; establishing a healthy, clean environment; reducing crime and violence; introducing sustainable urban services.
5. Answers will differ. Make sure that learners provide reasons for their answers.

**Activity 6** (Learner's Book, page 192)

2. An alternative self-sustaining solution to rural-urban migration is essential.
3. NEST keeps farmers on their land; teaches communities how to build; how to use sustainable technology; this is similar to the RDP and Comprehensive Rural Development Program in South Africa, but SA does not encourage the same commitment to sustainable lifestyles to keep people in the rural areas.

**Activity 7** (Learner's Book, page 194)

1. Points should include: After 1994, the government appointed the Commission on Restitution of Land Rights (CRLR) with the objectives of resolving land claims and restoring land rights to those people whose land had been taken from them, or to award alternative forms of equitable settlement to communities, people, or the descendants of people who had lost their land as a result of discriminatory laws.
2. market-related restitution
3. Land is needed for residential areas; urban areas; commercial business parks; industrial zones; recreational parks; nature conservation; mining; forestry.
4. Answers will differ. Learners should mention ideas such as: arable land being a scarce resource; land near facilities, services and infrastructure being scarce in certain areas; site and situation being important factors.
5. Answers could include the USA, India, China, and sub-Saharan African countries such as Zimbabwe.

**Informal assessment****Activity 1**

The small groups check their own answers against the answers you provide (see above).

**Activity 2**

Learners swap books with a partner to read each other's diary entries and to check the points listed against the table (see above) you either write on the board or put up on the OHP.

**Activity 3**

Check answers as a class against the answers you provide (see above). Make sure that all learners understand the content and concepts.

**Activities 4 and 5**

If there is time, each group can briefly report back answers to the class. Check that each learner participates in the group work and report back.

**Activities 6 and 7**

Have a class discussion on these questions. Observe who participates and who does not participate in the discussion.

**Remedial**

Ask learners to write definitions for these terms: Agenda 21; dispersed pattern; informal settlement; rural depopulation; push factors; pull factors; rural-urban migration. Refer those learners who do not know these terms back to the relevant sections in the module.

**Extension**

Refer learners to past Geography examination papers for more questions on rural settlements.

	<b>MODULE 5</b>	
<b>TERM 2</b> Learner's Book pages 195–238 Duration: 15 hours Lessons: 30 half-hour lessons or 15 hour long lessons	<b>URBAN SETTLEMENTS:  GEOGRAPHICAL KNOWLEDGE</b>	

This module focuses on urban settlements. We look at how cities have evolved, how they are classified, how they are laid out, and what the major challenges for cities are.

### **Curriculum Assessment Policy Statement (CAPS) content**

#### **Urban settlements**

- The origin and development of urban settlements – urbanisation of the world population
- How site and situation affect the location of urban settlements
- Classification of urban settlements according to function, such as central places, trade and transport, break-of-bulk points, specialised cities, junction towns and gateway towns or gap towns

#### **Urban hierarchies**

- the concepts of urban hierarchy, central place, threshold population, sphere of influence and range of goods
- lower- and higher-order functions and services
- lower- and higher-order centres

#### **Urban structure and patterns**

- internal structure and patterns of urban settlements: land use zones; concept of urban profile; and factors influencing the morphological structure of a city
- models of urban structure, such as multiple-nuclei model, the modern American-Western city, the Third World city and the South African city
- changing urban patterns and land use in South African cities

#### **Urban settlement issues**

- recent urbanisation patterns in South Africa
- urban issues related to rapid urbanisation: lack of planning, housing shortage, overcrowding, traffic congestion and problems with service provision
- the growth of informal settlements and associated issues: case studies from the world and South Africa
- case studies that show how selected urban areas in South Africa are managing urban challenges, and handling environmental, economic, and social justice concerns

#### **Key geographical skills and techniques**

- using verbal, quantitative and symbolic data forms such as text, pictures, graph tables, diagrams and maps
- processing, interpreting and evaluating data



## Key words/concepts

urbanisation; urban settlement; site; situation; central place; break-of-bulk point; junction town; gateway town; gap town; urban hierarchy; primate city; secondary city; central place; sphere of influence; threshold population; range of goods; low-order goods/services; high-order goods/services; low-order centre; high-order centre; land use zone; Central Business District (CBD); residential zone; industrial zone; transition zone; rural-urban fringe; urban profile; conturbation; concentric zone model; sector model; multiple-nuclei model; decentralisation; suburbanisation; edge city; township; invasion and succession; urban decay; urban renewal; gentrification; gated community; circular migration; international migration; urban sprawl; traffic congestion

Learner's Book  
pages 196–207  
Duration: 4 hours

## UNIT 1

## Urban settlements

TERM 2, WEEKS 4–5

### Curriculum and Assessment Policy Statement (CAPS) content

#### Urban settlements

- The origin and development of urban settlements – urbanisation of the world population
- How site and situation affect the location of urban settlements
- Classification of urban settlements according to function, such as central places, trade and transport, break-of-bulk points, specialised cities, junction towns and gateway towns or gap towns

#### Resources

- Learner's Book pages 196–207
- Websites (optional):
  - <http://www.geography.about.com/od/urbaneconomicgeography/a/urbangeography.htm>
  - <http://www.oocities.org/ghsgeography/CE/11urban.htm>
  - <http://www.bundi.co.za/ctsg/images/settlement/Cape-Town-Study-Group-Settlement-Course.pdf>
- Wall map of the world to locate the Indus River, Euphrates and Tigris Rivers and the Nile River
- Set of class atlases for group work to find locations mentioned in the text

#### Preparation

- Read through the unit to familiarise yourself with the content.

### Teaching the unit



#### Lesson 1

- You will notice that there are overlaps in the curriculum between this unit and Unit 1 of Module 3. This recycles what learners have previously learnt and reinforces learning.
- The same principles that applied to the site and situation of rural settlements can be applied to urban settlements.
- Use a large map of the world to locate cities mentioned in the text.
- Learners can use the class atlases and practise using the index at the back to locate cities of the world mentioned in the text.

- Learners can also use Google Earth on the Internet.
- Read through the section, 'How is urbanisation affecting the world population?' (page 196) with learners.

#### Activity 1

- Learners can work in pairs. They refer to the bar graph in Figure 5.1.1 (page 196) and complete the questions.
- Take feedback from learners and correct if necessary. Let other learners check their answers while they listen to the feedback.
- Go through the sections, 'What is an urban settlement?' (page 197) and 'How did urban settlements begin and how have they developed?' (page 197) with Learners.

#### Activity 2

- Learners work in pairs on Activity 2.
- Learners join with another pair to mark their work.
- Finally, check work as a class.
- Refer to Figure 5.1.7 and read the features, 'What is a city?' (page 200) and 'Cities of the World' (page 201) with learners.

#### Activity 3

Learners work in pairs or as a class to discuss the questions.



### Lesson 2

- Read through the section, 'How do site and situation affect the location of urban settlements?' (page 202) with learners.
- Make sure learners understand the concepts of site and settlement.

#### Activity 4

- Learners work on their own to complete the questions in Activity 4.
- Check work as a class.
- Read through the section, 'How are urban settlements classified according to function?' (page 203) with learners.

#### Activity 5

- Learners work in pairs to do the two activities.
- Check work as a class.

#### Activity 6

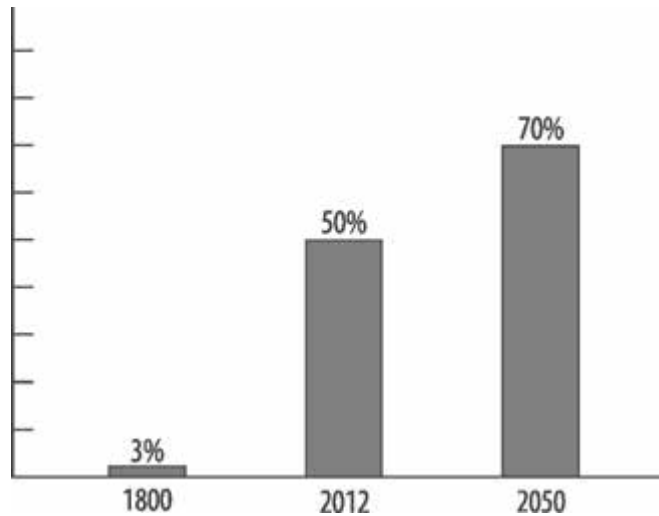
- Learners work on their own on this activity and can finish it for homework.
- Check work as a class.

### Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.

**Activity 1** (Learner's Book, page 197)

- 60%
  - (ii) two in every three people (67% is two in three, but 60% is closer to two in three than 50%, which is one in two)
  - Africa and Asia
- Learners present the data in a line graph, or bar graph, or pie chart. Ask pairs to draw up their different types of graphs on the board.



- Take in the paragraphs and graphs for marking.

**Activity 2** (Learner's Book, page 200)

- 2 250–2 000 years ago
- Luxor on Nile River; Ur at confluence of Tigris River and Euphrates River; Harappa and Mohenjo-Daro on Indus River; Chengchou and Anyang on Yellow River
  - Jordan River
  - Turkey
- 1497–1610; or mainly the 1500s

**Activity 3** (Learner's Book, page 201)

- The answers to the discussion question will differ. Make sure that learners refer to the mind-map in Figure 5.1.2 (page 197) as a starting point. Here is an example: A city is a settlement with a high concentration of people, buildings and infrastructures. People who live in a city have diverse occupations and a city offers a wide range of goods and services.
- What drives the growth of cities?* For example, migration of people to cities in quest of employment, education and other opportunities; economic growth and development; tourism.  
*What makes a successful city?* For example, a city that is well-run/ administered and has good infrastructure (such as a good public transport system); a crime-free or safe city; a diverse city.  
*Do the advantages of living in a city outweigh the disadvantages?* One could argue that yes, the growth in urbanisation indicates that they do. One could also argue that the quality of life for the rural poor is generally better in the country than it is in an informal settlement.
- Tokyo, Guangzhou, Jakarta, Seoul, Shanghai, Mexico City, Delhi, New York City, São Paulo, Karachi, Mumbai, Manila, Los Angeles, Osaka, Beijing, Moscow, Cairo, Kolkata, Buenos Aires, Dhaka, Bangkok, Tehran, Istanbul, Lagos, Rio de Janeiro, London, Paris

**Activity 4** (Learner's Book, page 202)

1. night lights
2. a. concentrated in northern hemisphere  
b. sparse at the poles and the equator  
c. many big urban settlements on or near the coast
3. USA, Europe, India, Japan
4. North Africa and South Africa
5. Andes Mountains on west coast are inaccessible; major rivers have their mouths on the east coast.

**Activity 5** (Learner's Book, page 206)

1. c. i. Upington  
ii. Kroonstad  
iii. Newcastle  
iv. Nelspruit/Mbombela
2. a. i. Johannesburg, Bloemfontein, Cape Town (also Kroonstad, Beaufort West, Laingsburg, Paarl)  
ii. Cape Town, Port Elizabeth, East London (also George, Knysna, Richards Bay)  
iii. Durban, Pietermaritzburg, Johannesburg  
b. i. N8, N10  
ii. N14  
c. i. They connect the coastal towns with the towns of the interior; several road and railway networks lead to Johannesburg.  
ii. There is no coastal railway line equivalent of the N2 national road, linking the port cities.

**Activity 6** (Learner's Book, page 207)

1. a specialist town – for surfing and tourism, although it now also functions as a central place (offering goods and services) to the surrounding district
2. Site: On the southern Eastern Cape coast within a bay.  
Physical factors: The land is flat and low-lying. The sea is the main resource – for some fishing, surfing and tourism  
Infrastructure: Plenty of accommodation for tourists; restaurants, shops and a mall.  
Situation: Proximity: near to Port Elizabeth and N2 freeway; part of the Cacadau District.  
Accessibility: reasonably accessible – about 100 km from Port Elizabeth (which has an airport); just off the N2 which links Cape Town, Port Elizabeth, East London and Durban.

## Informal assessment

### Activity 1

- Take feedback from learners and correct if necessary. Let other learners check their answers while they listen to the feedback.
- Take in learners' paragraphs and graphs for marking.

### Activity 2

Learners work in pairs to assess their answers against the answers you provide. This activity lends itself to input from the class.

### Activity 3

Ensure that all learners are participating in the discussions and demonstrate an understanding of the work.

#### Activity 4

Supply the correct answers (see above) and discuss these with the class. Check that all learners understand the content and concepts covered.

#### Activity 5

Check work as a class.

#### Activity 6

Supply the correct answers (see above) and discuss these with the class. Check that all learners understand the content and concepts covered.

#### Remedial

Ask those learners who need extra assistance with the concept of urban settlements, to use an atlas or encyclopaedia to identify factors that affect the choice of a particular settlement.

#### Extension

Ask learner to find new examples of urban areas in South Africa or southern Africa that are classified according to one of the following: central place; trade and transport towns or cities; and specialised towns or cities.

Learner's Book  
pages 208–213  
Duration: 2 hours

## UNIT 2

## Urban hierarchies

TERM 2, WEEK 5

### Curriculum and Assessment Policy Statement (CAPS) content

#### Urban hierarchies

- The concepts of urban hierarchy, central place, threshold population, sphere of influence and range of goods
- Lower- and higher-order functions and services
- Lower- and higher-order centres

#### Resources

- Learner's Book pages 208–213
- Websites (optional):
  - <http://www.s-cool.co.uk/gcse/geography/settlements/revise-it/urban-hierarchies>
  - [http://en.wikipedia.org/wiki/Urban\\_hierarchy](http://en.wikipedia.org/wiki/Urban_hierarchy)
  - [http://en.wikipedia.org/wiki/Urban\\_hierarchy\\_in\\_Brazil](http://en.wikipedia.org/wiki/Urban_hierarchy_in_Brazil)
  - [http://en.wikipedia.org/wiki/Central\\_place\\_theory](http://en.wikipedia.org/wiki/Central_place_theory) Group-Settlement-Course.pdf
- Set of class atlases
- Large wall map of South Africa

#### Preparation

- Read through and familiarise yourself with the content.
- Locate the places mentioned in the text in the Learner's Book.

## Teaching the unit

### » Lesson 1

- Read through the section, 'What is an urban hierarchy?' (page 208) with learners.
- Use the atlases or the wall map to locate cities in the urban hierarchy and central place cities in South Africa.
- Ask learners to suggest reasons why sometimes a primate city is not the capital of the country, e.g. Lagos in Nigeria, Sao Paola and Rio de Janeiro in Brazil, and Johannesburg in South Africa.
- Explain that often the planning associated with the needs of a capital city, such as embassies and government offices means that a new city is planned that will become the new capital of a country. Another reason may be a planned policy of decentralisation. Canberra in Australia is an example of a planned federal capital, but it is not the primate city of Australia, the same as Washington DC, in the USA.

#### Activity 1

Learners work on their own to read the case study, 'South Africa's urban hierarchy' (pages 208–209). They then complete the questions.

### » Lesson 2

- Read through the section, 'What is central place theory?' (pages 210–211) with learners.
- Make sure that learners understand the concepts of central place, sphere of influence, threshold population, and range of goods.

#### Activity 2

Learners work in pairs or on their own to complete the activity.

Read the section, 'The order of functions in the urban hierarchy' (pages 211–213) with learners.

#### Activity 3

Learners work on their own to complete the activity.

## Answers

### Activity 1 (Learner's Book, page 210)

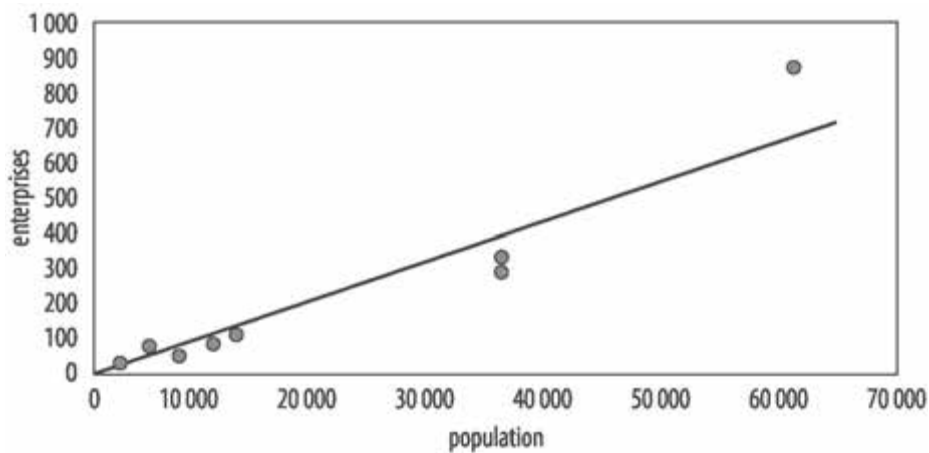
1. a. East London  
b. Port Elizabeth  
c. Bloemfontein  
d. Pretoria  
e. Durban
2. Johannesburg
3. Johannesburg, Cape Town, and possibly Durban; largest populations and dominant/major cities
4. a. Stellenbosch; Lephale; Khara Hais  
b. Stellenbosch; Ellisras; Upington  
c. Western Cape; Limpopo; Northern Cape
5. size, i.e. population

**Activity 2** (Learner's Book, page 211)

1. a. Upington, Kakamas, Pofadder  
b. The bigger the population of a central place, the bigger its sphere of influence will be.  
c. The bigger the sphere of influence, the greater the range of goods.
2. Gauteng has a much higher population density than the Northern Cape. Although Gauteng's area is more than 20 times smaller, its population is 10 times bigger. This means central places in Northern Cape are further apart and smaller.

**Activity 3** (Learner's Book, page 213)

1. a. i. Here is a likely answer – from most often to least often:  
bread; petrol; toothpaste; stamps; movie tickets; shoes; TV  
ii. Here is a likely answer – it depends, of course, on how many stamps one buys at a time; the price of the shoes and whether one fills up the car tank with petrol: stamps; bread; toothpaste; movie tickets; shoes; petrol; TV
  - b. Note that some items can fall into more than one category.  
low-order goods: bread, stamps  
middle-order goods: toothpaste, shoes  
higher-order goods: movie tickets, TV
- 2.



**Informal assessment**

**Activity 1**

- Take feedback from learners and correct if necessary. Let other learners check their answers while they listen to the feedback.
- The answers lend themselves to class discussion.

**Activity 2**

Learners work in pairs to assess their answers against the answers you provide. This activity lends itself to input from the class.

**Activity 3**

Take in learners' work for marking and to check that they understand the content and concepts covered.

### Remedial

Ask those learners who need extra assistance with the concept of urban hierarchies, to write their own definitions or to draw a diagram to show their understanding of these terms: urban hierarchy; central place; threshold population; sphere of influence; range of goods; lower- and higher-order functions and services; lower- and higher-order centres.

### Extension

Ask learners to design their own 'test' which includes 10 questions on urban hierarchies. Then let them work in pairs to give each other their 'tests'.

Learner's Book  
pages 214–226  
Duration: 4 hours

## UNIT 3

## Urban structure and patterns

TERM 2, WEEK 6

### Curriculum and Assessment Policy Statement (CAPS) content

#### Urban structure and patterns

- Internal structure and patterns of urban settlements: land use zones; concept of urban profile; and factors influencing the morphological structure of a city
- Models of urban structures, such as multiple-nuclei model, the modern American-Western city, the Third World city and the South African city
- Changing urban patterns and land use in South African cities

#### Resources

- Learner's Book pages 214–226
- Websites (optional):
  - [http://en.wikipedia.org/wiki/Urban\\_structure](http://en.wikipedia.org/wiki/Urban_structure)
  - <http://www.martinsaphug.com/learn/units/urbanization/urban-structure-models>
  - [http://www.course-notes.org/Human\\_Geography/Outlines/Human\\_Geography\\_Culture\\_Society\\_and\\_Space\\_8th\\_Edition\\_Textbook](http://www.course-notes.org/Human_Geography/Outlines/Human_Geography_Culture_Society_and_Space_8th_Edition_Textbook)
  - <http://www.sustainabledevelopmentnetwork.com/pdf1/52783458-A-Model-for-South-African-Urban-Development-in-the-21st-C>
- Atlases or wall map of South Africa
- Google Earth, available on any 3G device

#### Preparation

- Read through and familiarise yourself with the content.
- Locate the towns and cities referred to in the text in the Learner's Book.

### Teaching the unit



#### Lesson 1

- This is an interesting part of the syllabus. The examples of internal structures and patterns of urban settlements, the land use zones, and urban profile can be seen in any ride or route between home and school.
- Read the section, 'What are the internal structures and patterns of urban settlements?' (page 214) with learners. Make sure that they understand the concepts, land use zones, Central Business District, residential zone, industrial zone, transition zone and rural-urban fringe.



### Activity 1

- This activity could lend itself to class discussion about land use zones and where the different zones are most likely to be found.
- Ask your learners to plot their route between home and school, and ask what they can see in terms of urban profile, land use, and any factors that may have influenced the shape of their town or city.

### Activity 2

- Go through the section, 'Urban profile' (page 216) with learners.
- Then ask them to do Activity 2.
- Go through the section, 'Factors influencing the morphological structure of a city' (page 216–218) with learners.

### Activity 3

Learners read the two features about Cape Town and Johannesburg and Pretoria on page 218, and then discuss the questions – as a class or in small groups or pairs.



## Lesson 2

- Go through the section, 'What are models of urban structure?' (pages 219–221) with learners.
- Make sure that learners understand all the concepts – concentric zone model, sector model, multiple-nuclei model, decentralisation, suburbanisation, edge city, and township. Ask for examples of each.

### Activity 4

- Learners work in pairs on the activity.
- Go through the section, 'How have urban patterns and land use in South African cities changed?' (pages 221–226) with learners.
- Again, check understanding of concepts, such as invasion and succession, urban decay, urban renewal, gentrification, and gated community. Ask for examples of each.

### Activity 5

- Learners re-read the case study on page 225 and complete the questions on their own.
- These questions also lend themselves to class discussion.

## Answers

Here are the suggested answers for the activities in this unit. Use these as a guide. Recognise and give credit for work where extra information or originality is apparent in the learners' answers.

### Activity 1 (Learner's Book, page 216)

1. A = heavy industrial zone  
B = high-income residential area  
C = Central Business District  
D = light industrial zone  
E = high-density/low-income residential area  
F = transition zone
2. a. transition zone on the rural-urban fringe  
b. high-income residential area  
c. transition zone on the rural-urban fringe/edge cities

- d. transition zone on the rural-urban fringe
- e. heavy industrial zone
- f. CBD

**Activity 2** (Learner's Book, page 216)

1.
  - a. the density of buildings increases
  - b. the height of buildings increases
  - c. the age of buildings increases
  - d. roads and pavements get busier
  - e. transport routes converge
2. An area planned to conserve or maintain open countryside, or natural features that can sustain indigenous plant, animal and bird life and remain free from infrastructure

**Activity 3** (Learner's Book, page 219)

1.
  - a. the mountain feature (Table Mountain), and the sea
  - b. access to space to expand until it almost merges with Pretoria
2. The CBD has more functions and services than elsewhere; has many commercial and retail activities; has limited space; limited and expensive accommodation.

**Activity 4** (Learner's Book, page 221)

1. gridiron in the new city; irregular unplanned in the old city
2.
  - a. We have edge cities; suburbanisation; decentralisation; multiple nuclei.
  - b. We have colonial history; dual city structure (one traditional CBD and one modern); informal settlements or squatter settlements.

**Activity 5** (Learner's Book, page 226)

1. residential and transition around the CBD
2. invasion and succession
3. overcrowding; filth; urban decay; danger
4. It is an initiative of social upliftment; it makes people accountable for maintaining buildings; it makes the city accountable for service obligations.
5. Cities have dense populations; high-rise buildings; noise and traffic congestion. The City needs to keep its pavements clear and safe; its streets litter free; well-lit; patrolled by police for security; CCTV as a deterrent to law-breakers; provide services such as transport and recreation. The inhabitants have to maintain their buildings; upgrade the facilities when needed; prevent pollution or littering.

## Informal assessment

### Activity 1

Have a class discussion and observe who is and who is not participating. Support or encourage those who are not participating.

### Activity 2

Learners swap books and assess each other's work as you call out the answers.

### Activity 3

Discuss the questions as a class. Take note of the progress learners are making.

#### Activity 4

Learners work in pairs to assess their answers against the answers you provide. This activity lends itself to input from the class.

#### Activity 5

Take in learners' work for marking and to check that they understand the content and concepts covered.

#### Remedial

Ask learners to plot their route between home and school. Then ask them to write or draw what they can see in terms of urban profile, land use, and any factors that may have influenced the shape of their town or city.

#### Extension

- Ask learners to refer to Google Earth to check the model of the urban structure of the towns and cities in South Africa, compared with cities in the United States or elsewhere in the world. They should list the similarities and differences.
- Ask the learners to discuss why urban patterns and land use are this way in South Africa, and how urban patterns and land use changed after 1994.

Learner's Book  
pages 227–238  
Duration: 5 hours

## UNIT 4

## Urban settlement issues

TERM 2, WEEKS 7–8

### Curriculum and Assessment Policy Statement (CAPS) content

#### Urban settlement issues

- Recent urbanisation patterns in South Africa
- Urban issues related to rapid urbanisation: lack of planning, housing shortage, overcrowding, traffic congestion and problems with service provision
- The growth of informal settlements and associated issues: case studies from the world and South Africa
- Case studies that show how selected urban areas in South Africa are managing urban challenges, and handling environmental, economic, and social justice concerns

#### Resources

- Learner's Book pages 227–238
- Websites (optional):
  - <http://www.geography.learnontheinternet.co.uk/topics/urbanprobsledcs.html>
  - <http://en.wikipedia.org/wiki/Urbanization>
  - <http://onlinegeography.wikispaces.com/U+-+Rapid+urbanisation+LEDC>
  - <http://www.unhabitat.org/pmss/getElectronicVersion.aspx?nr=2935&alt>
- Wall map of the world; map of South Africa; set of class atlases.
- 3G devices to research Google Earth
- Newspapers that have information on urban problems

## Preparation

Read through and familiarise yourself with the content.

## Teaching the unit



### Lesson 1

---

- Ask learners what they think has been the recent urbanisation pattern in South Africa, and why.
- Read the section, 'What are recent urbanisation patterns in South Africa?' (pages 227–228) with learners.

#### Activity 1

- Ask learners to complete the answers on their own.
- These questions about recent urbanisation patterns in South Africa lend themselves to class discussion.
- Ask learners what issues or problems they think are associated with rapid urbanisation. Write their ideas up on a mind map on the board.
- Explain that the problems associated with rapid urbanisation can be seen in poor service delivery. There are complaints about housing shortages, inadequate transport services, failure by municipalities to maintain crime-free, litter-free, well-lit urban areas. The national government is often in the news because of a failure to deliver on targeted plans for the growing urban populations. These problems are global and common to all urban settlements.
- Read the section, 'What urban issues are related to rapid urbanisation?' (pages 229–230) with learners.

#### Activity 2

Use the questions for class discussion.

#### Activity 3

- Ask learners to read the feature, 'Houses for everyone' (page 231), and the case study, 'The sad tale of low-cost housing in Vukani' (page 231). They should have a class discussion using the questions to guide their discussion.
- Go through the section, 'How have informal settlements grown and what are the associated issues?' (pages 232–235) with learners.



### Lesson 2

---

#### Activity 4

- Learners do this activity on their own.
- Ask learners to read out their TV documentary or act it out for the class.
- Ask learners what they think can be done/or what is being done to manage urban challenges.
- Go through the section, 'What can we learn about managing urban challenges and handling environmental, economic and social justice concerns from case studies?' (pages 236–238) with learners.

#### Activities 5 and 6

Learners re-read the case studies and write answers to the questions.

## Answers

### Activity 1 (Learner's Book, page 229)

- black population group; democracy made it easier for black people to get better jobs in the urban areas, and attracted people from Africa, Asia and India
  - The trend continues to show an increase in the rate of urbanisation.
- metropolitan city
  - metropolitan city
  - The difference between the figure for the in-migration and the out-migration is the net migration rate. The net migration rate for the metropolitan city is 2,5%.
- Answers will vary as this will be different in a city, for example, than in a small rural settlement.

### Activity 2 (Learner's Book, page 230)

- There are no wrong answers. Try to encourage learners to think of solutions to rapid urbanisation, such as better transport systems (e.g. MyCity bus in Cape Town); dedicated fast lanes for buses and taxis in peak hour; pedestrianised streets in cities; one-way road systems in cities to help with the flow and amount of traffic; prohibiting large lorries and buses from entering urban areas and residential areas during certain peak hours to prevent noise.
- It is important for learners to realise that planning is a response to demand, but that it always lags behind demand, so that service delivery – even if planned – lags behind the daily needs of people. A well-run, well-serviced community acts as a magnet to migrants coming into the city. This creates greater challenges for the planners.

### Activity 3 (Learner's Book, page 232)

- Encourage learners to think about the problems that arise from giving tenders to friends, rather than to reputable building companies; or to cheap contractors rather than to more expensive but better-known contractors.
- Ask them what type of temptations could cause tenders to be awarded to contractors who are irresponsible.
- Talk about the success in having provided for almost half of what was needed according to the 1996 census. Explain the cost in finding available vacant land for housing in city areas, and the number of houses that never seems to lessen, as more people move into the cities.
- Speak about the challenges of low-cost housing, including irregularities with cheap materials; poor plumbing work; dangerous electrical connections; inferior bricks; leaking roofs; and leaking gutters.

### Activity 4 (Learner's Book, page 235)

There is no answer to this activity.

### Activity 5 (Learner's Book, page 238)

- Answers could include: safe; efficient; alternative to cars in the city; regular; not too expensive.
- The City's five goals are to be: the opportunity city; the safe city; the caring city; the inclusive city; and the well-run city. It can do this by the following actions:

- ensure that the metropolitan area is physically connected by public transport systems so that every resident can benefit from what the city has to offer
- improve the delivery rate of formal housing opportunities
- increase investment through planning and marketing
- start an apprenticeship programme to the Water, Sanitation, Electricity, Stormwater, Solid Waste, Refuse Removal and Roads Departments. These apprentices will meet the demand of the labour market, using the training the City provides either to become skilled technicians employed by the government, or to move as young people with new qualifications into the private sector
- set up of free call booths with the City's complaints number in the poorest communities, so that everyone can be assured of the fastest response time, no matter where they live
- expand its construction of the fibre-optic network, providing broadband infrastructure to all communities.

**Activity 6** (Learner's Book, page 238)

Contributions can include: recycling; tree planting; peri-urban agricultural schemes aided by municipalities.

**Informal assessment**

**Activity 1**

Ask learners to complete the answers on their own. Take in their books to assess their progress.

**Activity 2**

Assess the progress learners make in contributing to the class discussion, and take note of learners who may need remedial work.

**Activity 3**

Assess the progress learners make in contributing to the class discussion, and take note of learners who may need remedial work.

**Activity 4**

Assess learners' understanding of the concepts through their TV documentary.

**Activities 5 and 6**

Take in learner's books to assess their progress.

**Remedial**

Ask learners to copy and complete the table below to do with urban problems, causes and solutions. They can share their answers in pairs.

	Problems this causes	Effect / consequence	Solution
congestion			
urban decay			
centralisation			

**Extension**

Ask learners to write a paragraph explaining the causes and effects of urban problems, and describing potential solutions.

	<b>MODULE 6</b>	
<b>TERM 2</b> Learner's Book pages 239–258 Duration: 5 hours Lessons: 10 half-hour lessons or 5 hour long lessons	<b>RURAL AND URBAN SETTLEMENTS: GEOGRAPHICAL SKILLS AND TECHNIQUES</b>	

### Curriculum and Assessment Policy Statement (CAPS) content

#### Mapwork skills

- Applying map skills and techniques: scale, contours and cross-sections
- Map and photo interpretation, including reading and analysis of physical and constructed features

#### Geographical Information Systems (GISs)

- GIS concepts: remote-sensing and resolution
- Spatial and attribute data; vector and raster data
- Data standardisation, data sharing and data security
- Data manipulation: data integration, buffering, querying and statistical analysis
- Application of GIS by Government and the private sector, related to weather and settlement topics
- Developing a 'paper GIS' from existing maps, photos or other records on layers of tracing paper

#### Key geographical skills and techniques

- applying map skills and techniques to address settlement issues
- map and photograph interpretation, including reading and analysis of constructed features
- understanding GIS concepts, including remote sensing and resolution, different kinds of GIS data, and the manipulation, integration and statistical analysis of data
- applying GISs in a practical way to address settlement-related questions – by government and by the private sector
- developing a paper GIS from existing maps, photographs or other records on layers of tracing paper

#### Key words/concepts

settlement geography; morphological structure; spatial data; attribute data; nominal data; ordinal data; interval data; ratio data; vector data; raster data; integrate; buffering; coverage features; outliers; non-spatial statistics; spatial statistics; descriptive statistics; inferential statistics

Learner's Book pages 240–246 Duration: 3 hours	<b>UNIT 1</b>	<b>Mapwork skills</b>  <b>TERM 2, WEEK 8</b>
--	---------------	--

### Curriculum and Assessment Policy Statement (CAPS) content

#### Mapwork skills

- Applying map skills and techniques: scale, contours and cross-sections
- Map and photo interpretation, including: reading and analysis of physical and constructed features

## Resources

- Learner's Book pages 240–246
- Websites (optional):
  - For information on synoptic charts: <http://www.weatherphotos.co.za/>
  - For information on topographic maps: [http://en.wikipedia.org/wiki/Topographic\\_map](http://en.wikipedia.org/wiki/Topographic_map)
  - <http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)

## Preparation

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules, as this skills development module requires a theoretical background in physical geography.
- The last website listed above is also highly recommended.
- Refer back to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this module builds.

## Teaching the unit

### » Lesson 1

- The lesson deals primarily with mapwork skills as applied to settlement geography.
- Ask learners to differentiate between urban and rural settlements.
- Remind them that settlements often display certain patterns, and that these will show on maps, aerial photos or satellite images.
- Go through the section, 'How do rural and urban settlements differ spatially when shown on maps and photographs?' (pages 240–241) with learners.
- Should there be a need to reinforce the theory, return to Module 3.

### Activity 1

- Explain that the lesson is essentially a skills-based (rather than theory-based) one, and that this hands-on activity is based on a topographic map extract of Port Shepstone (page 242).
- Explain that the map was chosen because of the variety of settlement types shown (urban and rural).
- Some settlements are clustered, some are dispersed.
- The physical landscape has an impact on settlement patterns.

### » Lesson 2

- Once again, ask learners to differentiate between urban and rural settlements.
- Ask learners why maps, aerial photos and satellite images are so important in settlement geography.
- Explain that this lesson concentrates on urban settlement.
- Go through the section, 'How are physical and constructed features of a landscape represented on maps?' (page 245) with learners.
- Should there be a need to reinforce the theory, return to Module 3.



### Activity 2

- This activity continues with a skills-based (rather than theory-based) format, with this hands-on activity involving reading the topographic map extract of Bloemfontein (page 244).
- The map shows virtually exclusively urban settlement, and transport patterns are also mentioned.



## Lesson 3

---

- Ask learners how they are able to read a map, which is simply a representation of reality (in the same way that words on a page represent language).
- After some discussion, point out that maps have their own language, in the form of scales, contour lines and, most importantly, map symbols.
- Explain what the REFERENCE (VERKLARING) on a topographic map is.
- Go through the section, 'How are physical and constructed features of a landscape represented on maps?' (page 245) with learners.

### Activity 3

- This activity involves working on, and with, a diagrammatic map (see page 246 of the Learner's Book).
- Both form (what a settlement looks like from the air) and function (what purpose does the settlement serve, or what role does it fulfil?) are addressed.

## Answers

### Activity 1 (Learner's Book, page 241)

1. Learners must pinpoint the Port Shepstone area on a map of South Africa (an atlas can be used). Port Shepstone is in KwaZulu-Natal.
2. undulating (up-and-down) landscape
3. a. rural (isolated)  
b. urban  
c. rural (clustered)  
d. urban  
e. rural (clustered)  
f. rural (dispersed)
4. A linear settlement pattern may develop parallel to a road, or railway line, or even a river. There are a few examples along rural roads on the map.
5. This is not easy terrain. Incised rivers and tributaries mean steep slopes, which makes road building difficult. Settlements are situated on valley bottoms or on hill crests.
6. More difficult; the Mzimkhulu River is a barrier to transport. It can only be crossed where there are bridges.
7. Between roughly 30°25' and 30°30' East and 30° 41 and 30° 42 South are the Kurnalpi Estates. There is other cultivated land along the river. Sugarcane is grown here.
8. There is no heavy industry and very little other industrial development. The sugar mill may provide a few hundred jobs, but that is all. There is probably a movement of people towards Port Shepstone, but certainly not enough employment. People will move out of the area to Durban-Pinetown and other big urban areas looking for work.

**Activity 2** (Learner's Book, page 243)

1. Leeuberg, at 1 603,8 m (highest)
2. Heidedal (extreme right, half way), 1 370 m (lowest)
3. sewerage works on the Bloemspruit, because cold air drains downslope at night and accumulates in low-lying hollows and river valleys
4. This is a built environment, with no real evidence (besides in the south-west) of rural settlement; farmland has been taken over by urban sprawl.
5. Learners must look at the grid pattern on the historical map and find the same features on the topographic map.
6. grid-iron or rectangular
7. Look at density of development and street patterns, and the presence of green belts and sports fields, and the names of the suburbs. Previously 'white' suburbs will have larger street blocks (less dense road system) and 'white' names, and more open spaces than traditionally 'black' suburbs or townships.
8. principally, the railway line and transport infrastructure
9. to the south-east of the city; also acting as a buffer between the townships and the CBD
10. due west
11. so that it would not split (divide) the suburbs to the west from the city, though this has subsequently happened as the city has expanded westwards OR not to the east, because then it will move past the industrial side
12. radial; transport routes (particularly roads) generally radiate outward from the centre of the city

**Activity 3** (Learner's Book' page 245)

1. A = T-shaped  
B = isolated  
C = circular  
D = crossroads  
E = linear
2. The circular and crossroads are urban (continuous built up areas), the others more rural. / B – rural; rest – urban
3. A is a resort settlement at the end of the road in the mountains (or it could be a mining settlement).  
B is a gateway or strategic settlement (guard houses or forts guarding access to the plain in the south.  
C is probably a trade and transport city (on the river) which has expanded over time.  
D is a typical crossroads (trade) settlement.  
E is rural settlement, probably with farms backing onto the river for irrigation water.
4. Yes, there are mountainous areas indicated on the map which would act as topographical barriers to transport, particularly shortest routes.

**Informal assessment****Activity 1**

This is a fairly lengthy activity. It is suggested that learners work with a partner or in small groups to cross-check and discuss answers, before having a general class report-back session.

### Activity 2

Follow a similar assessment strategy to the previous activity. Learners can reinforce one another's map reading skills by working together.

### Activity 3

You can provide answers and learners mark their own answers.

### Remedial

To help learners develop topographic map reading and interpretation activities where they are lacking, provide your own questions based on the maps of Port Shepstone (page 242) and Bloemfontein (page 244).

### Extension

If your school has a set of topographic maps for teaching, ask learners to work in pairs to devise their own questions (rather than answers) based on a portion of a particular map. These could include questions on applying map skills and techniques to topographic maps, GISs and atlases. The emphasis should be on settlement issues.

Learner's Book  
pages 247–258  
Duration: 2 hours

## UNIT 2

## Geographical Information Systems (GISs) (appropriate to rural and urban settlement)

TERM 2, WEEK 9

### Curriculum and Assessment Policy Statement (CAPS) content

#### Geographical Information Systems (GISs)

- GIS concepts: remote-sensing and resolution
- Spatial and attribute data; vector and raster data
- Data standardisation, data sharing and data security
- Data manipulation: data integration, buffering, querying and statistical analysis
- Application of GIS by Government and the private sector, related to weather and settlement topics
- Developing a 'paper GIS' from existing maps, photos or other records on layers of tracing paper

#### Resources

- Learner's Book pages 247–258
- Websites (optional):
  - For information on synoptic charts: <http://www.weatherphotos.co.za/>
  - For information on topographic maps: [http://en.wikipedia.org/wiki/Topographic\\_map](http://en.wikipedia.org/wiki/Topographic_map)
  - <http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)

#### Preparation

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules, as this skills development module requires a theoretical background in physical geography.
- The last website listed above is also highly recommended.

- Refer back to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this module builds.

## Teaching the unit

### » Lesson 1

---

- The lesson focuses on concepts and terminology used in GIS.
- Begin by asking learners what GIS stand for, what a GIS actually is, and what it can (and cannot) do.
- Emphasise that, to apply GIS, a theoretical background and understanding of certain terms is very important.
- Go through the following sections with learners: ‘What is the difference between GIS, remote sensing and data resolution?’ (page 247); ‘What is meant by spatial and attribute data; and vector and raster data?’ (pages 247–248); ‘What is meant by data standardisation, data sharing and data security?’ (page 249); ‘What is meant by data manipulation?’ (pages 249–251).

#### Activity 1

- Activity 1 is an example of a very straightforward spatial challenge where GIS could be employed.
- It involves decision-making based on set criteria and it asks learners to strategise (in which order should new stores be built?).

### » Lesson 2

---

- Explain that statistical analysis is part of GIS.
- Explain to learners what is meant by statistics.
- Ask learners why statistics and statistical data are necessary. (Answer: because dealing with thousands of individuals is impossible; we need to know the ‘average’ in many cases.)
- Go through the sections on statistical analysis (pages 252–255) and lead learners into thinking more about statistics, via the activities.

#### Activity 2

- The activity deals with a simple GIS map and distribution patterns to show that GIS maps can assist in determining whether distribution patterns exist and what those patterns are.
- Questions are asked about the distribution of schools in a particular town.

#### Activity 3

- Learners are asked to match up basic statistical concepts with their correct meanings.
- These concepts are descriptive – they describe various properties of a set of data.
- The mean is the average (probably the best understood property of a statistical distribution) but learners also need to understand the concept of standard deviation.

#### Activity 4

- This is another paper GIS activity, based on a settlement and certain criteria.
- Learners must decide where they would site a new residential suburb.
- The technique of creating a paper GIS was explained in Module 3, Unit 4 – refer learners back to this unit for the steps involved.

### Answers

#### Activity 1 (Learner's Book, page 251)

1. no
2. Historical; this was where the original town started. Population; more people lived in these parts of town. Function; other areas were more commercial or industrial. Planning; it was thought these would be good locations for stores.
3. Yes, the service areas of some stores do overlap.
4. Maximum distance: 11,5 km    Minimum distance: 4,5 km
5. about 20 km
6. no, not quite
7. a. The west, north-west and Fair Valley are going to need stores soon.  
b. I would plan first: west (no store there at all at present); second: Fair Valley – an upmarket area, with buying power and expanding; last: north-west.
8. possibly, given that Fair Valley is so close; definitely within the next couple of years

#### Activity 2 (Learner's Book, page 253)

Yes, three clusters: around the CBD, in the west, and in the south. The CBD is probably the first area settled (inner city schools), followed by the other two areas. There are often historical reasons for this sort of pattern.

#### Activity 3 (Learner's Book, page 254)

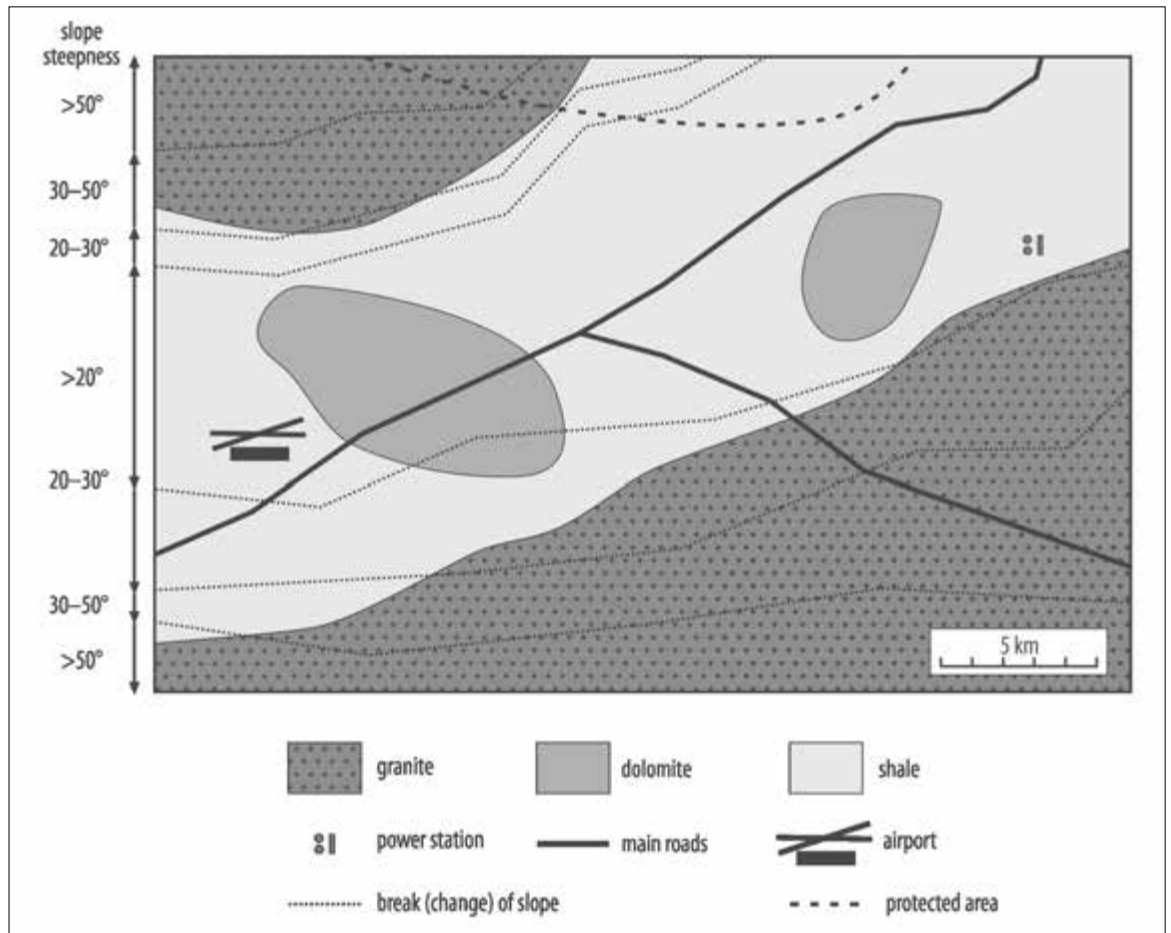
1.

Statistical measurement/parameter	Definition
first	in order, that which appears first, regardless of its value
last	in order, that which appears last, regardless of its value
maximum	highest value
minimum	lowest value
mean	average value (sum divided by occurrences)
range	difference between the highest and lowest values
standard deviation	average amount of deviation from the mean
sum	total of all the values
occurrences	number of values or observations in the dataset

2. This is a follow-up self-help activity, with no prescribed answers.

#### Activity 4 (Learner's Book, page 256)

The activity involves constructing a paper GIS to site a new residential area, based on the GIS overlays and criteria in the Learner's Book. Learners need to develop a final map which looks like the one below (page 104), on which to base their decision.



## Informal assessment

### Activity 1

After learners have attempted the activity individually (some measurements and use of scale are required) go through the answers, and ensure that learners understand what is meant by, for example, the service area for each shop, and a superstore, and why the latter is bigger.

### Activity 2

Move around the class to assess whether learners can recognise patterns or groupings, as well as account for these.

### Activity 3

Provide the answers and assess, by show of hands, how learners have coped with these statistical concepts.

### Activity 4

Provide learners with the final GIS template (above) after they have each constructed their own paper GIS. The siting of the residential area in light of the criteria can be discussed by the class.

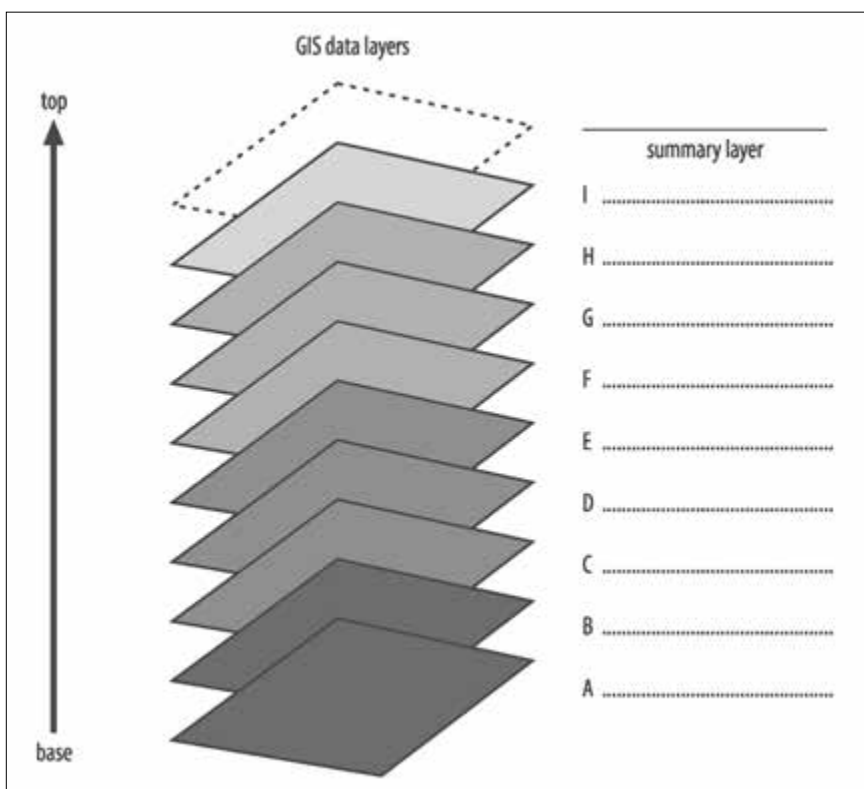
## Remedial

Run the true or false quiz given (page 106) as a snap verbal assessment. Answers are given as T for True and F for False. Ask for reasons for learners' answers. If there are gaps in knowledge, return to those sections in the Learner's Book.

<b>Spatial data</b> involves description, measurement and classification.	F
<b>Nominal data</b> is the lowest level of measurement.	T
<b>Ratio data</b> is the next level of measurement.	F
<b>Vector data</b> represents points, lines and polygons.	T
<b>Raster data</b> represents the landscape as a matrix of cells.	T
<b>Standardisation</b> of data helps to compare apples with apples.	T
<b>Data security</b> is not important.	F
<b>Government</b> never uses GIS, only the private sector uses it.	F
<b>Buffering</b> creates a zone around a point, line or polygon.	T
<b>Statistics</b> are useful for working with data sets.	T

### Extension

Ask learners to suggest their own GIS layers, and to pose a problem to be solved, based on the following diagram:



### Assessment Task 2:

For information on how to assess the learners' completed tasks, please see pages 177–178 in the Formal Assessment section of this Teacher's Guide.

Learner's Book  
pages 262–265

## REVIEW

TERM 2, WEEK 9

These activities provide an opportunity for learners to consolidate concepts and skills learnt in Term 2. Learners can complete them in class or as homework. It is suggested that they complete the activities individually as a means of self-assessment.

You can write the answers on the board for the learners and/or call them out where more appropriate. However, if possible, it is suggested that you photocopy the answers and give them to the learners so that they have them for revision purposes.

**Activity 1** (Learner's Book, page 262)

1. the exact physical location of the settlement
2. on fertile, alluvial plains between and alongside the rivers of present-day Turkey, Syria and Iraq – the Tigris and Euphrates Rivers; on the fertile, alluvial plains of the Indian sub-continent – the Ganges and Indus Rivers; along the banks of the Nile River in Egypt
3. fertile soil; river for transport; water for humans, animals and crops
4. A – accessibility; B – relief and route of floods; C – accessibility; D – dry (land) settlements, away from marshland and floods
5. (1) defence factors = building a town with a fort on a hill overlooking the surrounding areas; (2) resources for building, e.g. close to forests or a quarry for stone
6. a. A rural settlement: is one found in an undeveloped, sparsely populated countryside; has few functions, few services, and low-rise buildings; mainly agricultural or primary activities.  
b. An urban settlement: is densely populated; has many services, a well-developed infrastructure, many services, and high-rise buildings; mainly secondary and tertiary activities.

**Activity 2** (Learner's Book, page 263)

1. difficulty in agreeing to how large each rural population is (amount of people in each settlement); and difficulty in defining which services and functions, and how many, characterise a rural area
- 2.

Characteristics of rural settlements		Characteristics of urban settlements	
1	in the middle of undeveloped countryside	1	a highly organised developed area
2	associated with isolated farms, mining or fishing settlements, hamlets or villages	2	associated with towns, cities, metropolises and megaregions
3	low-rise buildings	3	high-rise buildings

**Activity 3** (Learner's Book, page 263)

1. pie graph
2. facts and forecasts about the percentage population in rural and urban areas in 1955 and in 2015
3. 82,76% increase in urbanisation forecast by 2015, from 1955
4. Urbanisation has continued to increase since the removal of the Group Areas Act and the former bantustans or rural 'homelands'. Urbanisation is greatest in Gauteng and the coastal towns of South Africa.
5. reliance on women to run the home and land; breakdown of family life; reliance on subsistence farming breaks down; women tend the elderly and the very young
6. GEAR; RDP; Agenda 21; Habitat Agenda; Millennium Development Goals; SDIs; IDZs; CRDP; RISDP
7. Commission on the Restitution of Land Rights

**Activity 4** (Learner's Book, page 264)

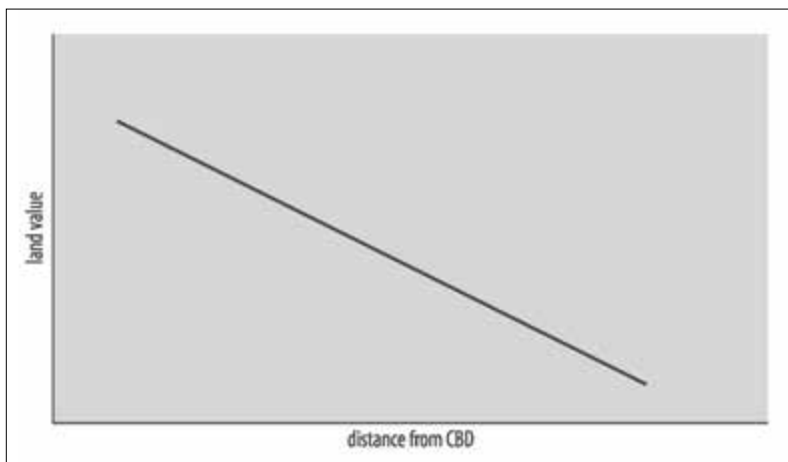
1. 360 years old
2. Cape Town
3. A dominant city – usually more than just the city with the highest population OR a city that has a significantly larger population (at least double) than the next largest city; city with important political and economic functions



4. No – Cape Town as a metropolitan area, has a population close to Johannesburg's. OR Yes – Johannesburg is South Africa's dominant economic centre.
5. a. agricultural = 1700s; b. mining = 1800s; c. manufacturing = 1900s
6. later 1900s
7. Cape Town's site = a bay (making for a suitable harbour) with a distinctive mountain as a landmark and source of fresh mountain water. Cape Town's situation = tip of Africa on the shipping trade route around the Cape between Europe and the East. This made it the ideal stopover and refreshment station. Ships stopped to take on fresh water and food supplies (which were grown in the Company Gardens and on nearby farms).
8. Kimberley
9. Any one of the port towns: Cape Town, Port Elizabeth, Durban; a place where transported goods have to be unloaded and one form of transport changed for another (for example, from wagon or train to ship).
10. Cape Town served as a gateway town for Europeans (the Portuguese, Dutch and the British) to the East. It also served as the gateway into South Africa's hinterland/part of the Cape.

**Activity 5** (Learner's Book, page 265)

1. A = CBD; B = industrial; C = residential; D = greenbelt
2. A = shops and offices; B = factories; C = houses
3. Central Business District
4. a. CBD; b. CBD/high income residential areas; c. residential area or outskirts; d. CBD
5. a.



- b. The CBD commands the highest prices for sale or rent of property because it is accessible to large numbers of people (the major public transport routes converge here).

**Mid-year examination:**

For information on how to assess the learners' answers, please see pages 179–201 in the Formal Assessment section of this Teacher's Guide.

**Activity 6** (Learner's Book, page 265)

1. a. place that provides goods and services to the surrounding area
2. a. the area from which it draws its customers  
b. it has a larger population and so it offers more goods and services  
c. range of goods
3. B
4. a. both A and B; b. B only
5. A

	<b>MODULE 7</b>	
TERM 3 Learner's Book pages 267–317 Duration: 25 hours Lessons: 50 half-hour lessons, or 25 hour long lessons	<b>ECONOMIC GEOGRAPHY OF          SOUTH AFRICA: GEOGRAPHICAL          KNOWLEDGE</b>	

## Curriculum Assessment Policy Statement (CAPS) content

### Structure of the economy

- Economic sectors (primary, secondary, tertiary and quaternary)
- Economic sectors' contribution to the South African economy: value and employment
- Use of statistical and graphical information

### Agriculture

- Contribution of agriculture to the South African economy
- The role of small-scale farmers and large-scale farmers
- Main products produced: home market and export market
- Factors that favour and hinder agriculture in South Africa, such as climate, soil, land ownership and trade
- The importance of food security in South Africa – influencing factors
- Case studies related to food security in South Africa

### Mining

- Contribution of mining to the South African economy
- Significance of mining to the development of South Africa
- Factors that favour and hinder mining in South Africa
- A case study of one of South Africa's main minerals in relation to the above points

### Secondary and tertiary sectors

- Contribution of secondary and tertiary sectors to the South African economy
- Types of industries, such as heavy, light, raw material orientated, market orientated, footloose industries, ubiquitous industries and bridge (break-of-bulk point) industries
- Factors influencing industrial development in South Africa, such as raw materials, labour supply, transport infrastructure, political intervention, competition and trade
- South Africa's industrial regions:
  - (PWV)-Gauteng, Durban-Pinetown, Port Elizabeth-Uitenhage, South Western Cape Metropole
  - Factors influencing their location
  - Main industrial activities
- Case studies from South Africa to illustrate the above

### Strategies for industrial development

- Overview of apartheid and post-apartheid industrial development strategies
- Concept and distribution of Industrial Development Zones (IDZs)

- Case studies of two Spatial Development Initiatives (SDIs)
- Issues associated with industrial centralisation and decentralisation

### Informal sector

- Concept and characteristics of informal sector employment
- Reasons for high informal sector employment in South Africa
- Challenges facing South Africa's informal sector
- Case studies to illustrate the above in the South African context

### Key geographical skills and techniques

- processing, interpreting and evaluating data
- identifying questions and issues
- collecting and structuring information
- making decisions and judgments
- deciding on a point of view
- suggesting solutions to problems
- working cooperatively and independently
- applying communication, thinking, practical and social skills
- interpreting sources
- using verbal, quantitative and symbolic data forms such as text, pictures, graphs, tables, diagrams and maps

### Key words/concepts

economically-active; Gross Domestic Product (GDP); slant; skew; commercial farming; subsistence farming; forward integration; backward integration; balance of trade; capital invested; capital intensive; agglomeration

Learner's Book  
pages 269–274  
Duration: 3 hours

## UNIT 1

## Structure of the economy

TERM 3, WEEK 1

### Curriculum and Assessment Policy Statement (CAPS) content

#### Structure of the economy

- Economic sectors (primary, secondary, tertiary and quaternary)
- Economic sectors' contribution to the South African economy: value and employment
- Use of statistical and graphical information

#### Resources

- Learner's Book pages 269–274
- Websites (optional):
  - [http://en.wikipedia.org/wiki/Economic\\_system](http://en.wikipedia.org/wiki/Economic_system)
  - <http://geography.about.com/od/urbaneconomicgeography/a/sectorseconomy.htm>
  - <http://www.investopedia.com/terms/s/sector.asp#axzz2BW9YXMA1>
  - [http://www.nationmaster.com/graph/eco\\_gdp\\_ppp-economy-gdp-ppp](http://www.nationmaster.com/graph/eco_gdp_ppp-economy-gdp-ppp)
  - <http://www.statssa.gov.za>
  - <http://data.worldbank.org/country/south-africa>
  - [http://www.finforum.co.za/economic\\_data\\_releases.htm](http://www.finforum.co.za/economic_data_releases.htm)

- The school library may have magazines and newspaper articles about the economy; economic structures; and statistical information about different sectors of the economy.

### Preparation

- Read through and familiarise yourself with the content.
- Familiarise yourself with different types of graphs and with reading information from statistics. This is basic to mathematical literacy, and should be understood by learners.

## Teaching the unit



### Lesson 1

- The concept of economic sectors is not new to learners. Write these four headings on the board: Primary; Secondary; Tertiary; and Quaternary economic sectors. Ask learners for a definition of each sector, and for a few South African examples for each sector.
- Discuss reasons why and how the contribution of these sectors in terms of value and employment is an indicator of the level of development of a country.
- If it is possible, access the websites that have statistical information for South Africa's economy; or use the newspaper (look at the 'Business section'). Ask the learners to create graphs to show information that you have accessed.
- Go through the section, 'What are the economic sectors?' (pages 269–270) with learners.

#### Activity 1

- Work as a class. Recap on the discussion you had previously about economic sectors and the South African examples.
- Ask learners to work on their own on question 2. Then take feedback.
- Work on questions 3 and 4 as a class.
- Go through the section, 'What do the economic sectors contribute to the South African economy with regards to value and employment?' (pages 271–272) with learners.
- The section analyses the contribution of the different economic sectors to the economy according to their monetary contribution and the total number of workers employed in each sector.
- Ensure that learners understand the concepts of GDP, GDP per capita, and GNP.

#### Activity 2

- Learners can work on their own or in pairs on the activity.
- Learners can either discuss/check their answers with another pair or as a class.



### Lesson 2

- Go through the section, 'How is statistical and graphical information used?' (pages 272–273) with learners.
- Discuss the advantages and disadvantages of statistical data, and how it mainly tells us about the average.
- Go through the section, 'Which factors favour and which hinder agriculture in South Africa?' with learners.

### Activity 3

- Learners work on their own to answer the questions.
- You can give this for homework if you are running out of time, but remember to check answers in the next lesson.

## Answers

### Activity 1 (Learner's Book, page 270)

1. It is the study of resources and their use in various economic sectors, which add value to the raw materials (e.g. by turning them into finished products). This process grows progressively more complex as more value is added, and this complexity influences the value of goods and services and the value of employment in a country.
2. a. primary: miner  
b. secondary: machinist  
c. tertiary: nurse/long-distance truck driver  
d. quaternary: Bio-technician/car designer/rugby player  
e. quinary: Minister of Basic Education
3. the third column on the far right
4. It is most developed because it has the smallest percentage participation in primary economic activities, and the largest percentage employed in tertiary economic activities. The more people involved in tertiary activities and sectors above this, the more developed the country is, because more value is added to products in these higher-ranking sectors.

### Activity 2 (Learner's Book, page 272)

1. Somalia; Central African Republic; Mozambique; Rwanda; Zimbabwe; South Africa
2. South Africa
3. A high percentage of people in the Central African Republic are employed in the primary extractive sector. At this level, there is little value added to their work or to the products they extract. There is a very small industrial base. Only a third of its people are employed in the tertiary sector.

### Activity 3 (Learner's Book, page 274)

1. to summarise data; to compare data from different sources; to forecast future outcomes; as a visual data bank
2. Statistics can be skewed or slanted to give a subjective interpretation if the following questions are not asked to test their validity: Who did the survey? What is being measured? Who was part of the sample? How were the questions asked? Who interpreted the data? Results could be incomplete, or not representative of the whole population.
3. a line graph
4. For comparison purposes, all the countries of the world use the same currency standard – the US dollar.
5. percentage of the workforce; sectors of the economy; time
6. It is visual; it compresses a lot of information into a small space; different factors involved in the economy can be put on one graph.
7. There is no explanation of the information given; the way in which the information was collected is not stated; there may have been bias or prejudice in the collection of the evidence in order to make the figures appear positive; there is no date given; there are no figures or percentages given; there is no time span given.

## Informal assessment

### Activity 1

Go through the answers with the class. Ask learners to offer answers.

### Activity 2

Ask pairs or small groups to offer answers.

### Activity 3

Take in the learners' answers and mark them. Give each learner feedback on how he/she is progressing.

### Remedial

For learners who struggled with this unit, ask them to revise it and to do the exercises on their own again. Go through the answers with these learners, or ask a stronger learner to help.

### Extension

Ask learners to find an article in a newspaper or magazine about the current state of the South African economy. Let them share with the class the data and any statistical information which they found.

Learner's Book  
pages 275–287  
Duration: 5 hours

## UNIT 2

## Agriculture

TERM 3, WEEKS 1–2

### Curriculum and Assessment Policy Statement (CAPS) content

#### Agriculture

- Contribution of agriculture to the South African economy
- The role of small-scale farmers and large-scale farmers
- Main products produced: home market and export market
- Factors that favour and hinder agriculture in South Africa, such as climate, soil, land ownership and trade
- The importance of food security in South Africa – influencing factors
- Case studies related to food security in South Africa

#### Resources

- Learner's Book pages 275–287
- Websites (optional):
  - [http://myfundi.co.za/e/Agricultural\\_perspectives\\_I:\\_Contribution\\_of\\_agriculture\\_to\\_the\\_South\\_African\\_economy](http://myfundi.co.za/e/Agricultural_perspectives_I:_Contribution_of_agriculture_to_the_South_African_economy)
  - [http://www.cfses.com/documents/agric&poverty/BHORAT\\_2011\\_Agriculture\\_in\\_Poverty\\_Reduction\\_in\\_South\\_Africa.pdf](http://www.cfses.com/documents/agric&poverty/BHORAT_2011_Agriculture_in_Poverty_Reduction_in_South_Africa.pdf)
  - [http://en.wikipedia.org/wiki/Agriculture\\_in\\_South\\_Africa](http://en.wikipedia.org/wiki/Agriculture_in_South_Africa)
  - [http://en.wikipedia.org/wiki/Food\\_security](http://en.wikipedia.org/wiki/Food_security)
  - <http://www.guardian.co.uk/global-development/food-security>
- The school library may have magazines and newspaper articles about agriculture in South Africa and about the importance of food security globally and nationally.
- A set of class atlases
- A wall map of South Africa; a world map

## Preparation

- Read through and familiarise yourself with the content.
- Locate the following:
  - South African provinces on a South African map
  - where South Africa's chief export markets are on the world map
  - the cold Humboldt Current off the coast of Peru, South America
  - the towns of Cape Town in the Western Cape (and Khayelitsha if it is shown)
  - the towns of Grahamstown and Peddie in the Eastern Cape.

## Teaching the unit

### » Lesson 1

---

- Go through the section, 'How does agriculture contribute to the South African economy?' (pages 275–276) with learners.
- There are important concepts in this unit that you need to ensure learners understand, such as: a dual agricultural economy; commercial farming; subsistence farming; forward and backward integration; direct and indirect contribution of farming to the economy of South Africa.
- Stress the importance of exports over imports.

#### Activity 1

- Learners work on their own or in pairs to complete this activity.
- Go through the section, 'What is the role of small-scale and large-scale farmers in the economy?' (pages 277–278) with learners.

#### Activity 2

- You can use this activity for class discussion. Work through the questions and answers together.
- Draw the table on the board and ask learners for input. Add to the table any points not mentioned (see 'Answers', on the next page).

### » Lesson 2

---

Go through the section, 'What are the main products produced for the home market and the export market?' (pages 279–280) with learners.

#### Activities 3 and 4

- Learners answer questions either individually or in pairs.
- Take feedback as a class.

#### Activity 5

Learners need to work on their own to write the report. They can do this activity for homework.

### » Lesson 3

---

Go through the section, 'Why is food security in South Africa important, and which factors influence it?' (pages 282–285) with learners.

### Activity 6

- You can use this activity for class discussion. It gives learners an opportunity to express opinions and ask questions.
- Draw the table (in question 5) on the board and ask learners to help you populate it.

### Activity 7

- Ask learners to read the case studies and to work in pairs or in small groups on Activity 7 – they might need to make time to meet after school hours to do this activity.
- Take feedback as a class.

## Answers

### Activity 1 (Learner's Book, page 276)

1.

Direct and indirect contribution of agriculture to the South African economy		
	Direct contribution	Indirect contribution
1	to GDP	purchase of items needed for agriculture
2	to GNP with exports	use of services to distribute products
3	to employment	employment for the informal sector

2. Agro-industries are distributors and packers of agricultural goods; suppliers of agricultural goods such as seeds, mechanical equipment, irrigation piping.
3. a. Forward integration is what happens after agricultural growth has taken place, such as packing the product, distributing the product, refrigerating the product, selling the product.
- b. Backward integration is what happens before the product appears, such as seed purchase, pesticide, insecticide and herbicide purchase, or the purchase of irrigation and mechanical implements.

### Activity 2 (Learner's Book, page 278)

1. A dual agricultural economy consists of both commercial and subsistence farming.
2. Small-scale farms: the size of the farm; financial turnover; output or productivity (in tonnage and in value); input or investment (in capital equipment, technology and agro-chemicals); the number of employees; value of fixed capital
- 3.

Comparison of commercial and subsistence agriculture			
	Area of operation	Commercial	Subsistence
1	Economics	market orientated	self-sufficiency
2		profit orientated	self-sufficiency
3		high output	low output
4		surplus production for market	limited or no surplus
5		high productivity	low productivity
6		high financial input	limited or no financial investment
7		employs managers and workers	no employment other than family



Comparison of commercial and subsistence agriculture			
	Area of operation	Commercial	Subsistence
1	Methods	modern techniques used	traditional farming methods used
2		sophisticated irrigation systems	no irrigation systems
3		hybrids and selective breeding used	traditional seeds and breeding
4		agro-chemicals, pesticides, and fertilisers used	no pesticides, fertilisers or agro-chemicals
5		sophisticated heavy machinery used	traditional ploughing and cropping
6		environmental pollution is high	no environmental pollution

4. No. Small-scale farming may be highly profitable, producing a surplus that can be sold. Subsistence farming means farming only sufficient products for one's own needs with no surplus. OR:  
Yes. A small-scale farmer has insufficient land or capital to grow enough except for himself/herself and his/her family's needs.
5. Advantages: progressive/modern; productive; commercial; small enough to change according to market demands; small enough to change according to climate changes  
Disadvantages: struggle to access credit; co-operatives; time; women are the farmers and have a double burden of looking after the family and working on the farm
6. Advantages: it is easier to obtain credit as the farm can act as collateral; investment in expensive machinery is more easily obtainable; there is often an employment hierarchy on the farm from the owner, through the manager down to the labourers  
Disadvantages: profits can be lost if there is a drought or floods; it is an expensive undertaking; farm security is a problem
7. Any answer that is well-substantiated is acceptable.  
Yes: small-scale farmers are more important because they provide for the food security of many families.  
No: they are too small to produce large surpluses needed to sell or export; they do not employ people; they use few services.

**Activity 3** (Learner's Book, page 280)

1. yes
2. In the line graph of Figure 7.2.4, the blue export figure is above the line figure of the green import figure.  
It is good for the economy: it brings in money from other countries; it stimulates demand for more products; it creates jobs in our country.
3. Export income appears to be rising; imports are levelling off.
4. Zimbabwe, Angola, Mozambique
5. United Kingdom, Netherlands
6. The first European settlers to South Africa came from the Netherlands. They were followed by the British who took control from the Dutch.

**Activity 4** (Learner's Book, page 280)

1. maize, sugarcane, wine, citrus
2. wheat
3. A country that exports more than it imports has a surplus of food. This guarantees food security for the country. It supplies jobs. It brings money into the economy.
4. Rooibos tea and fynbos dried flowers are indigenous to South Africa.

**Activity 5** (Learner's Book, page 282)

The learners' reports should include these factors from the Learner's Book:

Positive factors that favour agriculture in South Africa		
	Physical factors	Examples
1	<b>Climate</b>	<ul style="list-style-type: none"> <li>• A Mediterranean climate exists in the Western Cape with hot, dry summers and cool rainy winters</li> <li>• A subtropical climate exists in the east and north-eastern interior, with hot and wet summers and cool, dry winters</li> <li>• The warm Mozambique Current influences temperatures and rainfall along the east coast: evaporation and precipitation are high</li> <li>• The dominant Indian Ocean high-pressure cell in summer controls the prevailing north-easterly winds that blow over the warm ocean and bring precipitation to the eastern half of the country</li> <li>• In winter, families of low-pressure cells move over the Western Cape Mountains, bringing winter cyclonic rainfall</li> <li>• Mountainous areas have temperate climates because of altitude</li> </ul>
2	<b>Soil</b>	<ul style="list-style-type: none"> <li>• The most fertile soil is found in the eastern region where the climate is hot and wet</li> <li>• The Karoo soils are fertile. Livestock thrive on the grasses and shrubs</li> </ul>
	Political factors	Examples
1	<b>Land ownership</b>	<ul style="list-style-type: none"> <li>• Since 1994, land redistribution and restitution have encouraged settlement claims to land</li> <li>• There is an open market for land, where fair and equitable prices for land operate</li> <li>• Government support in the form of agricultural extension officers and technical advisers for new farmers and small-scale commercial farms is a positive step</li> </ul>
2	<b>Trade</b>	<ul style="list-style-type: none"> <li>• Deep harbours and international airports encourage the export of agricultural products</li> <li>• Communication networks and refrigerated containers make it possible to maintain the quality of products for the local and export markets</li> <li>• Our fruit and flowers are ready for export when the Northern European market needs them most, because of the opposite seasons the north experiences. This gives our export a competitive advantage.</li> <li>• The Marketing of Agricultural Products Act of 1996 introduced import tariffs to protect domestic products</li> <li>• Deregulation of agriculture since 1994 has created a more competitive farming industry</li> </ul>

Negative factors that hinder agriculture in South Africa		
	Physical factors	Examples
1	<b>Climate</b>	<ul style="list-style-type: none"> <li>• The cold Benguela Current influences temperatures and rainfall along the west coast: there is little evaporation or precipitation</li> <li>• The dominant high-pressure cell over the interior in winter reduces the chances of precipitation in the interior</li> <li>• The dominant Atlantic Ocean high-pressure cell in summer controls the prevailing south-easterly winds that blow over the cold ocean and bring little or no precipitation to the western half of the country</li> <li>• Distance from the sea creates climatic extremes in the interior</li> <li>• Rainfall varies from 0 mm to 1 000 mm in the east of the country. Average rainfall is approximately 500 mm a year</li> </ul>
2	<b>Soil</b>	<ul style="list-style-type: none"> <li>• The traditional homelands have reduced soil fertility as a result of subsistence farming techniques</li> <li>• A limited and variable rainfall makes the Karoo a marginal agricultural area even though the soils are fertile</li> <li>• Soil erosion is a constant problem because it reduces soil fertility by washing away soil organic matter such as humus</li> </ul>
	Political factors	Examples
1	<b>Land ownership</b>	<ul style="list-style-type: none"> <li>• Prior to 1994, up to 87% of South African land was owned by whites; 13% was farmed by black owners</li> <li>• Previously disadvantaged people lack the communication and skills and capital required to purchase farms large enough to benefit from economies of scale in commercial farming</li> </ul>
2	<b>Trade</b>	<ul style="list-style-type: none"> <li>• Deregulation has removed subsidies for farming, which has made less successful farmers leave the sector</li> <li>• Foreign imports can flood the market with cheaper agricultural products</li> <li>• Small-scale farmers do not have access to specialist marketing support institutions</li> </ul>

**Activity 6** (Learner's Book, page 285)

1. Food security is the physical, social and economic access and availability at all times, by all people, to 'sufficient, safe and nutritious food to meet their dietary needs for an active and healthy life'.
2. Food insecurity can lead to social uprisings, riots and strikes. The effect of food insecurity on children leads to malnourishment, and chronic conditions such as kwashiorkor.
3. Physical, economic and social factors affect food security.
4. economic and social factors, and possibly physical factors through technology and more resistant seed varieties
5.
  - a. rural areas
  - b. it improved

c.

	<b>Province, 1999</b>	<b>Province, 2005</b>
1	Eastern Cape	Eastern Cape
2	Northern Cape	Northern Cape
3	North West	Limpopo
4	Limpopo	Free State
5	Mpumalanga	North West
6	KZN	Gauteng
7	Gauteng	Mpumalanga
8	Free State	KZN
9	Western Cape	Western Cape

- d. The Eastern Cape and Northern Cape are the most food insecure provinces; the Western Cape is the least affected. The Free State's position has worsened.
6. civil unrest, social unrest, poor health

**Activity 7** (Learner's Book, page 287)

1. There is a link between poverty and urban food insecurity.
2. Recommendations will differ from group to group. Write up answers on the board and find consensus for the most important priorities. Expect these on your list:

Access to a market to sell and buy; availability of land for agriculture in urban areas; community-up involvement; availability of larger-sized plots; encouragement of mixed cultivation; education in permaculture, intercropping, rain harvesting and the use of compost; access to the Department of Agriculture for assistance; better communication between residents and municipalities; encourage the unemployed to be involved in urban agriculture; encourage the youth in urban areas to participate; educate households on using social grants for sustainable agriculture.

## **Informal assessment**

### **Activity 1**

Go through the answers with the class. Ask pairs to offer answers.

### **Activity 2**

Have a class discussion. Work through the questions and answers together.

### **Activities 3 and 4**

Take feedback as a class. Ask learners to offer answers.

### **Activity 5**

Mark learners' reports and give them feedback about their progress.

### **Activity 6**

Have a class discussion. Work through the questions and answers together.

### **Activity 7**

Go through the answers with the class. Ask learners to offer answers.

## Remedial

Ask learners who had difficulty with this unit or specific sections to go through the unit/sections again and to define or explain the key concepts.

## Extension

Ask learners to research which regions in the world are most food insecure and to mark these on a world map in red; and to mark the regions which are most food secure in blue.

Learner's Book  
pages 288–294  
Duration: 5 hours

## UNIT 3

## Mining

TERM 3, WEEKS 3–4

### Curriculum and Assessment Policy Statement (CAPS) content

#### Mining

- Contribution of mining to the South African economy
- Significance of mining to the development of South Africa
- Factors that favour and hinder mining in South Africa
- A case study of one of South Africa's main minerals in relation to the above points

#### Resources

- Learner's Book pages 288–294
- Websites (optional):
  - [http://en.wikipedia.org/wiki/Mining\\_industry\\_of\\_South\\_Africa](http://en.wikipedia.org/wiki/Mining_industry_of_South_Africa)
  - <http://www.southafrica.info/business/economy/sectors/mining.htm#.UJvyXIf2-to>
  - <http://www.bullion.org.za/content/?pid=86>
- The school library may have magazines and newspaper articles about mining in South Africa; including the strike at the platinum mine at Marikana which made international news in 2012.

#### Preparation

- Read through and familiarise yourself with the content.
- Locate the following places on the map of South Africa:
  - the Bushveld Igneous Complex
  - the Marikana Mine near Rustenburg in North West province
  - where gold was found on the Witwatersrand
  - where diamonds were mined in Kimberley.

### Teaching the unit



#### Lesson 1

- Go through the section, 'How does mining contribute to the South African economy?' (page 288) with learners.
- Explain that mining of minerals and gold gives South Africa strategic importance in the world. Large powers such as the USA, India and China, maintain good diplomatic and economic relations with us because of the global demand for gold and other minerals.

- The amount of gold and platinum produced affects the international price of these commodities. In the business news on TV, and in the business sections of the newspapers, there is always information about mining, the price of minerals, the significance of strike action by miners, and the export of ore. Learners should try to keep up to date with this, particularly while you study this area.

#### Activity 1

- This is an individual activity. Take feedback from learners once they have completed the activity.
- List the factors learners call out on the board.
- Go through the section, 'What is the significance of mining to the development of South Africa?' (pages 289–290) with learners.
- Ask learners to locate on a map of South Africa where diamonds were mined in Kimberley, where gold was found on the Witwatersrand, the Bushveld Igneous Complex, Richards Bay, and any other places mentioned.

#### Activity 2

You can use this activity for class discussion. Work through the questions as a class and ask learners to provide answers.



### Lesson 2

Work through the section, 'Which factors favour and which hinder mining in South Africa?' (pages 291–292) with learners.

#### Activity 3

- Draw a table on the board with the headings: Factors which favour mining; Factors which hinder mining. Ask learners to help you populate the table.
- Have a class discussion about the problems that could inconvenience miners and be a danger to them.
- Ask learners to locate Marikana Mine on a map of South Africa.
- Ask them what they know about the issues and problems that occurred at Marikana Mine in 2012 in South Africa. Allow learners to express what they understand about the issues.
- Go through the section, 'What practical knowledge can we gain from case studies about mining in South Africa?' (pages 293–294) with learners.

#### Activity 4

Learners can work on their own to answer the questions. Facilitate the activity by helping those learners who need help.

### Answers

#### Activity 1 (Learner's Book, page 288)

1. a. Mining contributes 8,6% directly to the GDP of South Africa; mining exports are responsible for 60% of South Africa's exports; mining earns approximately 50% of South Africa's foreign exchange; mining contributes 13,2% of the total tax received from businesses by government; mining contributes R78 billion to wages and salaries; it uses 15% of South Africa's electricity supply; it directly contributes to

the employment of approximately 50 000 people; mining attracts 12% of the total foreign investment in South Africa; it spent R409 billion in South Africa on purchases and operating costs; it directly contributes 50% of the volume of traffic through Transnet's ports and railways.

- b. Mining contributes to: the development of the country's infrastructure; the development of engineering in reaction to specific needs in mining; the development of financial services to satisfy the investment needs of the mining industry.
2. The multiplier effect is the amount by which a change in one variable has a larger effect on other variables. For example, wages to miners puts money in their pockets; with money, goods and services are bought; this creates a demand for more goods and services and gives employment to more people; who can earn money, buy goods and services, create a further demand for goods and services, so more people need to be employed; and so on.

**Activity 2** (Learner's Book, page 290)

1. Mining created a demand for iron, steel and electricity, as well as a demand for a transport infrastructure such as roads and railway. Shoes and boots were essential to protect miners from the hot and wet conditions underground. This demand led to the development of these industries (shoe industry) in South Africa. Mining provides raw materials to many industries, e.g. gold, chemical materials.
2. It is where strategic minerals are found in plentiful supply relatively close to the surface, e.g. gold, platinum, chrome and manganese ore, zirconium, vanadium and titanium.
3. Strategic minerals are essential to the production of sophisticated weapons and technical equipment.

**Activity 3** (Learner's Book, page 292)

1. a. Physical, economic and social factors favour mining: rich mineral resources; fossil fuels; abundant water; natural harbours; abundant labour; low extraction costs; high profit margins; cheap distribution costs; skilled immigrants; migrant workers.  
b. Physical, economic and social factors hinder mining: the cost of deep mining; long distribution distances; hot and dry environment; absence of amenities for workers; absence of water; work stoppages; commodity prices; input costs; fuel prices; poor safety record; poor management; small skills base; labour relations problems.
2. Poor management problems can lead to labour unrest and a lack of safety in the mines. This can create tensions. Poor management can expose miners to disasters underground. Poor housing and remuneration can contribute to unrest.

**Activity 4** (Learner's Book, page 294)

1. South Africa has 95% of the world reserves of platinum; which is a strategic mineral, non-corrosive, non-magnetic; and used in the aerospace and defence industries, catalytic convertors, spark plugs, electrodes, oxygen sensors, and chemotherapy for cancer victims.
2. The sale of platinum brings money to South Africa. Foreign investment in the mines creates employment opportunities.
3. the low wages; the high monetary value for platinum; adequate water supplies; fairly short distribution route; strategic value of the mineral; easy accessibility in the Bushveld Igneous Complex

4. poor industrial relations; stoppages; price fluctuations on the international markets; fluctuations in the price of fuel; unskilled labour
5. Points for 'reasons for the strike' include: poor industrial relations; low wages; poor management.  
Points for 'results of the strike' include: a 27% drop in the value of the company's shares; the need to borrow up to US\$1,25 billion for restructuring and investment in infrastructure and human resources; the deaths of 44 people; a loss of 2 500 ounces of production each day of the strike; a daily loss of US\$3,9 million; costly legal cases; uncertainty about investment in South Africa; immediate rise in the price of platinum.

### Informal assessment

#### Activity 1

Take feedback from learners once they have completed the activity. List the factors learners call out on the board.

#### Activity 2

Work through the questions as a class and ask learners to provide answers.

#### Activity 3

Work as a class on the answers.

#### Activity 4

Go through the answers with the class. Encourage learners to offer answers.

### Remedial

Ask learners who had difficulty with this unit to go through the unit again and then to explain the strategic importance of the mining of minerals and gold for South Africa.

### Extension

Ask learners to find the most current information about the mining sector in South Africa that they can. (They can watch the business news on TV, and/or read the business sections of the newspapers). They should note down information about the price of minerals, the significance of any strike action by miners, and the export of ore. Ask them to report back what they find out to the class.

Learner's Book  
pages 295–306  
Duration: 6 hours

## UNIT 4

## The secondary and tertiary sectors

TERM 3, WEEKS 4–5

### Curriculum and Assessment Policy Statement (CAPS) content

#### Secondary and tertiary sectors

- Contribution of secondary and tertiary sectors to the South African economy
- Types of industries, such as heavy, light, raw material orientated, market orientated, footloose industries, ubiquitous industries and bridge (break-of-bulk point) industries
- Factors influencing industrial development in South Africa, such as raw materials, labour supply, transport infrastructure, political intervention, competition and trade



- South Africa's industrial regions:
  - (PWV)-Gauteng, Durban-Pinetown, Port Elizabeth-Uitenhage, South Western Cape Metropole
  - Factors influencing their location
  - Main industrial activities
- Case studies from South Africa to illustrate the above

## Resources

- Learner's Book pages 295–304
- Websites (optional):
  - <http://www.mediaclubsouthafrica.com/index.php?...sectors>
  - <http://www.nationsencyclopedia.com/Africa/South Africa>
  - <http://www.hsrc.ac.za/Document-2459.phtml>
  - <http://en.wikipedia.org/wiki/Industry>  
Automotive in South Africa - Key information on the South African...  
[www.mbendi.com](http://www.mbendi.com) › The World › Africa › South Africa
  - <http://www.southafrica.info/business/economy/sectors/manufacturing.htm#.UK-N34f2-to>
- The school library may have magazines and newspaper articles about industry and services in South Africa. Tourism is a growth service industry.
- The TV and the business sections of newspapers should offer information about industries and services in South Africa.
- Wall map of South Africa and/or class atlases

## Preparation

- Read through and familiarise yourself with the content.
- Locate the four industrial regions on the South Africa map: Durban-Pinetown, Port Elizabeth-Uitenhage, South Western Cape Metropole, (PWV)-Gauteng.
- Read up on Coega in the Eastern Cape and locate its position with regard to the Port Elizabeth-Uitenhage industrial region.

## Teaching the unit



### Lesson 1

- Explain to learners that there is a large section of work in this unit, but the terms and concepts should be familiar to them as it repeats work done in EMS and in Social Science in Grade 9.
- Go through the section, 'How do the secondary and tertiary sectors contribute to the South African economy?' (pages 295–297) with learners.
- Use the wall map and/or atlases to show where the major secondary and tertiary sector industries and services are located (see Tables 7.4.1 and 7.4.2 on pages 296 and 297 for examples). Also ask learners for their own examples.
- Factors which favour the development of the secondary and tertiary sectors have to do with infrastructure and human resources, such as transport, education, skills, capital, raw materials and labour. Ask the learners where they would expect to find these factors grouped together (Answer: In the main urban areas).
- Show them on a map where the four industrial regions are located. Explain that they are also the areas of greatest population density.

### Activity 1

- This activity can be done as a class discussion to ensure that all learners gain the basic concepts that underpin the rest of the unit.
- Go through the section, 'What types of industries are there?' (pages 297–298) with learners.
- Using Table 7.4.2 (page 297), explain that industries can be classified according to their volume (light/heavy), location (raw material orientated; market orientated; footloose; ubiquitous), and function (bridge or break-of-bulk). Ensure that learners understand the terminology.

### Activity 2

- Learners work on their own to answer the questions.
- Take feedback as a class and ask learners to check and correct their answers where necessary.



## Lesson 2

- Ask learners to suggest factors which influence industrial development.
- Explain (if necessary) that for industrial development a country needs raw materials and a labour supply; it also requires infrastructure such as transport; it needs political intervention to encourage and support industrial entrepreneurship; incentives and competition in order to stimulate companies to be more productive, more competitive, and more flexible to react to the market demands.
- Read through the section, 'Which factors influence industrial development in South Africa?' (pages 299–301) with learners.

### Activity 3

- Ask learners to read through the section again by themselves.
- They should then answer the questions in the activity.
- Go through the section, 'Where are South Africa's industrial regions located?' (pages 301–302) with learners.
- Go through Table 7.4.4 (page 302) which describes the factors that influence each region's location and their main industrial activities.

### Activity 4

- Learners do this activity on their own or in pairs.
- Ask learners to locate the position of Coega in the Eastern Cape on a map and to see how far it is from the Port Elizabeth-Uitenhage industrial region.
- They should then read the case study, 'The car industry in Port Elizabeth and Uitenhage' (page 303). This case study shows how a municipality attracted large motor vehicle companies with attractive rates and incentives. It also shows how big industries act as a magnet for allied, component industries.

### Activity 5

In this activity, learners describe the direct and indirect contribution car manufacturers have made to the South African economy.

### Activities 6–8

Learners do these activities on their own or in pairs.

## Answers

### Activity 1 (Learner's Book, page 297)

- 40%
  - 60%
- The secondary sector is the sector involved in manufacturing and industry.
  - The tertiary sector is the sector involved in the buying and selling of goods and services such as tourism, banking and education.
- The secondary and tertiary sectors used the platform of agriculture and mining to develop. Agriculture provided surplus food that could be converted into different products, such as wheat into bread, pasta, and breakfast cereals, or grapes into dried fruit, table grapes, wine, grape-juice, and tartar. Mining created demands for electricity, iron and steel, and transport, as well as for skilled labour, clothing and boots, housing, and the services that surround and support a population.
- Industries enable a country to be self-supporting; the country does not have to import goods as it is able to make what it needs; the country can export surplus products, which will bring in foreign currency.
- The size of the tertiary sector is an indication of the level of economic development of a country. The tertiary sector provides employment opportunities; and a range of sophisticated services. This shows a degree of skilled labour.

### Activity 2 (Learner's Book, page 298)

- function, location and volume
- Light industries are less capital intensive, have less impact on the environment, are found close to residential areas as they do not need zoning regulations, and are associated with consumer goods. Heavy industries are capital intensive, have a large impact on the environment, and are generally heavy and bulky, e.g. thermal power, refineries, the chemicals industry.
- footloose or ubiquitous industries
- Labour will always move to where the jobs are.

### Activity 3 (Learner's Book, page 301)

- raw materials
- Competition should stimulate companies to be more productive, more competitive, and more flexible to react to the market demands. This benefits the consumer, and creates job opportunities.
- The common purpose is to promote domestic and foreign private investment in those areas previously disadvantaged where there is potential for economic growth; and the promotion of trade and industry to create job opportunities; and to promote underdeveloped areas.
- A transport infrastructure is needed for the movement of raw materials to industrial sites where they can be changed in form, processed, packaged and distributed to local and domestic markets. A sophisticated transport system carries people and products in safety in a number of ways: air, road, rail and sea.

### Activity 4 (Learner's Book, page 302)

- (PWV)-Gauteng (PWV-Pretoria-Witwatersrand-Vereeniging); Durban-Pinetown; South Western Cape Metropole; Port Elizabeth-Uitenhage (Coega zone; Nelson Mandela Metropole)

2. raw materials; labour supply; adequate water supply; adequate power supply; transport facilities; markets; labour
3.
  - a. iron and steel
  - b. petrol refineries
4. South Western Cape Metropole
5. a short distribution distance to neighbouring states by road and rail; through Maputo harbour, access to international trade

**Activity 5** (Learner's Book, page 304)

1. General Motors, Volkswagen, Ford Motor Company
2. GM needed spray paint, shatter-proof glass, tyres, brakes, wiring, electronics. Cluster industries developed.
3.
  - a. employment; sales; self-reliance on domestic products
  - b. forward and backward integration with component automotive industries; export of parts; employment opportunities, for customs officials for example; foreign currency earned for the country

**Activity 6** (Learner's Book, page 304)

1. Durban and Richards Bay.
2. Transport infrastructure.
3. Employment/export/allied industrial processes and products.
4. It is corrosion proof and light.
5. Almost 100% of the aluminium can be recovered from recycling processes, which are more cost and energy efficient than making primary aluminium products.

**Activity 7** (Learner's Book, page 305)

1. Fertile valley; seasonal variations are extreme; adequate winter rainfall and hot dry summers; close to raw materials (orchards).
2. It does not affect colouring; it is aseptic so there is no contamination of the product; it does not affect the taste of the product; it guarantees freshness; it can be packaged in 'bricks' allowing for more units per cargo space.
3. Our seasons are the opposite of the northern hemisphere, allowing our fresh products to be exported when there are none available in the northern hemisphere.
4. Employment opportunities; revenue from sales; advertising.
5. Markets imply more business through sales, and more money; exports bring in foreign currency to the country; exports create more jobs; exports advertise awareness of your product globally; exports help a firm to expand; good economical and political ties; globalisation.
6. There is fruit-picking; sorting of fruit; manufacturing into juice; packaging; tours of the company's operations.

**Activity 8** (Learner's Book, page 306)

1. It is the smallest province but it has the largest population; it is the most densely populated, and the wealthiest, province in South Africa.
2. There was a demand for steel and iron from mining, construction and transport.
3. Directly: There is a wide variety of skilled labour and unskilled labour available. Indirectly: There is a demand for products.
4. There is water available from the Vaal River; there are coal deposits; iron ore is found close by; there is plenty of flat land; north-east winds blow away the pollution; there is a huge demand from other industries for iron and steel products.

5. Decentralisation means moving outwards to the periphery, from the core. Gauteng is overpopulated. Creating employment opportunities elsewhere helps to spread development and wealth in the country.
6. It is fifth.
7. The construction industry
8. Richards Bay; Durban; Maputo; East London.

### Informal assessment

#### Activities 1, 3–8

Go through the answers with the class. Ask learners to offer answers.

#### Activity 2

Take feedback as a class and ask learners to check and correct their answers where necessary.

#### Remedial

- Ask those learners who struggled with this unit or a section of it, to re-read the unit. As they read, they should make notes in answer to these questions:
  - How do the secondary and tertiary sectors contribute to the South African economy?
  - What types of industries are there?
  - Which factors influence industrial development in South Africa?
  - Where are South Africa's industrial regions located?
  - What practical knowledge can we gain from case studies about the secondary and tertiary sectors in South Africa?
- Take in learners' work and give them feedback on the progress they have made.

#### Extension

Ask learners to find the most current information about the secondary and tertiary sectors in South Africa that they can. (They can watch the business news on TV, and/or read the business sections of the newspapers; and/or visit the websites listed on page 123.) Ask them to report back what they find out to the class.

Learner's Book  
pages 307–311  
Duration: 3 hours

## UNIT 5

## Strategies for industrial development

TERM 3, WEEKS 5–6

### Curriculum and Assessment Policy Statement (CAPS) content

#### Strategies for industrial development

- Overview of apartheid and post-apartheid industrial development strategies
- Concept and distribution of Industrial Development Zones (IDZs)
- Case studies of two Spatial Development Initiatives (SDIs)
- Issues associated with industrial centralisation and decentralisation

#### Resources

- Learner's Book pages 307–311
- Websites (optional):
  - <http://idc.co.za>
  - <http://www.mcli.co.za/mcli-web/mdc/sdi.htm>

- The school library may have magazines and newspaper articles about strategies for industrial development.
- Wall map of South Africa and/or class atlases
- Past national Geography examination papers

### Preparation

Read through and familiarise yourself with the content.

## Teaching the unit



### Lesson 1

- Ask learners why they think the extent of industrial development in a country is an indicator of its level of economic development. Allow them time to express their opinions and thoughts.
- Read through the section, ‘What industrial development strategies were used during and after apartheid?’ (pages 307–308) with learners. This section focuses on the history of industrial development strategies which the apartheid and post-apartheid governments implemented.

#### Activity 1

- Encourage learners to re-read the section, ‘What industrial development strategies were used during and after apartheid?’ (pages 307–308).
- They then work on their own to answer the questions.
- Ask learners if they know what Industrial Development Zones (IDZs) are. Do they know where they are located in South Africa?
- Read through the section, ‘What are Industrial Development Zones (IDZs), and where are they?’ (pages 308–309) with learners.
- Explain that IDZs are areas identified by government for stimulating economic growth through investment in industries.
- There are four IDZs, located near Port Elizabeth (Coega IDZ), East London (ELIDZ), Richards Bay (RBIDZ), and Gauteng (OR Tambo International Airport).
- Locate the IDZs on a wall map or in the atlases. Show how these areas overlap with transport routes and ask learners why they think this is so.

#### Activity 2

You can use these questions for a class discussion if there is time, or learners can complete them for homework.



### Lesson 2

- Discuss the apartheid era of homelands pre-1994, and show how the SDIs and IDZs are in areas that were previously disadvantaged.
- Locate the SDI areas on a wall map or in the atlases. Show how these areas overlap with transport routes and ask learners why they think this is so.
- Read through the section, ‘What can we learn from the case studies of two Spatial Development Initiatives (SDIs)?’ and the two case studies (pages 309–310) with learners.

### Activity 3

- Ask learners to read through the two case studies by themselves again (pages 309–310), using the questions in Activity 3 to direct their reading.
- As they read, they should try to find the answers to the questions.
- Read through the section, ‘What issues are associated with industrial centralisation and decentralisation?’ (pages 310–311) with learners.
- Discuss the issues and challenges associated with centralisation and decentralisation.

### Activity 4

Learners work on their own to answer the questions.

## Answers

### Activity 1 (Learner’s Book, page 308)

1. a. 1940, the Industrial Development Corporation (IOC); 1958 the Viljoen Commission; The Kleu Commission of 1983  
b. 1994, the Spatial Development Initiatives; Growth, Employment and Redistribution (GEAR) strategy; the Reconstruction and Development Programme (RDP); the Industrial Development Zones (IDZs); and the Accelerated and Shared Growth Initiative for South Africa (AsgiSA)
2. Pre-1994 the economic strategies were contained in the outcomes of various commissions and developments: 1940 the IDC (Industrial Development Corporation) was a strategy to promote economic growth through developing a broad-based industrial sector. Financial support was provided for start-up industries and partnerships between private and public sectors for large industrial needs was encouraged/ The outcomes of the Viljoen Commission, 1958 created a strategy to encourage and protect domestic industrial growth by placing import tariffs on goods being imported/ The outcomes of the Kleu Commission developed a strategy of trade liberalisation to encourage greater trade competition. Post-1994 strategies focus on international markets and greater competitiveness; regional cooperation within southern Africa; and transformation of ownership.
3. South Africa after 1994 was welcomed by the world; no trade embargoes existed against South Africa after 1994; there was equality in terms of employment opportunities, skills, and ownership.

### Activity 2 (Learner’s Book, page 309)

1. Industrial Development Zone
2. These are located near Port Elizabeth (Coega IDZ); East London (ELIDZ); Richards Bay (RBIDZ); and Gauteng (OR Tambo International Airport). These are formerly disadvantaged areas that need economic stimulus.
3. creating an industrial complex that has strategic economic advantages; identifying a geographic location with strategic possibilities; facilitating the use of raw materials and resources for industry; enhancing existing industries; creating sustainable employment opportunities for the community; making South Africa globally competitive in export markets
4. a deep sea port; railway links to the interior; a large labour pool; good infrastructure; favourable rates

### Activity 3 (Learner's Book, page 310)

- Mozambique Corridor; Beira Development Corridor; Walvis Bay Development Corridor
  - Richards Bay-Empangeni SDI; Fish River SDI; Wild Coast SDI
- It is development over a geographical space or area recognised by government as being in need of economic stimulus and support.
- Similarities: poor; high unemployment; potential for development exists; tourist potential  
Differences: the Wild Coast is a tourist area with agriculture; the Maputo Corridor has engineering, manufacturing and transport infrastructure

### Activity 4 (Learner's Book, page 311)

- Centralisation is the grouping of similar industries in a few main centres.
  - Decentralisation is the spatial distribution of industries across a country.
- Advantages of centralisation: costs are lowest for production; plentiful skilled labour; access to raw materials; access to transport; established services; economies of scale  
Disadvantages of centralisation: too much pressure on local services; lack of housing; social unrest because of poor service delivery; pollution of the environment and atmosphere; limited space for expansion
- Government needs to: create growth nodes through decentralisation policies; create job opportunities in economically disadvantaged areas; lessen the stress on overpopulated areas.
- In the economically underdeveloped areas that were former homeland areas, e.g. Eastern Cape

## Informal assessment

### Activities 1–4

Go through the answers with the class. Ask learners to mark their own answers or to swap books and mark each other's answers.

### Remedial

- Create a worksheet with a table of key concepts and terms in Column 1 and the jumbled definitions in Column 2. Ask learners to match the key concept with the correct definition. This helps to test their understanding of terms.
- Ask those learners who struggled with this unit or a section of it, to re-read the unit. As they read, they should make notes in answer to these questions:  
What industrial development strategies were used during and after apartheid?; What are Industrial Development Zones (IDZs), and where are they?; What can we learn from the case studies of two Spatial Development Initiatives (SDIs)?; What issues are associated with industrial centralisation and decentralisation?
- Take in learners' work and give them feedback on the progress they have made.

### Extension

- Ask learners to find out more about IDZs and SDIs and to share what they learn with the class.
- Refer learners to past national Geography examination papers for more questions on strategies for industrial development.



### Curriculum and Assessment Policy Statement (CAPS) content

- Concept and characteristics of informal sector employment
- Reasons for high informal sector employment in South Africa
- Challenges facing South Africa's informal sector
- Case studies to illustrate the above in the South African context

### Resources

- Learner's Book pages 312–317
- Websites (optional):
  - [http://en.wikipedia.org/wiki/Informal\\_sector](http://en.wikipedia.org/wiki/Informal_sector)
  - [http://wiego.org/sites/wiego.org/files/publications/files/Wills\\_WIEGO\\_WP6.pdf](http://wiego.org/sites/wiego.org/files/publications/files/Wills_WIEGO_WP6.pdf)
  - <http://www.mindset.co.za/resources//0000022163/0000029281/0000029221/default.htm>
- Look for extra reading and interesting articles about the informal sector in South Africa in magazines and newspaper articles.
- Past national Geography examination papers

### Preparation

- Read through and familiarise yourself with the content.

### Teaching the unit



#### Lesson 1

- Ask learners what they understand by the term, 'informal sector?' (Most of us have some experience of the informal sector: whether it is buying something on the side of the road, or from a vendor or hawker at a railway station or taxi rank, or employing a domestic worker in our home. The concept is one that learners will identify with easily.)
- As a class, brainstorm on a mind map (on the board), as many examples of the informal sector that learners can think of.
- Go through the section, 'What is the informal employment sector?' (pages 312–313) with learners.
- Discuss the advantages and disadvantages of the informal sector.

#### Activity 1

- This activity focuses on the concept and characteristics of informal sector employment.
- Ask learners to complete the activity on their own.
  
- Ask: Why do you think the informal sector is a big growth area in South Africa and globally?
- Allow learners time to discuss and express their opinions and thoughts about this.
- Then read through the section, 'Why is there a high informal employment sector in South Africa?' (pages 314–315) with learners.

### Activity 2

- This activity focuses on reasons for high informal sector employment in South Africa.
- Let learners work in pairs to read the case study, 'The growth of minibus taxi services in South Africa' (page 315–316).
- They can then complete Activity 2. Once everyone has completed this activity, go through the answers with the class.



## Lesson 2

- As a class, brainstorm all the challenges that learners can think of that affect people in the informal employment sector.
- Write up their ideas on the board – use a mind map if you want to.
- Read through the section, 'What challenges face South Africa's informal employment sector?' (pages 316–317) with learners.

### Activity 3

Use the questions in the activity to have a class discussion on challenges facing South Africa's informal sector.

## Answers

### Activity 1 (Learner's Book, page 313)

1. black economy or shadow economy
2. The formal sector has registration of companies and employees; legal status; tax and PAYE; can sue or be sued; can get bank loans.  
The informal sector has no registration; has no legal status; does not pay any tax; cannot be sued; offers no employee benefits; cannot get bank loans.
3. no legal safety; no employee safety; can be fired from a job without any unemployment benefits; low paid jobs in bad conditions
- 4.

	Advantages of informal sector	Disadvantages of informal sector
1	no rental costs	no employee benefits
2	no skills necessary	no safety controls
3	offers a wide range of services	no tax comes back into the country

5. a. and b. Similarity is that the informal sector provides employment opportunities for people who otherwise might not have work.  
Dissimilarity is that in the USA, they lose less tax as only a small percentage (8,8%) are employed in the informal sector, while in Zimbabwe 59,9% are employed in the informal sector, and the government loses out on the potential tax from these people.

### Activity 2 (Learner's Book, page 316)

1. The economic crisis caused businesses to outsource their work to lower-priced, competitive workers in the informal sector.
2. apartheid policies
3. All restrictive laws were scrapped after 1994. Freedom of movement, equality before the law, transformation policies in the work place and job creation all created a more liberal approach for the informal sector.
4. Points to include: efficient transport; stops on demand; cuts down on walking time for passenger; share fares to reduce transport costs; cars are too expensive to own; no registration; no tax; no labour laws; plentiful supply of labour

5. It accounts for 65% of all transport in SA; provides jobs; efficient transport for businesses.
6. Competitive tensions are caused by cost-cutting services.
7. government recognition and regulation

**Activity 3** (Learner's Book, page 316)

1. social, economic and political
2. Workers have no employee benefits; this can keep people trapped in low-paying jobs with no hope of improving their economic position.
3. It is difficult to raise bank loans when a business is not registered. This means that expansion is often impossible in this sector.
4. Banks could accept the nature of informal businesses and be more amenable and accessible to providing banking services to entrepreneurs.

## Informal assessment

### Activity 1

- Go through the answers with the class. Encourage learners to offer answers.
- Observe the learners as they complete the activity and participate in the report back.

### Activity 2

Once everyone has completed this activity, go through the answers with the class.

### Activity 3

- Observe learners as they participate in the class discussion.
- Encourage all learners to offer some ideas and opinions, and to provide reasons for their opinions.

## Remedial

- Ask those learners who struggled with the unit or a part of it, to re-read the unit. As they read, they should make notes to answer these questions:
  - What are the characteristics of the informal sector?
  - What is the importance of the informal sector?
  - Why has the informal sector developed to such a large extent?
  - What problems or challenges face the informal sector?
  - What measures can be taken to remedy these problems/challenges?
- Take in learners' work and give them feedback on the progress they have made.

## Extension

- Encourage all learners to answer questions on the informal sector in past national Geography papers.
- Learners can interview a hawker to get a first-hand perspective of the advantages and disadvantages of working in the informal sector in South Africa.

	<b>MODULE 8</b>	
<b>TERM 3</b> Learner's Book pages 318–336 Duration: 7 hours Lessons: 14 half-hour lessons or 7 hour long lessons	<b>ECONOMIC GEOGRAPHY OF SOUTH AFRICA: GEOGRAPHICAL SKILLS AND TECHNIQUES</b>	

This module focuses on using maps and photos to analyse and interpret aspects of economic development, from a spatial point of view.

### **Curriculum and Assessment Policy Statement (CAPS) content**

#### **Mapwork skills**

- Consolidation of map skills from Grades 10, 11 and 12
- Map and photo interpretation – includes reading and analysis of physical and constructed features
- Applying map-reading skills to maps and photos

#### **Topographic maps**

- Applying map skills and techniques: scale, contours and cross-sections
- Grid referencing

#### **Geographical Information Systems (GISs)**

- Examination of a selection of satellite images
- GIS concepts: remote-sensing and resolution
- Spatial and attribute data; vector and raster data
- Data standardisation, data sharing and data security
- Data manipulation: data integration, buffering, querying and statistical analysis
- Developing a 'paper GIS' from existing maps, photos or other records on tracing paper

#### **Using atlases (revision)**

- Examining thematic maps
- Comparing information from different maps

#### **Key geographical skills and techniques**

- map and photograph interpretation, including reading and analysis of physical and constructed features
- applying map-reading skills to maps and photographs
- applying map skills and techniques
- examination of selected satellite images
- GIS concepts: remote sensing and resolution
- spatial and attribute data; vector and raster data
- data standardisation, data sharing and data security
- data manipulation: data integration, buffering, querying and statistical analysis
- developing a paper GIS from existing maps, photographs or other records on tracing paper
- atlases; examining thematic maps
- atlases; comparing information from different maps

## Key words/concepts

spatial resolution; spectral resolution; temporal resolution; radiometric resolution; vertex

Learner's Book  
pages 319–322  
Duration: 2 hours

## UNIT 1

Mapwork skills

TERM 3, WEEK 7

### Curriculum and Assessment Policy (CAPS) content

#### Mapwork skills

- Consolidation of map skills from Grades 10, 11 and 12
- Map and photo interpretation – includes reading and analysis of physical and constructed features
- Applying map-reading skills to maps and photos

#### Resources

- Learner's Book pages 319–322
- Websites (optional):
  - For information on topographic maps: [http://en.wikipedia.org/wiki/Topographic\\_map](http://en.wikipedia.org/wiki/Topographic_map)
  - <http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)
- Any reports from mining houses, agricultural institutions or manufacturing industries which might contain maps or interesting photos (geographical aids) which are associated with economic geography

#### Preparation

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to the previous module on economic geography, as this skills development module requires a theoretical background in economic geography.
- Refer back to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this module builds.

### Teaching the unit



#### Lesson 1

- Introduce the lesson by reminding learners that mapwork and photo interpretation skills are not limited to physical geography.
- Also stress that geography is an integrated subject, but for convenience sake it is divided into sections, such as climatology, geomorphology, economic geography, and settlement geography.
- This lesson concentrates on extracting information from photographic sources and makes deductions based on information from the photos.
- Tell learners that photo interpretation will be linked to map interpretation as well; the two complement one another.
- The lesson relies heavily on a hands-on approach, in terms of the activity.

#### Activity 1

- The activity is photo-and map-based.
- Learners must be prepared to integrate aspects of photo interpretation and map reading.

- Economic geography theory is also integrated into question 3.
- Extend Activity 1 across both Lessons 1 and 2.

## » Lesson 2

- This is a continuation of the above, where the whole lesson can be used to review Activity 1 and to provide feedback in terms of going through the answers to Activity 1.
- Don't limit the discussion to the formal questions and answers in the Learner's Book and Teacher's Guide. You can add your own questions. For example, on the panorama of Paarl, refer learners to Grade 11, and to geomorphology in relation to weathering and erosion, and the formation of a granite landscape.
- There is also extra information to be read from the photos of Malmesbury (look at the way the wheat stalks are baled; is there a reason for this?)

### Answers

#### Activity 1 (Learner's Book, page 319)

1. A = mining; B = manufacturing; C = agriculture; D = manufacturing; E = agriculture; F = mining
2. A: An agricultural area/a field crop (wheat). B: Bokomo makes breakfast cereals, flour and other wheat products. So Malmesbury is an agricultural and grain processing centre. It is a developing/up-and-coming area.
3.
  - a. areas of intensive agriculture are indicated on the map/farm names.  
Proof: many farms; dams – irrigation
  - b. Higher. This is sought-after land for vineyards, in a picturesque, established environment.
  - c. Extreme south, roughly to west of R45 looking over vineyards towards Paarl Rock.
  - d. saddles or necks in mountains
  - e. Point out to learners the neck (saddle) immediately between Paarl Rock and Gordon's Rock.
  - f. slope too steep; shallow soil (granites)
  - g. vineyards (grapes)
  - h. fruit packing, wine making, dried fruit industry, distilling (KWV), associated food processing (jams, chutney)
  - i. The long hilly ridge (Paarl Mountain) to the west of the town, and the Berg River to the east, constrained the initial development of Paarl to a long, narrow town.

### Informal assessment

#### Activity 1

Learners cross-check answers with a partner. Answers must be provided after learners have had a chance to discuss their suggested answers.

#### Remedial

Review answers with the whole class, and be alert for problem areas in terms of skills which may be lacking, or interpretation of photos and maps which may be incorrect. Remedy by returning to relevant sections of the lesson.

#### Extension

Base a few of your own questions on the maps and photos in the Learner's Book, or on other map and photo resources which your school may have. This will reinforce this section of the work.

## Curriculum and Assessment Policy (CAPS) content

### Topographic maps

- Applying map skills and techniques: scale, contours and cross-sections
- Grid referencing

### Resources

- Learner's Book pages 323–326
- Websites (optional):
  - For information on topographic maps: [http://en.wikipedia.org/wiki/Topographic\\_map](http://en.wikipedia.org/wiki/Topographic_map)
  - <http://www.physicalgeography.net/fundamentals/contents.html> (highly recommended)

### Preparation

- Read through the unit to familiarise yourself with the content.
- Because the work relates to topographic maps, familiarise yourself again with the basics of what a topographic map is, and how it is not confined to the physical landscape.
- The emphasis here is on topographic maps and aspects of economic geography.

## Teaching the unit



### Lesson 1

- Introduce the concept of grid referencing, possibly by drawing a simple grid matrix on the board, such as the one below:

A	B	C	D
1			
2			
3			
4			
5			

- Note that latitude and longitude are commonly used to reference a point.
- Points on a map are commonly said to have coordinates.
- Ask learners what the standard is for coordinates (degrees, minutes, seconds).
- Use a map example to plot coordinates of a given place or, the other way around: given the coordinates, what feature occurs at that point?
- Work through pages 323–324 of the Learner's Book with learners.

### Activity 1

- This involves working with grid referencing.
- Coordinates are given and places or features must be identified.
- The opposite can also be asked – ask learners to give grid references or coordinates for given features.

## Lesson 2

- Continue with topographic maps.
- Scale, contours and cross-sections (all of which have been previously dealt with) are re-introduced. Read through page 325 with learners.
- Remind learners that these are not new concepts, but rather new applications in the context of human (economic) geography.

### Activity 2

- Learners use a map to construct two cross-sections in order to answer the question: Which cross-section shows the greatest variation in relief?
- They calculate the vertical exaggeration of the cross-section.

### Activity 3

Learners work with a grid and topographical sheet to find certain (built) features.

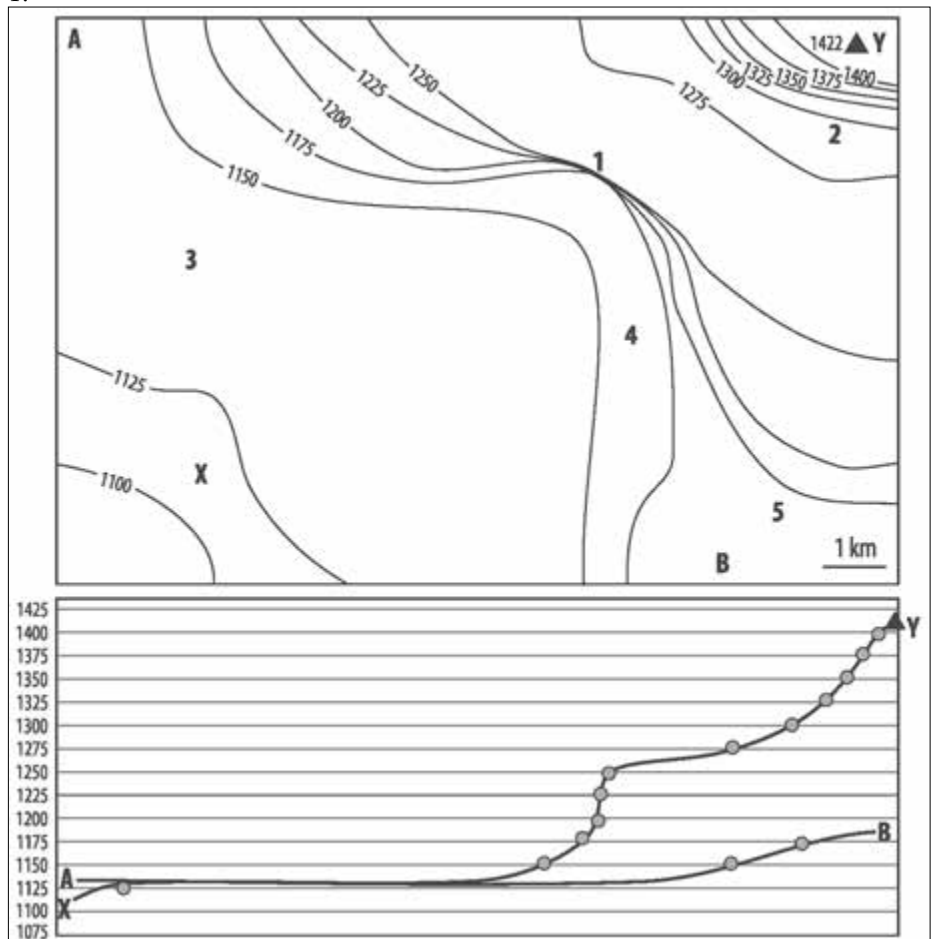
## Answers

### Activity 1 (Learner's Book, page 324)

	Unsuitable at:
1: extreme sport	airport /small urban settlement
2: ski resort	agriculture
3: airport	ski resort
4: small urban settlement	extreme sport
5: agriculture	small urban settlement /airport

### Activity 2 (Learner's Book, page 325)

1.





2. X – Y
3. Looking at the cross-section frame in no. 1 of this activity:
  - 0,8 cm represents 1 km
  - 8 cm represents 10 km or 1 000 000 cm

**Activity 3** (Learner’s Book, page 325)

1. stadiums
2. Vroue Monument

**Informal assessment**

**Activity 1**

Check that learners have correctly identified built features from the given two sets of coordinates provided. Possibly ask in what way a rugby or cricket stadium can be regarded as an economic aspect of the built environment.

**Activity 2 and 3**

Draw the cross-section on the board or use an OHP and ask learners to use it to check their work.

**Remedial**

The number of questions which can be asked from any topographic map extract is almost limitless. If learners have experienced problems, you can nominate other features which they should try to identify from given coordinates. You can also suggest other cross-sections which could be drawn on a copy of the frame from the Learner’s Book.

**Extension**

The following website (Understanding Topographic Maps 1) can be accessed by those learners with an interest in mapwork, and who wish to attempt other exercises in this regard: <http://user.gs.rmit.edu.au/caa/topo/contours.htm>.

Learner’s Book  
pages 327–332  
Duration: 2 hours

**UNIT 3**

**Geographical Information Systems (GISs)**

TERM 3, WEEK 8

**Curriculum and Assessment Policy Statement (CAPS) content**

**Geographical Information Systems (GISs)**

- Examination of a selection of satellite images
- GIS concepts: remote-sensing and resolution
- Spatial and attribute data; vector and raster data
- Data standardisation, data sharing and data security
- Data manipulation: data integration, buffering, querying and statistical analysis
- Developing a ‘paper GIS’ from existing maps, photos or other records on tracing paper

**Resources**

- Learner’s Book pages 327–332
- Websites (optional):
  - [http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0\\_a-gentle-gis-introduction\\_en.pdf](http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0_a-gentle-gis-introduction_en.pdf)
  - [http://linfiniti.com/dla/worksheets/1\\_GISIntro.pdf](http://linfiniti.com/dla/worksheets/1_GISIntro.pdf)

## Preparation

- The Internet resource material on GIS is well worth consulting before presenting this unit to learners.
- GIS is computer-based, but you may be teaching this unit in a classroom without access to a computer or GIS. So, ensure that you understand the theoretical side, and in particular concepts and definitions which are unique to GIS.

## Teaching the unit



### Lesson 1

---

- Begin by asking learners what the difference is between remote-sensing and GIS.
- The first part of the lesson deals with remote-sensing, and the issue of resolution.
- Go through the section, 'What are important GIS concepts?' (pages 327–330) with learners.
- Explain how GIS makes use of remotely-sensed data and can use a variety of spatial data.
- Move on to the theoretical side of GIS, looking at the difference between vector and raster data.



### Lesson 2

---

- Go over the concept of data standardisation (comparing apples with apples).
- Data may also have to be manipulated (integrated, buffered, analysed statistically) before it is suitable for the GIS application. Explain this carefully.
- Go through the section, 'Why are satellite images useful to geographers?' (page 330) with learners.

#### Activity 1

- This activity involves image interpretation (satellite image) in conjunction with a map.
- There is a degree of subjectivity, in that some learners may find it easier to identify features on the image, and others might prefer the map.
- Ideally, image and map should be used in conjunction with one another.

#### Activity 2

- Learners integrate data by means of paper overlays, which results in an economic decision having to be taken.
- Refer back to Modules 3 and 6 if necessary, where similar exercises were undertaken.
- Be prepared for more than one 'correct' answer, but ensure that learners can support their choice.

## Answers

### Activity 1 (Learner's Book, page 331)

Learners should be able to identify the features indicated in the list on page 331 of the Learner's Book and which source (topographic map or satellite image) was of more assistance in each case. There are not necessarily right or wrong answers to the question on useful sources, because some learners might find it easier to use the map, while others find the photo easier. That is why it is best to combine both sources. If names of places are required, the

topographic map will always be necessary. If natural features and vegetation and water (dams, rivers) have to be identified, aerial photos and satellite images are usually best.

**Activity 2** (Learner's Book, page 331)

By studying a completed GIS map, learners are asked where they would site a heavy iron and steel mill. The following will help:

1. The layers used for this map are contours, urban areas, water resources, mineral deposits (coal) and infrastructure (power station, harbour, roads).
2. water; iron ore; labour; coking coal; electricity; transport
3. because the steel mill should not be sited directly upwind of urban areas (pollution risk)
4. E is probably the best locality. It is located close to the harbour, and the railway line. Water can be delivered via pipeline, and electricity via powerline. The labour source lives in the nearby town, and the risk of pollution over the town is low, as the site is not directly upwind. G is definitely unsuitable as a site (in the urban area) and C would not be a good choice (restricted space, immediately downstream of the dam).

### Informal assessment

**Activity 1**

Ask learners to work in pairs to check each other's answers (identified features) and discuss the merits of the different types of spatial data in feature identification.

**Activity 2**

The answer is given above. Once learners have reached their decisions as to where to site the iron and steel mill, you can suggest the sites given in the answer, and see how many learners agree or disagree.

**Remedial**

The definition part of GIS can only really be reinforced by re-teaching, and attempting to ensure that learners master the critical terminology. For the construction of a paper GIS, allow learners who have quickly mastered this activity to assist those who are having obvious difficulty.

**Extension**

Refer to the resources listed on page 138, and provide the names of these websites to those learners who wish to extend their GIS skills.

Learner's Book  
pages 333–336  
Duration: 1 hour

## UNIT 4

## Using atlases (revision)

TERM 3, WEEK 9

### Curriculum and Assessment Policy (CAPS) content

**Using atlases (revision)**

- Examining thematic maps
- Comparing information from different maps

**Resources**

- Learner's Book pages 333–336
- A good school atlas for senior grades (your school should ensure that a teaching set is available)

## Preparation

- Make sure the atlases are in good condition.
- Familiarise yourself with the types of maps (physical, political, economic) and the formats (systematic, thematic) of these maps.
- Importantly, look at the wide range of scales used in an atlas, where everything from the whole world (small-scale) to, possibly, regions (a fairly large-scale) must be covered.

## Teaching the unit



### Lesson 1

- Begin by asking learners: What is an atlas? What different types of atlases are there? (Answers, e.g. road atlas, economic atlas.) Why are there different types of atlases (purposes)?
- Bring in the concept of thematic maps (refer to the Learner's Book, pages 333–335).
- Using the teaching set of atlases, ask learners to identify thematic maps and, in each case, name the theme that is portrayed.

### Activity 1

- This activity is based on the two thematic maps.
- It deals with the questions: What is an example of a theme? What information do thematic maps provide, and (importantly) what do they not provide? At what scale are such maps drawn?

## Answers

### Activity 1 (Learner's Book, page 335)

- a. The map in Figure 8.4.2 represents South African mining and manufacturing industries, and the map in Figure 8.4.3 represents South African agriculture.
  - b. The first photo (A) relates to the map in Figure 8.4.3 (agriculture, in this case hops being grown in the Outeniqua area); and the second photo (B) relates to the map in Figure 8.4.2 (mining, in this case, alluvial diamond mining on the Vaal River near its confluence with the Orange/Gariep River).
  - c. About seven on the agricultural map. There are distinct clusters in the following areas: Western Cape; Northern Cape (Upington); Eastern Cape (Port Elizabeth hinterland); the Durban area; the Lowveld; the Polokwane-Tzaneen area; and a Highveld cluster.  
In the map in Figure 8.4.2, there are four distinct manufacturing clusters: Western Cape–Cape Town; Eastern Cape–Port Elizabeth; KwaZulu-Natal–Durban/Pinetown; and Gauteng. Mining clusters are harder to identify, but a case can be made for clusters centring on Okiep, Sishen, Kimberley, the Free State Witwatersrand goldfields, and the minerals of the eastern Highveld, Mpumalanga (Barberton) and Limpopo.
  - d. No, these are thematic maps showing what and where, but not how much.
2. skills concentrations (human resources); power and infrastructure (roads, railways, harbours, airports)
3.
  - a. Thematic maps focus on one or two themes, and the information regarding these is easy to access. However, they aren't really useful for navigation, and they don't show the height dimension.

- b. Topographic maps can be used for navigation, identification of places, and the contours show relief. However, the maps are cluttered with information, and it is difficult to recognise thematic information. The scale is also too big for the sort of information shown on thematic maps.

### Assessment

#### Task 3:

For information on how to assess the learners' completed tasks, please see pages 202–204 in the Formal Assessment section of this Teacher's Guide.

### Informal assessment

#### Activity 1

This is best done in an open class discussion, as some of the answers to the activity lend themselves to debate and interpretation (i.e. the answers aren't simply right or wrong).

#### Remedial

Do a spot quiz. Ask: Which of the following are not thematic: maize production in South Africa, weather forecast map, road map, wine production in France, heavy industry in China, topographic map? Based on answers, it might be necessary to reinforce the concept of a theme.

#### Extension

Learners could be asked to examine any other maps they come across (for example, on TV, or in books and magazines) and decide if they are thematic or not. If they are, what is the theme?

Learner's Book  
pages 339–340  
Duration: 3 hours

## REVIEW

TERM 3, WEEK 9

These activities provide an opportunity for learners to consolidate concepts and skills learnt in Term 3. Learners can complete them in class or as homework. It is suggested that they complete the activities individually as a means of self-assessment.

You can write the answers on the board for the learners and/or call them out where more appropriate. However, if possible, it is suggested that you photocopy the answers and give them to the learners so that they have them for revision purposes.

#### Activity 1 (Learner's Book, page 339)

1.

Economic activities			
	Economic sectors	Description	Examples
a	primary	extraction of raw materials from nature	mining; agriculture; fishing; forestry
b	secondary	change of form of raw material into a value-added product	iron and steel; wineries; fish canning; the pulp and paper industry
c	tertiary	a service	electricity; restaurant; market; hairdressing; library; police; school
d	quaternary	research and development, or intellectual activities	bio-medical technology; ICT; space exploration; inventions

2. The primary sector comprises extractive activities and adds very little value to the product. Workers are unskilled to do other work; poor community; subsistence farming.
3.
  - a. the tertiary (and quaternary included) economic sector
  - b. the tertiary sector
  - c. the primary economic sector

**Activity 2** (Learner's Book, page 339)

1.
  - a. pie graph
  - b. It shows the sectors or pie wedges, occupied by export destinations; it is colourful; it is visually clear as the wedges differentiate export destinations.
  - c. the percentage market share of South Africa's agricultural exports in 2005
  - d. the SADC countries in southern Africa
  - e. South Africa's fruit and vegetables ripen for the market when the northern hemisphere's output of fruit and vegetables is not available, because south and north have seasonally opposite production.
2. Mediterranean climate in the South Western Cape; subtropical climate in the east and north-east; winter rain for wheat production in the Western Cape; temperate climates on the slopes of mountains; fertile soil; water for irrigation for the eastern half of the country; ports for export of goods
3. poor rainfall for the western half of the country; problems of soil erosion; lack of access to better farming techniques and credit by small farmers
4. access to and availability of adequate food and nutrition to sustain a healthy lifestyle
5. This reduces the threat of food insecurity; provides a basis for self-sufficiency; can encourage entrepreneurship.

**Activity 3** (Learner's Book, page 340)

1.
  - a. Industries that use bulky items are located closest to the raw material, e.g. sugarcane, grapes (wine)
  - b. Unskilled and skilled labour is necessary for industrial development. While unskilled labour is readily available as there is great unemployment, it is more difficult to find labour with the necessary skills. Skilled labour is generally associated with core areas where there is a greater urban population density providing a wide range of skills for industries.
  - c. Transported materials are changed in form and then transferred elsewhere in a different form, e.g. crude oil is refined and sent elsewhere as petrol or diesel.
2. Accelerated Growth Initiative; IDZs; SDIs
3. automotive industry; chemical industry; agri-industries; metals; clothing; footwear
4.
  - a. raw materials include fish; minerals; farm produce; raw materials are needed in the mining industry, manufacturing industry, etc.
  - b. Unskilled and skilled labour are necessary for the development in the industrial field. Although unskilled labour is freely available because of high unemployment, it is more difficult to find labour with the necessary skills. Skilled labour is normally restricted to areas where there are bigger urban population density and therefore offer a wider range of skills to the industrial field.
  - c. Transport infrastructure of road, rail, air and sea encourages the movement of people and goods.

5. It represents investment in an economically disadvantaged area of South Africa; it helps decentralise the concentration of industries; it provides a very deep harbour for ships; it has plenty of space for expansion; it has a large labour supply of unskilled and skilled labour from the Port Elizabeth-Uitenhage area.

**Test 2:**

Turn to pages 204–208 in the Formal assessment section of this Teacher's Guide for information on how to assess learner's tests.

**Activity 4** (Learner's Book, page 340)

1. The Maputo Corridor; Beira Development Corridor; Walvis Bay Development Corridor
2. It provides a distribution route for exported goods; it creates job opportunities along a transport route.
3. Acts as a magnet for other similar industries; has a skilled labour pool; has allied services; has component industries.
4. strain on the environment; strain on service delivery, e.g. water, electricity, housing, clinics, schools; informal settlements develop; roads are insufficient; competition for work increases; unemployment issues; social tension if service delivery is not addressed
5. The informal sector provides: key services and goods; job opportunities for the least educated; employment and wages, which stimulates the economy.
6. You don't have to register the business; it can open or shut down quickly in response to economic cycles; premises are not needed for businesses.
7. Women are vulnerable; they are often paid the least money; there are no unemployment or sickness benefits; there is no maternity leave paid out; there is no job security.
8. Government needs the tax they could raise from the informal sector; they need to recognise the informal sector as it provides job opportunities and makes people more self-sufficient; they need to devise a simpler way to register businesses to accommodate informal business owners.

	<b>MODULE 9</b>	
TERM 4 Learner's Book pages 341–372 Duration: 15 hours	<b>REVISION</b>	

Learner's Book pages 343–349 Duration: 3 hours	<b>UNIT 1</b>	<b>Climate and weather (regional and local weather systems)</b>
		<b>TERM 4, WEEK 1</b>

The focus of this unit is on systematically revising the work associated with climate and weather (regional and local weather systems) which learners have covered in Grade 12, in preparation for the final end-of-year examination. This unit revises work that relates to Module 1 in the Learner's Book.

### **Curriculum and Assessment Policy (CAPS) content**

#### **Mid-latitude cyclones**

- General characteristics
- Areas where mid-latitude cyclones form
- Conditions necessary for their formation
- Stages of development and related weather conditions
- Weather patterns associated with cold, warm, and occluded fronts
- Reading and interpreting satellite images and synoptic weather maps

#### **Tropical cyclones**

- General characteristics
- Areas where tropical cyclones form
- Factors necessary for their formation
- Stages of development
- Associated weather patterns
- Reading and interpreting satellite images and synoptic weather maps
- Case study of one recent tropical cyclone that affected southern Africa
- Impact of tropical cyclones on human activities and the environment
- Strategies that help to prepare for and manage the effects of tropical cyclones

#### **Subtropical anticyclones and associated weather conditions**

- Location of the high-pressure cells that affect South Africa
- General characteristics of these high-pressure cells
- Anticyclonic air circulation around South Africa, and its influence on weather and climate
- Travelling disturbances associated with anticyclonic circulation: moisture front, line thunderstorms, coastal low-pressure systems and South African berg winds
- Reading and interpreting satellite images and synoptic weather maps that illustrate weather associated with subtropical anticyclonic conditions



### **Valley climates**

- The microclimate of valleys (the effect of the slope aspect)
- Development of anabatic and katabatic winds, inversions, frost pockets and radiation fog
- The influence of local climates on human activities such as settlement and farming

### **Urban climates**

- Reasons for differences between rural and urban climates
- Urban heat islands – causes and effects
- Concept of pollution domes – causes and effects
- Strategies to reduce the heat island effect

### **Key geographical skills and techniques**

- using verbal, quantitative and symbolic data forms such as text, pictures, graph tables, diagrams and maps
- processing, interpreting and evaluating data

### **Resources**

Learner's Book pages 343–349

### **Preparation**

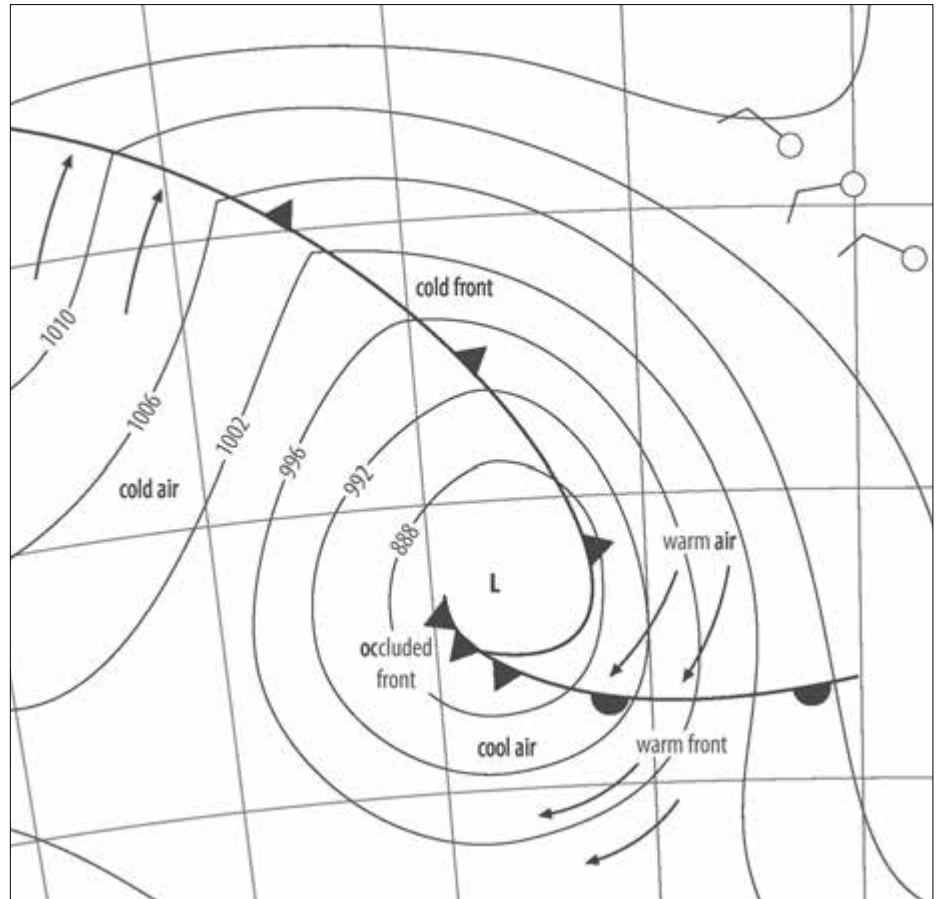
- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to Module 1 in the Learner's Book.
- Refer to Grades 10 and 11 where learners have received a background in climate and weather, on which this unit builds.

### **Teaching the unit**

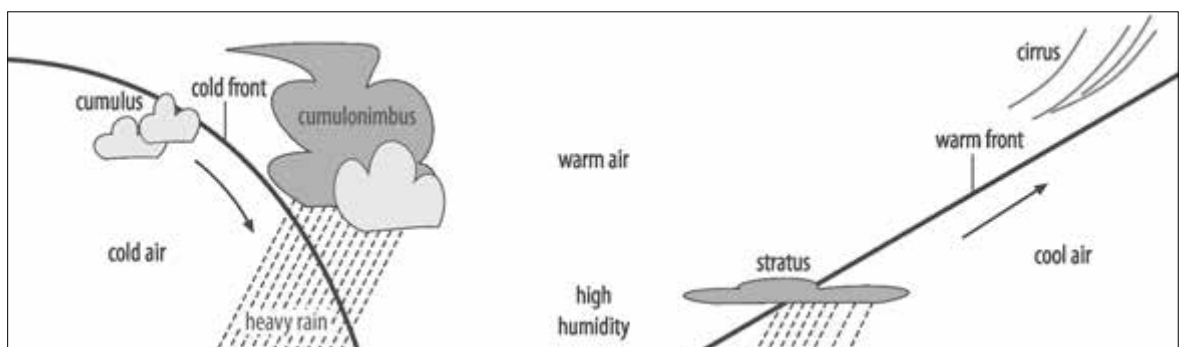
- Start by asking learners what sections they have covered under climate and weather. Ask them what they have learnt about mid-latitude cyclones, tropical cyclones, subtropical anticyclones and associated weather conditions, valley climates, and urban climates.
- Go through the text on pages 343–349 in the Learner's Book with learners.
- Explain that the revision activities will familiarise learners with the way in which the content could be tested or examined.

## Answers

### Activity 1 (Learner's Book, page 346)



Synoptic weather map



Weather produced by a mid-latitude cyclone

### Activity 2 (Learner's Book, page 346)

- The cyclone originated from an area of convection in the Mozambique Channel. As the convection became a pattern of intense rainbands, an upper-level anticyclone helped the cyclone's development. On 18 January, the Joint Typhoon Warning Centre (JTWC) issued a tropical cyclone formation alert to say that there was a high chance of the system becoming a tropical cyclone. The cyclone was moving south-west. Once the eye was well established, Funso quickly intensified, with winds reaching hurricane speeds of  $200 \text{ km.h}^{-1}$ . The cyclone then turned west and headed for Mozambique. On 21 January it was 110 km east of Quelimane. The storm weakened while over the Mozambique coastline, then moved away out to sea and revived; the eye reformed and the cyclone reached category four intensity.

- b. Four tropical cyclones formed before Eline did in the south-west Indian Ocean tropical cyclone season from December 23<sup>rd</sup> 1999 until February 2000.
- c. Learners can check their answers on page 22 of the Learner's Book, Figure 1.2.1.
- d. A ship carrying 54 passengers from Anjouan to Mayotte in the Comoros sank in rough seas; many passengers drowned or went missing. In Mozambique, 3 million people were affected by the storm-force winds and flooding. Zambezia Province was worst affected. Huts were flattened and trees ripped out. Several thousand people were left homeless and without clean drinking water. Torrential rains kept residents in Maputo indoors, and the capital's waterside was swamped as drainage systems struggled to channel the waters to the sea. Incessant rains in neighbouring countries also drove up the levels of rivers flowing into Mozambique. The Komati River flooded, washing away 50 m of Mozambique's main north-south highway, the EN1, 100 km north of Maputo. For a few days, the vast country was cut off by road from its capital. In Malawi, the cyclone brought downpours that swelled two rivers near Nsanje and made them flood their banks. Many people lost their homes or had to evacuate. Villages were cut off when roads and bridges were destroyed; flooding killed livestock and damaged maize crops, bringing the threat of starvation.
- e. The majority of the population are subsistence farmers, with crops planted in low-lying areas. This puts them completely at the mercy of the forces of nature. No precaution and warning systems; poor infrastructure.

**Activity 3** (Learner's Book, page 347)

1.
  - a. In summer, the Kalahari High lifts as temperatures increase. This allows the cool air and warm air to meet, and a moisture front develops along the trough of low pressure. As shown in Figure 9.1.9, the moisture front runs as a diagonal line across South Africa's interior, from north-west to south-east. Line thunderstorms develop along the moisture front, where the cool air lifts the warm air. The warm air rises high, forming cumulonimbus clouds, which produce heavy rain and sometimes hail in the late afternoon or evening. These line thunderstorms move eastwards over the country.
  - b. summer
  - c. The Kalahari High rises vertically in Summer.
2.
  - a. In winter, before the approach of a mid-latitude cyclone, air flows from the Kalahari High (which is strong in winter) to the coastal low. As the dry, warm air descends from the plateau down the escarpment, it is warmed up further by adiabatic descent or compression. The result is a hot, dry berg wind. It lasts for a few days (one to three), and makes its way anticlockwise along the coast, until it is replaced by a cold front. A berg wind often increases the risk of veld fires. Berg winds and coastal lows are most noticeable in winter, but they take place at other times of the year too.
  - b. winter
  - c. coastal lows

**Activity 4** (Learner's Book, page 348)

1. Anabatic winds are winds which blow upslope, while katabatic winds blow downslope. Technically, these winds are not exactly the same as valley (daytime) and mountain (night time) breezes, even though valley breezes are anabatic (upslope) and mountain breezes are katabatic (downslope).

True anabatic winds are driven by differential heating of air on a slope; they are not simply part of a valley circulation pattern, which is based on day and night slope temperature differences. Anabatic winds occur on a regional scale. Their source is a pool of cool air on the downslope side, and they blow upslope during the day (see Figure 9.1.11 on page 348 of the Learner's Book).

Katabatic winds usually come from a cold, upslope or interior plateau source (see again Figure 9.1.11.). For example, ice cold katabatic winds blow off Antarctica towards the ocean. However, warm katabatic winds can also occur where dry air is forced to descend a mountain slope and the air warms by compression (the bicycle pump effect). True katabatic winds do not blow only at night, and they occur on a regional, rather than a local, scale. Examples are the Chinook of North America, the Föhn of central Europe, or our own hot, dry berg winds..

2. a. Inversion is a reversal of the normal pattern of air temperature change. Usually, air close to the ground is warmer than the air above it. With inversion, air close to the ground is cooler than the air above it. Inversion takes place on still, cold winter nights in valleys. The heavy, cold air above the slopes sinks down the slopes to the valley floor. The air above the slopes cools faster than the air at a similar height above the valley. The cold air that collects at the bottom is dense and cannot rise. It is trapped under a layer or 'lid' of warmer air.  
b. thermal belt

**Activity 5** (Learner's Book, page 349)

1. The causes of the urban heat island phenomenon include:
  - The low albedo of materials such as concrete, brick and tar used to build cities: These materials absorb heat, rather than reflect it.
  - The shape of cities: Tall buildings trap heat (or radiation) near the ground.
  - Air pollution: This helps to trap the heat. For example, carbon dioxide (a product of burning or combustion) absorbs outgoing long-wave radiation.
  - The high number of inhabitants: The more people there are in a city, the more heat-generating human activity there is.
2. The causes of pollution domes are air pollution, such as domestic fires, car exhaust fumes and the burning of fossil fuels, combined with still conditions, which block air circulation that would normally disperse the pollution.

The effects of pollution domes are the following:

- Incoming sunlight (or insolation) is blocked during the day, but heat is trapped at night. This is why the temperature differences between urban and rural areas are greatest at night.
- Increased precipitation, because smoke and other pollutant particles act as condensation nuclei.
- The pollution itself triggers allergic reactions, breathing difficulties and asthma attacks for some people.

The focus of this unit is on systematically revising the work associated with geomorphology that learners have covered in Grade 12, in preparation for the final end-of-year examination. The unit revises work that relates to Module 2 in the Learner's Book.

### **Curriculum and Assessment Policy (CAPS) content**

#### **Drainage systems in South Africa**

- Important concepts: drainage basin, catchment area, river system, watershed, tributary, river mouth, source, confluence, water table, surface run-off and groundwater
- Types of rivers: permanent, periodic, episodic and exotic
- Drainage patterns: dendritic, trellis, rectangular, radial, centripetal, deranged and parallel
- Drainage density
- Use of topographic maps to identify stream order and density
- Discharge of a river: laminar and turbulent flow

#### **Fluvial processes**

- River profiles: transverse profile, longitudinal profile and their relationship to different stages of a river
- Identification and description of fluvial landforms: meanders, oxbow lakes, braided streams, floodplains, natural levees, waterfalls, rapids and deltas
- River grading
- Rejuvenation of rivers: reasons and resultant features, such as knick points, terraces and incised meanders
- River capture (stream piracy): the concepts of abstraction and river capture; features associated with river capture (captor stream, captured stream, misfit stream, elbow of capture, wind gap)
- Superimposed and antecedent drainage patterns

#### **Catchment and river management**

- Importance of managing drainage basins and catchment areas
- Impact of people on drainage basins and catchment areas
- Case study of one catchment area management strategy in South Africa

### **Key geographical skills and techniques**

- using verbal, quantitative and symbolic data forms such as text, pictures, graph tables, diagrams and maps
- processing, interpreting and evaluating data

### **Resources**

Learner's Book pages 350–352

## Preparation

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to Module 2 in the Learner's Book.
- Refer to Grades 10 and 11 where learners have received a background in geomorphology, on which this unit builds.

## Teaching the unit

- Start by asking learners what sections they have covered under geomorphology. Ask them what they have learnt about drainage systems in South Africa, fluvial processes, catchment and river management and key geographical skills and techniques.
- Go through the text on pages 350–352 in the Learner's Book with learners.
- Explain that the revision activities will familiarise learners with the way in which the content could be tested or examined.

## Answers

### Activity 1 (Learner's Book, page 351)

1. Permanent rivers (also called perennial rivers) are always fed by groundwater and so they flow throughout the year, even though their levels of water fluctuate. They are common in wet climates. Most of these rivers empty into oceans.  
Periodic rivers are fed by groundwater only in the rainy season, when the water table is above the level of the riverbed. The flow in these rivers is, therefore, seasonal. Periodic rivers are a feature of drier climates. Many of these rivers do not reach the sea, but empty into inland drainage basins.  
Episodic rivers never receive groundwater and flow only after an episode of heavy rain. These rivers are a feature of very dry climates.  
Exotic rivers span more than one climatic region. They begin in a wet region and flow through a dry region. South Africa's Orange/Gariep River is an exotic river. It carries enough water to reach the sea, in spite of the dry Northern Cape region it flows through.
2.
  - a. Learners can check their labels against those in Figure 2.1.10 on page 63 of the Learner's Book.
  - b. dendritic
  - c. a branching tree-like pattern with tributaries
  - d. The drainage basin with high drainage density is underlain by silty clay with a high run-off potential. The drainage basin with low drainage density is underlain by porous material with a lower run-off potential.
  - e. Discharge is a measure of how much water flows past a point on a river (at a gauging station) every second. It depends on the size of the river and how fast its water flows. The wider and deeper the river channel, the greater the discharge will be. The gradient of the river, the vegetation and rock formation play an important role.

**Activity 2** (Learner's Book, page 352)

1. a. River rejuvenation produces the following:  
A knickpoint: A sharp change in a river's slope due to a change in base level. The knickpoint marks the old base level. The gradient upstream of the knickpoint is gentle, while the gradient downstream is steep. However, the steep gradient will gradually be eroded to form a graded profile.  
Terraces: Steps in the floodplain which form as a rejuvenated river erodes a new valley within the old one. Each terrace consists of a flat surface (a tread) and a steep slope (a scarp).  
Incised meanders: Deep, steep-sided meanders formed by heavy vertical erosion of existing meanders. Incised meanders form when a river cuts down faster than it can change its meandering course.
- b. i. waterfalls; rapids.  
ii. braided streams; natural levees; deltas  
iii. meanders and oxbow lakes; floodplains
2. Learners can check their labelled diagrams by looking at Figure 2.2.29 on page 87 of the Learner's Book.
3. A = antecedent  
B = superimposed

**Activity 3** (Learner's Book, page 352)

Human activities affect water quantity, water quality and flow patterns in river catchments. Because a catchment includes the land that drains a river network, we can harm rivers without even going near them. Land uses such as agriculture, mining, urbanisation and industry put strain on river systems and groundwater. The mind map in Figure 2.3.6 on page 96 of the Learner's Book summarises the impact of humans on catchments.

Learner's Book  
pages 353–357  
Duration: 1½ hours

**Unit 3**

**Rural settlements**

**TERM 4, WEEK 2**

The focus of this unit is on systematically revising the work associated with rural settlements that learners have covered in Grade 12, in preparation for the final end-of-year examination. The unit revises work that relates to Module 4 in the Learner's Book.

**Curriculum Assessment Policy Statement (CAPS) content**

**Study of settlements**

- Concept of settlement
- Site and situation
- Rural and urban settlements
- Settlement classification according to size, complexity, pattern and function

### **Rural settlements**

- How site and situation affect the location of rural settlements
- Classification of rural settlements according to pattern and function
- Reasons for different shapes of settlements: round, linear, T-shaped and crossroads
- Land use in rural settlements

### **Rural settlement issues**

- Rural-urban migration
- Causes and consequences of rural depopulation on people and the economy
- Case study that illustrates effects of rural depopulation and strategies to address them
- Social justice issues in rural areas, such as access to resources and land reform

### **Key geographical skills and techniques**

- processing, interpreting and evaluating data
- identifying questions and issues
- collecting and structuring information
- making decisions and judgements
- deciding on a point of view
- suggesting solutions to problems
- working co-operatively and independently
- applying communication, thinking, practical and social skills
- interpreting sources
- using verbal, quantitative and symbolic data forms such as text, pictures, graphs, tables, diagrams and maps

### **Resources**

- Learner's Book pages 353–357
- Map of the world or atlases for reference in class

### **Preparation**

Read through and familiarise yourself with the content.

### **Teaching the unit**

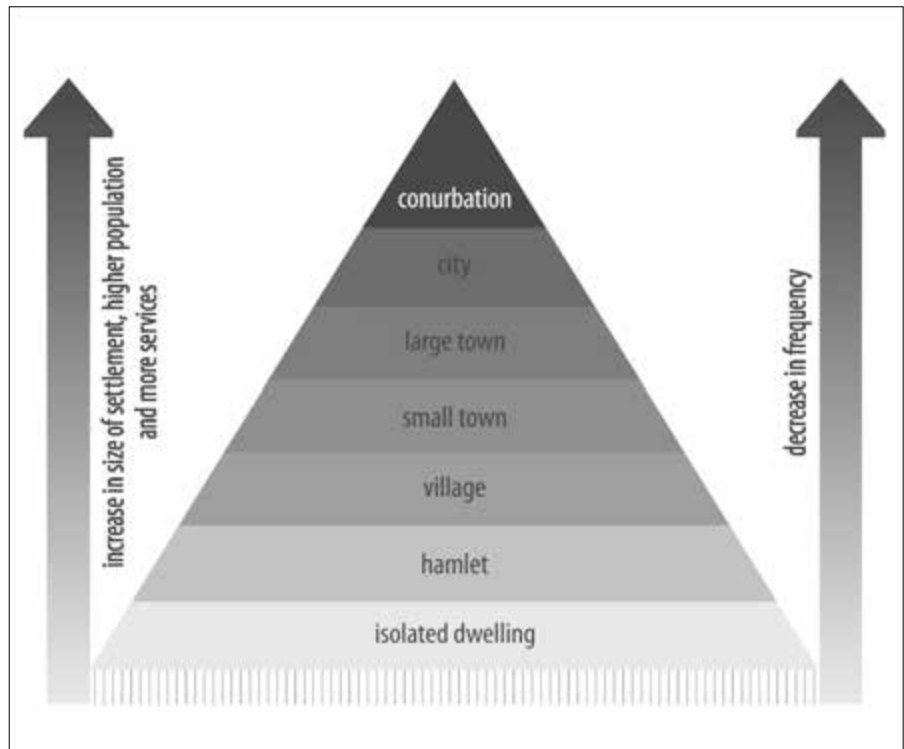
- Learners should understand that settlement is a dynamic process – from simple beginnings in rural areas to vast urban areas that merge into each other to form an almost continuous spread of urban dwellings.
- Refer learners to the maps in Module 3, Unit 1 of the Learner's Book (Figures 4.1.1– 4.1.4) and ask them to find these areas on a map of the world, and/or in an atlas.
- Ensure that learners understand these terms and concepts:
  - ekistics: the study of settlements
  - metropolis: an urban area of over 1 million people
  - megaregion: a large urban area of over 7 million people
  - ecumenopolis: a city of up to 50 million people or more.
- Go through pages 353–355 of the Learner's Book with learners.
- Explain that the revision activities will familiarise learners with the way in which the content could be tested or examined.



## Answers

### Activity 1 (Learner's Book, page 356)

1. The concept of settlement describes where people live.
2. Site is the exact physical location of a settlement. Situation refers to how other factors interact to affect the choice of developing a settlement at a site. OR  
A site of a settlement is controlled by external physical and climatic factors. The situation of a settlement is controlled by human factors.
3. Learner's need to take into account all the physical and climatic factors and then substantiate their opinion about why the physical geography of an area is the chief factor that affects site.
4. Answers should include the idea that urban and rural settlements can be classified according to: size; complexity; pattern; or function. A rural settlement is associated with the countryside. The settlement is usually found in land which is largely undeveloped. It may be located on the edge of forestry or large grazing lands, or surrounded by agricultural fields. An urban settlement is associated with greater development and visible infrastructure.
5. Answers will differ, but should include the following points: rural and urban are not opposites but part of a continuum; transition between rural and urban can be gradual; functions merge, services and housing types merge.
6.
  - a. Britain (or any European Union country): The United Kingdom classifies a rural area as any area with fewer than 10 000 people. The European Union (EU) chooses to distinguish rural areas from urban areas by analysing differences in economic activities, land use, infrastructure, human resources and skills, and even the travelling distances to the nearest schools or hospitals. They also use physical features to differentiate rural and urban areas, such as dominant land cover and a description of topography.
  - b. South Africa: Prior to 1994, rural settlements referred to farms, informal settlements that were not in towns, wilderness and forestry areas, small towns and villages. Farms belonged to members of the white population, and apart from them, most people who lived in rural areas were black people. From 1913 the white-only government, practised a policy of relocating black people to the rural areas – to the so-called 'reserves'. In 1948, the Nationalist Party came into power. In 1951, they put 13% of the country aside as 'bantustans' or 'homelands' for the indigenous ethnic groups. These homelands were rural in character. After 1994, they became part of the new provinces of South Africa. So, in South Africa, the legacy of the word 'rural' implies an area that is inhabited largely by black people.
  - c. The USA: The United States of America classifies urban areas according to a combination of population number and population density. An urban areas has a population of 50 000 people or more, and a population density of 1 000 people or more per square mile. Any place with a population of 2 500 or fewer, and a density of less than 500 people per square mile, is classified as a rural area.
7. Learners could provide the diagram on page 157 or a variation of it, or they could list the settlement types according to size, from smallest to largest.



8. Learners should mention: differences in extent of the settlement; in size of the population; in the density of the population numbers.
9. dispersed settlement: isolated houses, or groups of buildings that are scattered over land and 2–4 km distant from each other  
nucleated settlement: a cluster of houses grouped together
10. Ensure that learners expand on the mind map on page 353. Tell them to read through Module 4 and as they read to make notes of key points under each heading.

**Activity 2** (Learner's Book, page 356)

1.
  - a. Positive effect: Land use can positively affect natural resources if resources are used in a sustainable way and given time to regenerate; can bring about more sustainable economic and human development.
  - b. Negative effect: Land use can negatively affect natural resources if they are taken in an unsustainable way with little concern for conservation or protection for the future; land cover can be affected and if not properly managed can cause degradation of areas, and increase the rate of desertification.
2. because an isolated settlement often only has one building or a farm with barns and no shape
3. A = isolated; B = nucleated and linear; C = dispersed; D = round and nuclear

**Activity 3** (Learner's Book, page 357)

1. The move away from rural areas towards cities and urban areas.
2. Learners could mention any three of the points listed in the table on page 158 under 'push' and 'pull' factors.

Push causes of rural depopulation	Pull causes of rural depopulation
degradation of land through poor farming methods	economic job opportunities
reduced soil fertility	diverse labour opportunities
soil erosion	better range of housing
increasing desertification of marginal land	transport, communication networks
erratic weather caused by climate changes	independence from erratic weather
droughts	independence from extreme weather
floods	wide range of services, e.g. shops
crop and/or livestock diseases	attraction of the 'city lights'
reduced carrying capacity of the land	diverse entertainment
reduced farm sizes through inheritance	more reliable source of food
redundancy caused by mechanical innovations	independence from family
poor economic returns on long hours of labour	safety from tribal conflict areas

3. Learners could mention any three factors found on Table 4.3.2 of the Learner's Book (page 187).
4. Learners could mention any of the following: rural development strategies and programmes to help alleviate rural poverty, address the effects of rural depopulation and create economic opportunities; addressing social justice issues; on an international level being a signatory to agreements concerned with addressing rural poverty, sustainable agriculture, land degradation, desertification, food security, shelter, basic services and the provision of employment opportunities.
5. To resolve land claims and restore land rights to those people whose land had been taken from them, or to award alternative forms of equitable settlement to communities, people, or the descendants of people who lost their land as a result of discriminatory laws.
6. social justice issues
7. It empowers the Chief Land Claims Commissioner to arrange legal representation for any claimant who cannot afford to do so him- or herself.

Learner's Book  
pages 358–360  
Duration: 1½ hours

## Unit 4

## Urban settlements

TERM 4, WEEK 2

The focus of this unit is on systematically revising the work associated with urban settlements that learners have covered in Grade 12, in preparation for the final end-of-year examination. The unit revises work that relates to Module 5 in the Learner's Book.

## **Curriculum Assessment Policy Statement (CAPS) content**

### **Urban settlements**

- The origin and development of urban settlements – urbanisation of the world's population
- How site and situation affect the location of urban settlements
- Classification of urban settlements according to function, such as central places, trade and transport, break-of-bulk points, specialised cities, junction towns and gateway towns or gap towns

### **Urban hierarchies**

- The concepts of urban hierarchy, central place, threshold population, sphere of influence and range of goods
- Lower- and higher-order functions and services
- Lower- and higher-order centres

### **Urban structure and patterns**

- Internal structure and patterns of urban settlements: land use zones; concept of urban profile; and factors influencing the morphological structure of a city
- Models of urban structure, such as multiple-nuclei model, the modern American-Western city, the Third World city and the South African city
- Changing urban patterns and land use in South African cities

### **Urban settlement issues**

- Recent urbanisation patterns in South Africa
- Urban issues related to rapid urbanisation: lack of planning, housing shortage, overcrowding, traffic congestion and problems with service provision
- The growth of informal settlements and associated issues: case studies from the world and South Africa
- Case studies that show how selected urban areas in South Africa are managing urban challenges, and handling environmental, economic, and social justice concerns

### **Key geographical skills and techniques**

- using verbal, quantitative and symbolic data forms such as text, pictures, graphs, tables, diagrams and maps
- processing, interpreting and evaluating data

### **Resources**

Learner's Book pages 358–360

### **Preparation**

Read through and familiarise yourself with the content.

### **Teaching the unit**

- Go through pages 358 and 359 of the Learner's Book with learners.
- Explain that these revision exercises will familiarise learners with the way in which the content could be tested or examined.

## Answers

### Activity 1 (Learner's Book, page 360)

1. the growth and development of the urban areas of the world
- 2.

Type of urban settlement	Definition	Examples
central place	a settlement that provides goods and services to the surrounding population	Johannesburg, Queenstown
break-of-bulk point	a town where goods are unloaded and one form of transport is changed for another – such as a port town	Richards Bay, Port Elizabeth
junction town	a town formed at a rail or road intersection	De Aar, Beaufort West
gateway town	a town that travellers or visitors pass through to reach other towns	Johannesburg, Cape Town
gap town	a town located in a valley that is open at both ends/at the foot of a mountain pass	Worcester, Montagu
specialised town	a town with a particular, dominant function	Plettenberg Bay (tourist town), Grahamstown (university town)

### Activity 2 (Learner's Book, page 360)

1. Refer to Figure 5.2.1 on page 208 of the Learner's Book.
2. any settlement that provides goods and services (for smaller, neighbouring settlements)
3. Examples will differ. Low-order should include, for example, post office, shops, pubs, shebeens; middle-order, for example, supermarkets and restaurants; high-order, for example, department stores, hospitals, cinemas, leisure centre.

### Activity 3 (Learner's Book, page 360)

1. a. Central Business District – the commercial and often the geographical heart of the city  
b. an area in which land use is mixed or changing/outskirts of city and beginning of the countryside
2. Refer to Figure 5.3.4 on page 217 of the Learner's Book.
3. An American-Western city best fits the multiple-nuclei model. Features include: decentralisation; suburbanisation, and the formation of edge cities. A Third World city in the developing world: many have a colonial history and, because of this, they have a dual city structure. They have two city centres or CBDs – one traditional and one modern; impoverished informal settlements are common.  
A South African city best matches the modern American-Western city, but also features the informal settlements characteristic of Third World cities. The distinguishing feature of South African cities is the legacy of apartheid urban planning in which non-whites were segregated from whites in designated townships. The suburbs and townships generally remain racially and economically segregated to this day.

4. Learners should mention the following concepts: invasion and succession; urban decay; urban renewal; edge cities; gated communities.

**Activity 4** (Learner's Book, page 360)

1. Learners need to elaborate on and give examples of urban settlement issues such as:
  - recent urbanisation patterns in South Africa
  - urban issues related to rapid urbanisation: lack of planning; housing shortage; overcrowding; traffic congestion, problems with service provision
  - the growth of informal settlements and associated issues
  - how selected urban areas in South Africa are managing urban challenges; handling environmental, economic, and social justice concerns.
2. a. Answers will differ but should include: overcrowded conditions; lack of infrastructure, e.g. roads, gutters, sewage system, running water; unhealthy living conditions; lack of good quality nutrition; spread of diseases and infections; unemployment; poverty; crime and violence; drug and alcohol abuse.  
b. Answers will differ. Ensure that learners back up their opinions with reasons.
3. Answers will differ but could include: better transport systems; community development projects; better service delivery; improving the delivery rate of formal housing opportunities; increasing investment through planning and marketing; apprenticeship programmes to the Water, Sanitation, Electricity, Stormwater, Solid Waste, Refuse Removal and Roads Departments; encouraging recycling; tree planting; peri-urban agricultural schemes.

Learner's Book  
pages 361–365  
Duration: 3 hours

## UNIT 5

## Economic geography of South Africa

TERM 4, WEEK 3

The focus of this unit is on systematically revising the work associated with economic geography which learners have covered in Grade 12, in preparation for the final end-of-year examination. The unit revises work that relates to Module 7 in the Learner's Book.

### Curriculum Assessment Policy Statement (CAPS) content

#### Structure of the economy

- Economic sectors (primary, secondary, tertiary and quaternary)
- Economic sectors' contribution to the SA economy: value and employment
- Use of statistical and graphical information

#### Agriculture

- Contribution of agriculture to the SA economy
- The role of small-scale farmers and large-scale farmers
- Main products produced: home market and export market
- Factors that favour and hinder agriculture in SA, such as climate, soil, land ownership and trade
- The importance of food security in South Africa – influencing factors
- Case studies related to food security in South Africa

### **Mining**

- Contribution of mining to the SA economy
- Significance of mining to the development of SA
- Factors that favour and hinder mining in SA
- A case study of one of SA's main minerals in relation to the above points

### **Secondary and tertiary sectors**

- Contribution of secondary and tertiary sectors to the SA economy
- Types of industries, such as heavy, light, raw material orientated, market orientated, footloose industries, ubiquitous industries, bridge (break-of-bulk point) industries
- Factors influencing industrial development in South Africa, such as raw materials, labour supply, transport infrastructure, political intervention, competition and trade
- South Africa's industrial regions:
  - PWV-Gauteng, Durban-Pinetown, Port Elizabeth-Uitenhage, South Western Cape Metropole
  - Factors influencing their location
  - Main industrial activities
- Case studies from South Africa to illustrate the above

### **Strategies for industrial development**

- Overview of apartheid and post-apartheid industrial development strategies
- Concept and distribution of Industrial Development Zones (IDZs)
- Case studies of two Spatial Development Initiatives (SDIs)
- Issues associated with industrial centralisation and decentralisation

### **Informal sector**

- Concept and characteristics of informal sector employment
- Reasons for high informal sector employment in South Africa
- Challenges facing SA's informal sector
- Case studies to illustrate the above in the South African context

### **Key geographical skills and techniques**

- processing, interpreting and evaluating data
- identifying questions and issues
- collecting and structuring information
- making decisions and judgements
- deciding on a point of view
- suggesting solutions to problems
- working co-operatively and independently
- applying communication, thinking, practical and social skills
- interpreting sources
- using verbal, quantitative and symbolic data forms such as text, pictures, graphs, tables, diagrams and maps

### **Resources**

Learner's Book pages 361–365

### **Preparation**

Read through and familiarise yourself with the content.

## Teaching the unit

Go through pages 361–364 of the Learner’s Book with learners.

### Answers

#### Activity 1 (Learners’ Book, page 364)

One moves from the primary towards the quaternary, increasing in value added to the activity and in the complexity of the task.

#### Activity 2 (Learners’ Book, page 364)

1. A dual agricultural economy means it has two aspects: commercial and subsistence farming.
2. a. The direct contribution to the economy is in the form of an actual:
  - percentage contribution to the GDP
  - percentage of workforce employed in labour
  - percentage contribution from exports to the GNP.The indirect contribution to the economy comprises forward and backward links to farmers, the supply of food, and informal labour.
3. Examples:
  - Roles: small-scale size – financial turnover; investment; output; number of employees; value of fixed capital  
large-scale size – machinery; hybrid seeds; irrigation; division of labour; access to capital; access to markets; access to refrigerated transport
  - Products: domestic – maize; wheat; sugar, fruits  
export – maize; avocados; ostrich; grapefruit; plums; rooibos tea
  - Factors that affect agriculture: positive – climate; soil; land ownership; trade  
negative – climate; soil; land ownership; trade

#### Activity 3 (Learners’ Book, page 364)

1. Accept any of the following: contributes 8,6% directly to the GDP of South Africa; is responsible for 60% of South Africa’s exports; earns approximately 50% of South Africa’s foreign exchange; contributes 13,2% of the total tax received from companies by the government; contributes R78 billion to wages and salaries; uses 15% of South Africa’s electricity supply; directly contributes to the employment of approximately 500 000 people; attracts 12% of the total foreign investment in South Africa; spent R409 billion in South Africa on purchases and operating costs; directly contributes 50% of the volume of traffic through Transnet’s ports and railways.
2. Indirectly, mining stimulates the economy through the multiplier effect: jobs in mining give money; money creates demand for goods and services; goods and services develop; more money in salaries continues the cycle of demand and growth.
3. Mining needs infrastructure; this is how ISCOR and ESKOM began; roads and railways and harbours were developed to bring in machinery and to export ore; industrial development catered to the needs of the mining community; the multiplier effect led to diversification of industries and services.
4. Examples:
  - Contribution of mining to the economy of South Africa: direct – add a minimum of two examples from the answer to question 1 above; indirect – a range of industrial goods, e.g. cars, kettles, shoes, and services, e.g. higher education, Internet services, train service



- Significance of mining to the development of SA: labour – skilled and unskilled labour brought in; politics – control over the mining areas/ strategic minerals
- Factors affecting mining: positive – physical, economic, social (the sub-headings are the same for the positive and negative factors affecting mining; the learner needs to apply them appropriately and give a minimum of two examples of each); negative – physical, economic, social (the subheadings are the same for the positive and negative factors affecting mining; the learner needs to apply them appropriately and give a minimum of two examples of each)
- Practical knowledge: Marikana mine strike; drop in investment in South Africa; drop in output of strategic mineral; buyers go elsewhere; drop in salaries and wages; drop in demand in the country for goods and services

**Activity 4** (Learners' Book, page 365)

1. Contribution to the SA economy:  
The secondary sector – look at Table 7.4.1 on page 296 of the Learner's Book.  
The tertiary industry in South Africa has shown the greatest expansion in recent years. This follows development trends that indicate more people are involved in services as economies become increasingly sophisticated. Look at Table 7.4.2 on page 297 of the Learner's Book.
2. Types of industries: Learners could mention:  
Volume – heavy industries = power stations, ship-building; light industries = shoe factories, jewellery design  
Location – raw material orientated = sugar refining; market oriented = fashion industry; footloose = software companies; ubiquitous = bakeries  
Function – bridge or break-of-bulk point industries = oil refineries
3. Factors influencing industrial development in SA: Learners could mention:  
Political factors – Accelerated Growth Initiative; IDZs; SDIs  
Resources – rich resource base; labour supply  
Infrastructure – road; rail; harbours; airports; electricity
4. SA's industrial regions: Learners could mention:  
PVW-Gauteng – iron and steel; car industries  
Port Elizabeth-Uitenhage – textiles; car industries; salt  
Durban-Pinetown – sugar; aluminium; subtropical fruit and nuts  
South Western Cape Metropole – fruit juice; wine; canned fruit; frozen and  
canned fish

**Activity 5** (Learners' Book, page 365)

1. a. apartheid-era industrial development strategies – IDC; Viljoen Commission; Kleu Commission  
b. post-apartheid industrial development strategies – SDI; GEAR; IDZs
2. a. Industrial Development Zones are areas identified by Government for stimulating: economic growth through investment in industries.  
b. Port Elizabeth (the Coega IDZ); East London (ELIDZ); Richards Bay (RBIDZ); Gauteng (OR Tambo International Airport)
3. a. The Spatial Development Initiatives or SDIs identify areas where there is potential for economic growth. The objective of the SDIs is that the investment is sustainable at both state and municipal levels.  
b. Richards Bay-Empangeni SDI/ Fish River SDI; Wild Coast SDI

4. a. centralisation – magnet for other industries; lower production costs; similar services; skilled labour pool; pressure on resources; pollution; traffic congestion
- b. decentralisation – need for growth nodes in peripheral areas; need to lessen strain on main industrial regions; need to provide job opportunities in previously disadvantaged areas

**Activity 6** (Learner's Book, page 365)

1. a. Informal sector employment refers to its lack of formal legal registration and responsibilities.
- b. Characteristics of informal sector employment: There is no legal registration of the business; there are no legal contracts of employment because there is no legal business officially recognised; informal entrepreneurs cannot sue or be sued because they are not legal entities; employees have no access to the CCMA (Commission for Conciliation, Mediation and Arbitration) or labour courts; no tax is paid to the government; no income is declared to the government, so that they are not officially part of the GDP; there is no legal job security; there is no UIF (unemployment insurance fund); there is no medical aid for workers; there is no pension provision for workers; there is no protection against being paid below the legal minimum wage; there are more females employed in the informal sector than males in South Africa
2. It can expand or contract quickly in response to the changes in the economy; businesses outsource to people in the informal sector because they are cheaper; there is a gap for informal sector jobs; there are no restrictions or barriers to entry into the informal sector.
3. Examples:
  - Social challenges: Women predominate in this sector; no work security; xenophobia against foreigners in the informal sector
  - Political challenges: Create regulations that do not inhibit the employment in the informal sector; uncollected tax from the informal sector; stimulate more employment opportunities in the informal sector
  - Economic challenges: Low salaries and wages; difficulty in raising loans to expand the business; lack of business and management skills by entrepreneurs

Learner's Book  
pages 366–372  
Duration: 3 hours

**UNIT 6**

**Geographical skills and techniques**

TERM 4, WEEK 4

The focus of this unit is on systematically revising the work associated with geographical skills and techniques which learners have covered in Grade 12, in preparation for the final end-of-year examination.

**Curriculum and Assessment Policy (CAPS) content**

**Mapwork techniques**

- Consolidation of map skills from Grades 10, 11 and 12
- Reading and interpreting synoptic weather maps, satellite images and other weather- and climate-related data.
- Map and photo interpretation – includes reading and analysis of physical and constructed features
- Applying map-reading skills to maps and photos

### **Topographic maps**

- Contours and landforms
- Cross sections
- Direction: magnetic north, true north and magnetic declination
- Gradient
- Intervisibility
- Grid referencing

### **Aerial photographs and orthophoto maps**

- Interpreting vertical aerial photos
- Orthophoto maps – identifying features
- Comparing an orthophoto map with a topographic map

### **Geographical Information Systems (GISs)**

- GIS concepts: remote-sensing and resolution
- Spatial and attribute data; vector and raster data
- Data standardisation, data sharing and data security
- Data manipulation: data integration, buffering, querying and statistical analysis
- Application of GIS by Government and the private sector, related to all topics in Grade 12
- Develop a ‘paper GIS’ from existing maps, photos or other records on layers of tracing paper

### **Using atlases (revision)**

- Examining thematic maps
- Comparing information from different maps

### **Key geographical skills and techniques**

- reading and interpreting information with regard to climatology and geomorphology from topographic maps, orthophoto maps, satellite images and synoptic charts
- reading GIS maps, and constructing and interpreting simple GIS outputs
- practising field observation and mapping
- applying communication, thinking, practical and interpretive skills
- processing, interpreting, and evaluating data
- working co-operatively and independently

### **Resources**

Learner’s Book pages 366–372

### **Preparation**

- Read through the unit to familiarise yourself with the content. If you need to return to the theory, refer to previous modules.
- Refer to Grades 10 and 11 where learners have received a background in geographical skills and techniques, on which this unit builds.

## Teaching the unit

- Start by asking learners what sections they have covered under geographical skills and techniques. Ask them what they have learnt about mapwork skills; topographic maps; aerial photographs and orthophoto maps; Geographical Information Systems (GISs); and using atlases.
- Go through the text on pages 366 and 367 in the Learner's Book with learners.

## Answers

### Activity 1 (Learner's Book, page 368)

- a. George Rex Slipway:  $34^{\circ}00'30''\text{S}$  and  $23^{\circ}00'45''\text{E}$
  - b. Knysna Prison:  $34^{\circ}01'40''\text{S}$  and  $23^{\circ}02'40''\text{E}$
  - c. Castle Rock:  $34^{\circ}04'40''\text{S}$  and  $23^{\circ}01'15''\text{E}$
  - d. The centre of Leisure Isle:  $34^{\circ}04'10''\text{S}$  and  $23^{\circ}03'30''\text{E}$
- a. 5,2 km. (A quick method for use on any map with a scale of 1:50 000: Measure the distance between the two points with a ruler in centimetres. Then divide by 2, and you have an instant answer in kilometers.)
  - b. 18 km. (Use a piece of string to measure distances along the roads. Use a ruler and the method above to measure the length of the string. Add the subtotals for an answer.)
3. Knysna Lagoon (estuary) and the Knysna Heads
- a. • Measure the horizontal distance with a ruler, and use the method above to get a real distance.
  - Measure the vertical distance by reading the contours.
  - Divide the vertical distance by itself, to cancel it down to 1.
  - Divide the horizontal distance by the vertical (what is done to one side of the equation is now done to the other) and you will end up with a ratio of 1:16 which is the mean gradient, rounded off.
5. Draw a cross-section between the two points (A and D) joined by a red dotted line on the map. Use a vertical scale of 0,5 cm to 20 m for the cross-section. Learners compare their cross-sections to find out which one is correct.
  - a. Vertical scale is 0,5 cm to 20 m which is 1 cm to 40 m  
Horizontal scale is 1:50 000 which is 1 cm to 500 m  
Divide 500 by 40 = 12,5  
The vertical scale is 12,5 times greater (exaggeration) than the horizontal scale. (We do this so that the vertical component or relief, will 'stand out' better.)
  - b. yes
  - c. no

### Examination preparation:

For information on how to assess the learners' answers, please see page 245 in the Formal Assessment section of this Teacher's Guide.

### Activity 2 (Learner's Book, page 368)

1. A = The Heads (Eastern Head)  
B = Leisure Isle  
C = The Heads (Western Head)  
D = Knysna Lagoon
2. from Westhill, because a view from the other two points would not give this perspective
3. The numerous sand banks, and also Thesen Island and Leisure Isle, which are built up from sand deposited in the lagoon.
4. Caravan Park (Woodbourne), Leisure Isle, Featherbed Nature Reserve, Caravan Park and Camping Site, Simola Golf Course

**(Trial)/  
Examination  
(Paper 1 and  
Paper 2):**

For information on how to assess the learners' answers, please see page 209 in the Formal Assessment section of this Teacher's Guide.

5. fishing; golf; boating; swimming; hiking; visiting nature reserves
6. the names of the settlements, such as Xolweni, Rhobololo and Ethembeni
7.
  - a. yes, names such as Concordia Forest and the symbol for trees and forest
  - b. A = indigenous forest; B = exotic wattle trees
  - c. A (indigenous forest) would occur in a nature reserve, as it is protected, natural vegetation, which now only occurs in isolated patches, and must be preserved because of its biodiversity. B (exotic trees) are planted in plantations, and are felled for commercial use after about 10 years.

### 3. FORMAL ASSESSMENT

1. Assessment in Geography in Grade 12	170
2. Programme of assessment	170
3. Formal assessment: tasks, tests and examinations	171
4. Photocopiable assessment resources	252
5. Recording and reporting	252



## 1. ASSESSMENT IN GEOGRAPHY IN GRADE 12

Assessment in Grade 12 is made up of:

- informal or daily assessment
- formal assessment.

In *Study & Master Geography Grade 12*:

- informal assessment advice is given as part of the lesson guidance in the Lesson-by-lesson section (pages 19–168) of this Teacher’s Guide
- formal assessment guidance and assessment tools are provided below.

## 2. PROGRAMME OF ASSESSMENT

The programme of assessment provided in *Study & Master Geography Grade 12* is in line with the Curriculum and Assessment Policy Statement for Geography and thus spreads out the formal assessment tasks throughout the year. The assessment programme is made up of three tasks, two tests and two examinations. For promotion purposes, a year mark is added to the end-of-year examination mark. The year mark is made up of marks obtained in the tasks, tests and mid-year examination. This is reflected in the table below.

Term	Week	Type of formal assessment	Content and skills focus of assessment	Learner’s Book and Teacher’s Guide page reference	Total number of marks	Contribution to year mark
Term 1	9	Assessment Task 1	Climate and weather; and Geomorphology	Learner’s Book pp. 151–152; Teacher’s Guide pp. 171–172	40 marks	20 marks
Term 1	10	Test 1	Climate and weather; and Geomorphology	Teacher’s Guide pp. 173–175	20 marks	10 marks
Term 2	9	Assessment Task 2	Settlement geography (rural and urban settlements)	Learner’s Book pp. 259–261; Teacher’s Guide p. 177	70 marks	20 marks
Term 2	10	Mid-year examination	Work covered in Terms 1 and 2	Teacher’s Guide pp. 179–187 (Paper 1) and 188–194 (Paper 2)	300 marks	20 marks
Term 3	9	Assessment Task 3	Economic geography of South Africa	Learner’s Book pp. 337–338; Teacher’s Guide p. 202	60 marks	20 marks
Term 3	10	Test 2	Economic geography of South Africa	Teacher’s Guide pp. 204–206	20 marks	10 marks
Term 4	5–6	Trial examination	Work covered throughout year	Teacher’s Guide pp. 209–229 (Paper 1) and 230–235 (Paper 2)	300 marks	300 marks

For more information on formal assessment, see Section 4 of the CAPS document.

## 3. FORMAL ASSESSMENT: TASKS, TESTS AND EXAMINATIONS

Learner's Book  
pages 151–152

### Assessment Task 1

TERM 1, WEEK 9

**Geography topics:** Climate and weather; Geomorphology; Geographical skills and techniques

#### Resources

Learner's Book pages 151–152

#### Background

- This task focuses on Term 1 of *Study & Master Geography* Grade 12 and therefore should be scheduled for after the learners have completed Modules 1–3. (See Year Plan on pages 6–17).
- The skills covered in this task are data handling – analysing and synthesising information and working with a variety of data.
- Allow some class time in Week 8 to go through the task with learners. Set the task as homework for the learners.
- The task in the Learner's Book is out of 40 marks. You will need to convert this to a mark out of 20 for contribution of this assessment to the year mark. (See Recording and reporting, on page 252.)

#### Preparing the learners

- Remind the learners that they should work on their own and answer all questions.
- Let them read through the task and ask questions about any part of it that they do not understand.
- Remind them that they can consult Modules 1–3 in the Learner's Book if they need to.
- Give them a due date for the completed task.

#### The task

You will find Assessment Task 1 on pages 151–152 of the Learner's Book. A marking memorandum is supplied on page 172 under the heading, 'Assessment guidance'.



**Activity 1**

1. Any one: date is August; mid-latitude cyclone approaching; minimum temperatures over the interior are low (1)
2. a. A = South Atlantic High; B = South Indian High; C = coastal low; D = cold front; E = occluded front (5 × 1)
- b. i. north along the coast/up the east coast (1)
- ii. eastwards/west to east (1)
3. The Kalahari High (not shown) here dominates the interior in winter. (1)
4. Any 6 marks out of 7 (6 × 1)



5. a. 1 = northwest, 20 knots; 2 = west, 20 knots (2 × 2)
- b. backing (1)

[20]

**Activity 2**

1. a. high, low (2 × 1)
- b. high, low (2 × 1)
- c. silty-clay, porous sandy (2 × 1)
- d. dendritic (1)
- e. bigger (1)
2. a. stream density for A = 3,5 – 3,75 km per km<sup>2</sup> (accept any answer in this range) (4)
- b. stream density for B = 1,25 – 1,5 km per km<sup>2</sup> (accept any answer in this range) (4)

To calculate:

Stream density (or drainage density) = total stream length in square ÷ area ✓

Area = 1 km × 1 km = 1 km<sup>2</sup> ✓

Total stream length = total length of cotton for all streams ÷ length of 1 km scale ✓

(It works best using a piece of cotton so that you automatically add up all the stream lengths, rather than having to add by calculation)

If answer is wrong, assign 1 mark according to each tick, for both A and B

3. S = 1; T = 1; U = 2; V = 1 (4 × 1)

[20]

**Total: 40 marks**

Divide by two for a final mark out of 20

**Geography topics:** Climate and weather; Geomorphology

### **Resources**

Photocopies of the test in this Teacher's Guide (pages 174–175)

### **Background**

- The test focuses on material covered in Term 1 and the questions require lower-order, middle-order and higher-order thinking skills from the learners.
- The test is out of 20 marks. You will need to convert this to a mark out of 10 for contribution of this assessment to the year mark.

### **Preparing the learners**

- At the beginning of Term 1, spend some time discussing what material learners will need to cover for the test.
- In week 4 or 5 of Term 1, spend some time discussing the format of the test, including how much time learners will be given to complete it (1 hour).
- Remind the learners that they will need to revise all the work covered in Modules 1 and 2.
- Explain that the way the test is structured means that they will not be able to leave out any sections of work as they prepare for it.

### **Test 1**

You will find a test that you can use for Test 1 on pages 174–175 of this Teacher's Guide. You may photocopy this test. Alternatively, design your own test.

### **Assessment guidance**

You will find a memorandum for Test 1 on page 176 of this Teacher's Guide. You may photocopy this memorandum if you wish to.

**Question 1**

A 1995 study compared temperature data for five very large cities and 19 stations from non-urban locations in South Africa for the period 1960–1990.

The results are summarised as follows:

	Non-urban	Urban
Maximum temperature increase per decade	0,11	0,12
Minimum temperature per decade	0,07	0,34

1. Identify one of the cities on the map in Figure 1.1 below. (1)
2. Is this temperature difference related to global warming or urban growth? Give a reason for your answer. (2 × 1)
3. Name the phenomenon illustrated in the table. (1)
4. Explain why the effect is noticeable for the minimum temperatures. (2 × 1)
5. Is the intensity of the effect greater in summer or winter? (1)
6. List two factors that contribute to this effect. (2 × 1)
7. Give one step that can be taken to reduce this effect in established cities. (1)

[10]

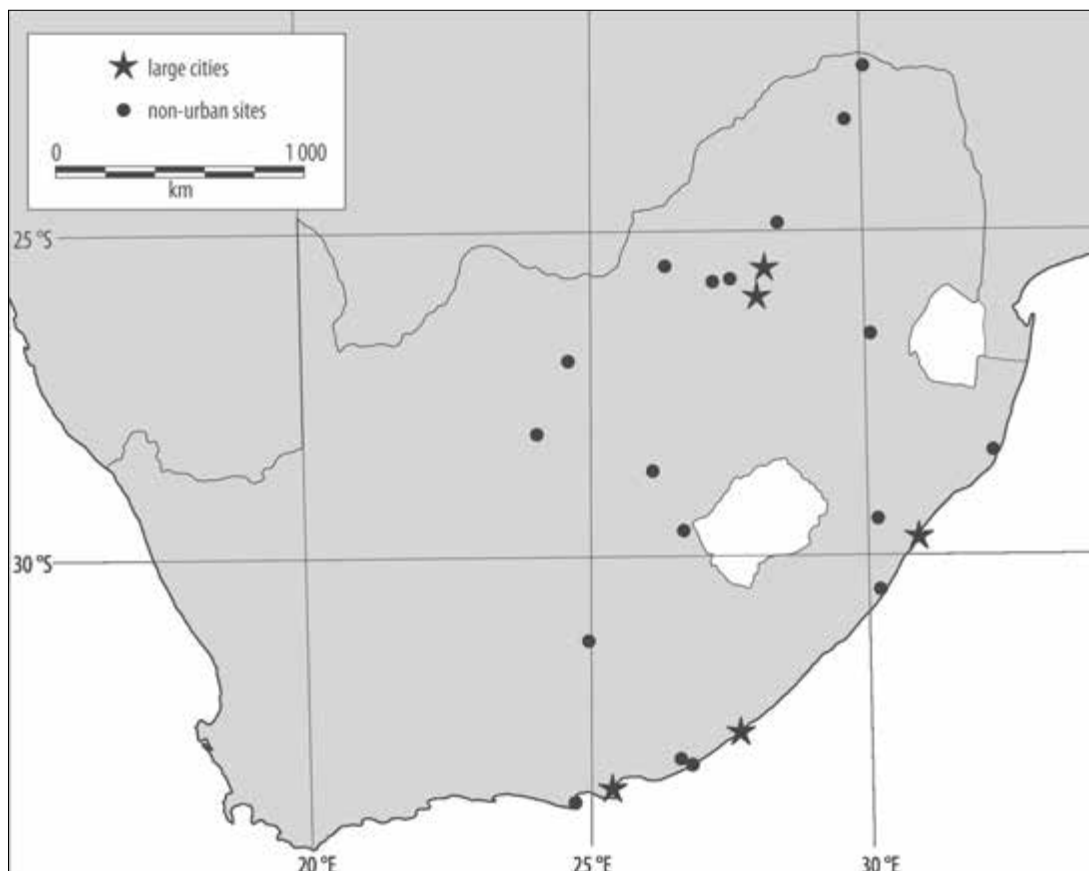


Figure 1.1 Map of South Africa

**Question 2**

1. Identify the drainage basin with the high drainage density (fine texture) in Figure 1.2A. (1)
2. Define drainage density. (1)
3. Give one factor that contributes to high drainage density. (1)
4. Match drainage basins A and B to their hydrographs in Figure 1.2B. (2 × 1)

[5]

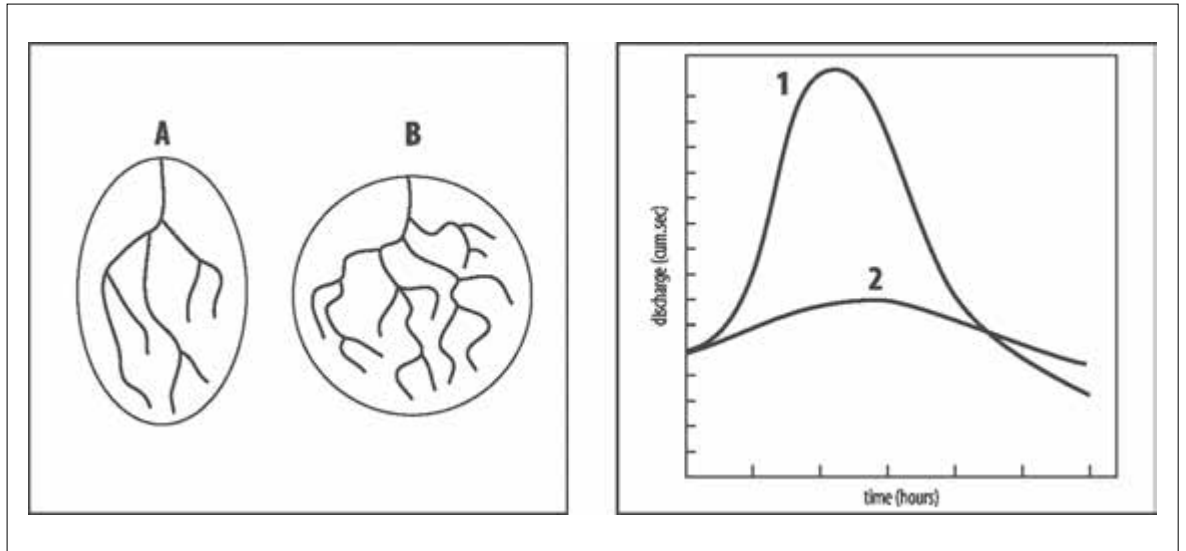


Figure 1.2A Drainage basin

Figure 1.2B Hydrograph

**Question 3**

Identify these features of river capture in the diagram: elbow of capture, misfit stream, captor stream, watershed, wind gap. (5 × 1)

[5]

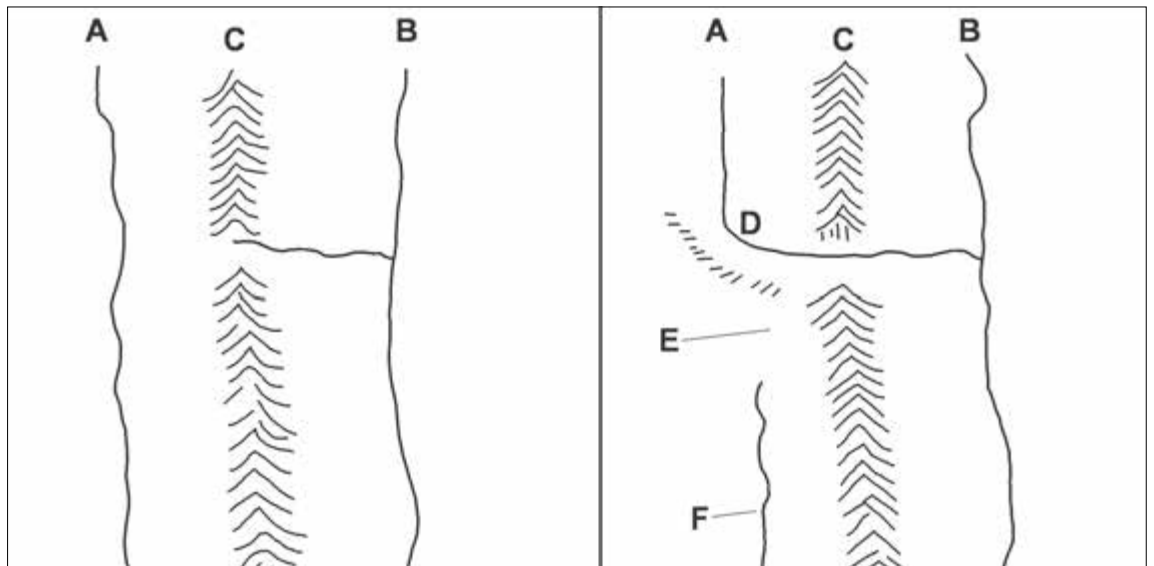


Figure 1.3 River capture

**Total: 20**

**Question 1**

1. Any one: Port Elizabeth, East London, Durban, Johannesburg, Vereeniging/Pretoria (either answer acceptable) (1)
2. urban growth; it is specific to cities, not a general warming ( $2 \times 1$ )
3. urban heat island effect (1)
4. Heat that builds up during the day is held or trapped at night by tall buildings, heat-absorbing surfaces or a pollution dome. ( $2 \times 1$ )
5. winter (1)
6. Any two: change in land cover (surfaces such as tar, brick and concrete that absorb heat); heat generated from human activities (such as the burning of fuels for manufacturing, electricity generation and transport); pollution traps heat ( $2 \times 1$ )
7. Any one: greening/ planting trees; introducing water bodies (lakes) to absorb heat; careful choice of building materials and surfacing materials to reduce amount of heat trapped (1)

[10]

**Question 2**

1. B (1)
2. total river or stream length relative to area drained (1)
3. Any one: high surface run-off (because of impermeable rock, clay-like soil or steep gradient); high rainfall/heavy rains; low levels of evaporation; moist soil (1)
4. A = 2; B = 1 ( $2 \times 1$ )

[5]

**Question 3**

B = captor stream; C = watershed; D = elbow of capture;  
E = wind gap; F = misfit stream ( $5 \times 1$ )

[5]

**Total: 20**

**Geography topics:** Rural settlements; Urban settlements; Geographical skills and techniques

### Resources

Learner's Book pages 259–261

### Background

- This task focuses on Term 2 of *Study & Master Geography* Grade 12 and therefore should be scheduled for after the learners have completed Modules 4–6. (See Year Plan on pages 6–17).
- The skills covered in this task are analysing and synthesising information and working with a variety of information on settlement geography.
- Allow some class time in Week 8 to go through the task with learners. Set the task as homework for the learners.
- The task in the Learner's Book is out of 70 marks. You will need to convert this to a mark out of 20 for contribution of this assessment to the year mark. (See Recording and reporting, on page 252.)

### Preparing the learners

- Remind the learners that they should work on their own and answer all questions.
- Let them read through the task and ask questions about any part of it that they do not understand.
- Remind them that they can consult Modules 4–6 in the Learner's Book if they need to.
- Give them a due date for the completed task.

### The task

You will find Assessment Task 2 on pages 259–261 of the Learner's Book. A marking memorandum is supplied on page 178 under the heading, 'Assessment guidance'.

**Question 1**

1.1 D; 1.2 B; 1.3 C; 1.4 A; 1.5 C

[5]

**Question 2**

2.1 F; 2.2 A; 2.3 B; 2.4 G; 2.5 E

[5]

**Question 3**

- 3.1 wet point site; dry point site; relief; resources and building materials; fuel supplies; bridging points; soils; defence; nodal point; gap site; aspect; break-of-bulk point (any TWO) (2)
- 3.2 in undeveloped countryside; associated with isolated farms, mining, fishing, hamlets or market villages; low-rise buildings; primary economic activities; fewer people; sparse population; limited facilities; fewer services; limited job opportunities; poor infrastructure; older population; lower property prices (any TWO) (2)
- 3.3 developed area; associated with towns, cities, metropolises; high-rise structures; secondary, tertiary and quaternary economic activities; large population; dense population; many facilities; many services; variety of job opportunities; well-developed infrastructure; economically active age range (any TWO) (2)
- 3.4 push and pull factors (any of them, or just these two terms) (2)
- 3.5 families left behind; women left behind to tend fields and raise children; decline in food security in rural area; breakdown of social life; strain on service delivery in the cities, e.g. housing, electricity, water, schooling; informal settlements expand/unemployment (any TWO) (2)

[10]

**Question 4**

- 4.1 the creation of the homelands or bantustans; apartheid and racial segregation laws such as the Group Areas Act/forced removal from the land (2)
- 4.2 to resolve claims and restore land rights; to award alternative forms of equitable settlement to communities, people, or descendants of people who had lost land (2)
- 4.3 Resources and land represent money and power. Allocation of resources and land is seen as a political instrument. (2)
- 4.4 Zimbabwe; Ethiopia (any ONE) (2)
- 4.5 The validity of the claim, boundary disputes, the death or disappearance of claimants, all create difficulties for the Commission. (2)

[10]

**Question 5**

Learner's own answers.

[40]

**Total: 70 marks**

Convert for a final mark out of 20

**INSTRUCTIONS AND INFORMATION**

This question paper consists of THREE questions.

Answer ALL the questions, which are worth 75 marks each.

**Question 1**

1.1 Choose the description from Column B that matches the term in Column A. Write only the letter next to the question number.

Column A		Column B	
1.1.1	warm front	A.	the lowering of the watershed by erosion
1.1.2	polar front	B.	a boundary between the cold polar easterlies and the warm mid-latitude westerlies
1.1.3	storm surge	C.	the lowering of a watershed by erosion until the slope is the same on both sides
1.1.4	Kalahari anticyclone	D.	a form of erosion in which minerals are broken down by chemical reaction
1.1.5	line thunderstorm	E.	the course of a river is older than the structures of the landscape it flows through
1.1.6	urban heat island	F.	a temperature inversion layer
1.1.7	abstraction	G.	the warm sector of air in a mid-latitude cyclone
1.1.8	headward erosion	H.	the erosion of a river towards its source
1.1.9	antecedent drainage	I.	rainfall caused by a trough of low pressure over the plateau
1.1.10	abstraction	J.	a rise in sea level caused by wind-driven waves
		K.	a city area that is warmer than a neighbouring suburban or rural area
		L.	a high-pressure cell over the interior of southern Africa in winter

(10 × 1)

[10]



- 1.2 Choose the correct phrase in brackets.
- 1.2.1 The direction of wind in a Ferrel cell is (easterly/westerly).
  - 1.2.2 The change in wind direction as a cold front passes over the Western Cape is called (veering/backing).
  - 1.2.3 The weather systems that can cause flooding in Mozambique are called (tropical/mid-latitude) cyclones.
  - 1.2.4 The cold air that follows a cold front is dense and has (low/high) relative humidity.
  - 1.2.5 The valley winds that blow (up/down) the slope are called anabatic winds.

(5 × 1)

[5]

- 1.3 Study Figure 1.1, which is a synoptic weather map. Then answer these questions.

- 1.3.1 Which season is depicted in this map? Give a reason for your answer. (2 × 2) (4)
- 1.3.2 Identify high-pressure cells A and B. (2 × 2) (4)
- 1.3.3 Name the high-pressure cell that is typically found over the interior in this season, and describe how it affects the climate in South Africa in this season. (2 × 3) (6)
- 1.3.4 Identify the low-pressure cell marked as C, and give the characteristic shown on this map. (2 × 2) (4)
- 1.3.5 Describe how pressure cell B forms. (3 × 2) (6)
- 1.3.6 In which direction does the wind spiral into pressure cell B? (1 × 2) (2)
- 1.3.7 Describe how the wind direction changes as pressure cell B passes over Cape Town. (2 × 2) (4)

[30]

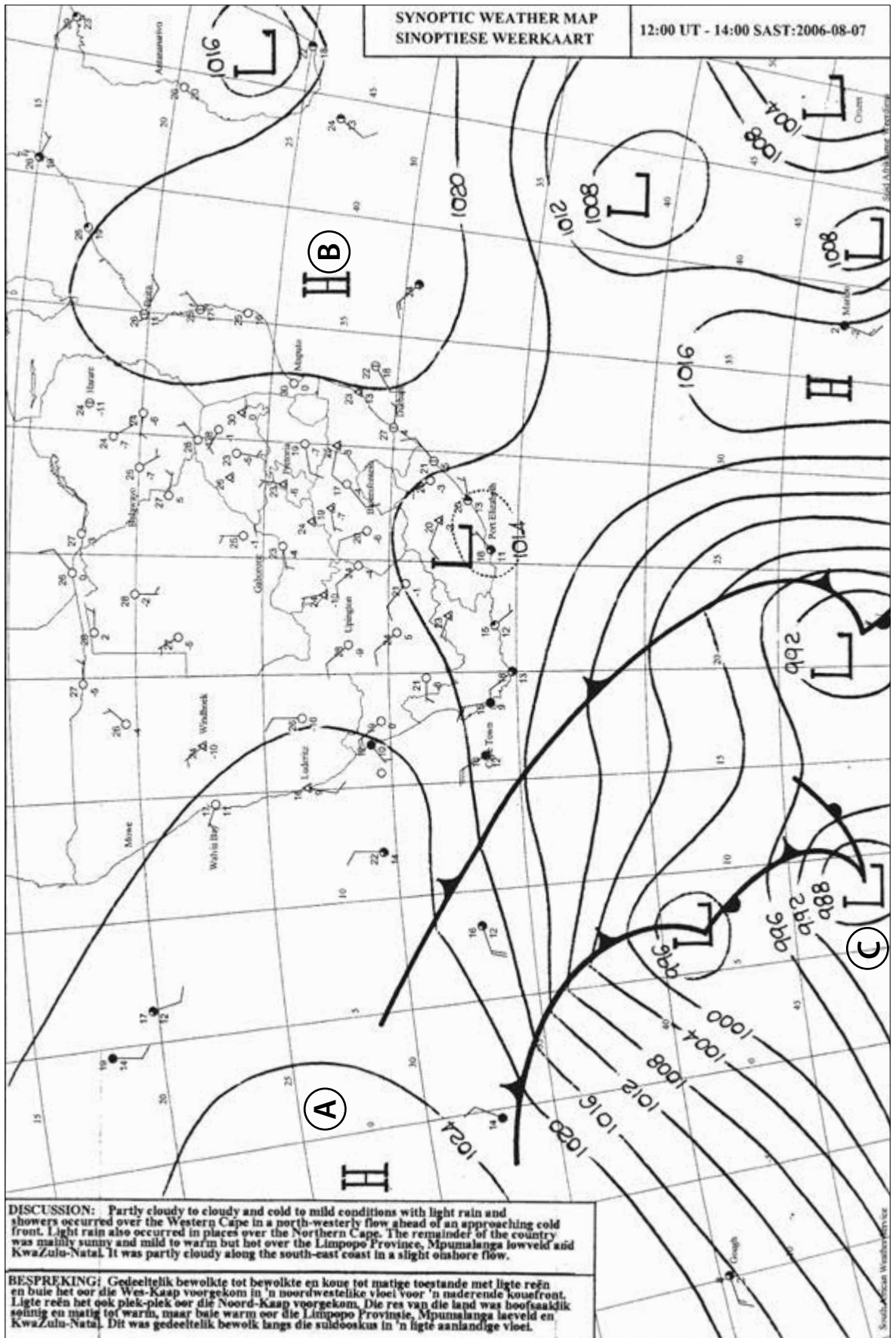


Figure 1.1 Synoptic weather map

1.4 The Thukela River has its source on the eastern side of the Drakensberg and flows through KwaZulu-Natal. A longitudinal profile of the river is shown in Figure 1.2.

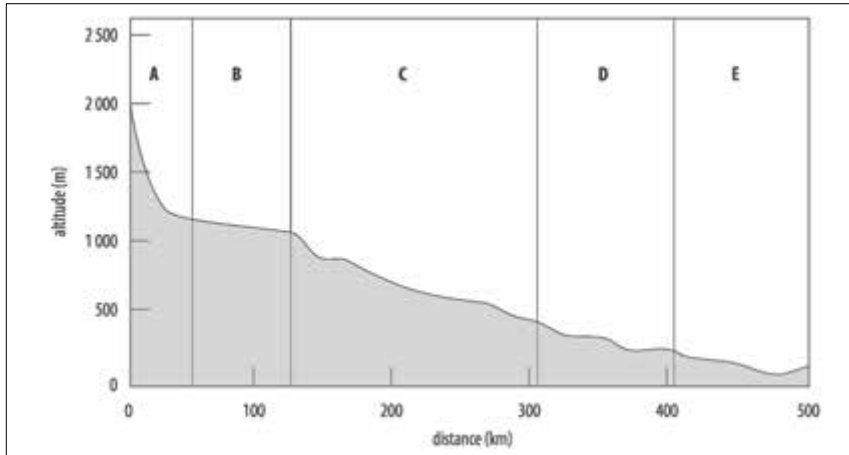


Figure 1.2 Longitudinal profile of the Thukela River

- 1.4.1 From the sections labelled A–E in the river profile, identify the following:
- (a) the Thukela Falls, which plunges 900 metres and is the second highest waterfall in the world (1 × 2) (2)
  - (b) the rejuvenated part of the river (1 × 2) (2)
  - (c) a part of the river that has a meandering pattern (1 × 2) (2)
  - (d) a part of the river in which the water flow is turbulent (1 × 2) (2)
- 1.4.2 Define the term ‘rejuvenation’. (1 × 2) (2)
- 1.4.3 Identify a landform associated with rejuvenation. (1 × 2) (2)
- 1.4.4 Describe the cross-profile of the meandering part of the river. (2 × 2) (4)
- [16]

1.5 Refer to Figure 1.3 and complete the questions that follow.

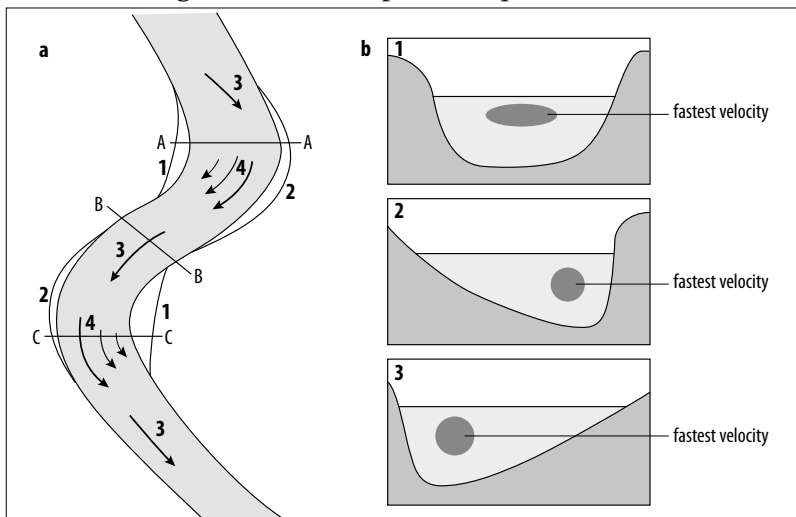


Figure 1.3

- 1.5.1 Identify the river pattern shown in a. (2)
- 1.5.2 Which part of the river course is shown in a? Give a reason for your answer. (3)
- 1.5.3 Identify on (a) the labelled parts where
- (a) erosion takes place (1)
  - (b) deposition takes place (1)

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- 1.5.4 Identify from the labelled arrows (3 and 4) where the river flows fastest. Give a reason for your choice. (4)
- 1.5.5 Match the labelled sections of the river A–A, B–B, C–C to the cross profiles 1, 2 and 3 shown in (b). (3)
- [14]
- [75]

## Question 2

2.1 For each statement below, select the correct term in brackets.

Write only the question number and the correct term.

- 2.1.1 Winds that blow in the mid-latitudes are (berg winds/ westerlies).
- 2.1.2 A(n) (occluded front/ cold front) forms when a warm sector of air overtakes a cold sector.
- 2.1.3 A tropical cyclone that forms in the Atlantic Ocean is called a (hurricane/ typhoon).
- 2.1.4 The Earth is warmed by the Sun by the process of (insolation/ terrestrial radiation).
- 2.1.5 The bubbling flow of water in a river is called (laminar flow/ turbulent flow).
- 2.1.6 A stream in which there is more deposition than erosion is (overgraded/ undergraded).
- 2.1.7 The (floodplain/ pediplain) is the wide, flat part of a valley over which a river spreads in times of flood.
- 2.1.8 The pointed, dolomite capped hills of the Karoo are called (mesas/ buttes).
- 2.1.9 When a high-pressure cell pushes into a region of lower pressure, it elongates or lengthens to form a (ridge/ trough).
- 2.1.10 Frost forms if the (radiation fog/ dew point) is below  $0^{\circ}\text{C}$ . ( $10 \times 1$ )
- [10]

2.2 The statements below describe how an anticyclone forms.

Select the correct option (underlined) for each statement.

- 2.2.1 Dry, cool air rises/ descends.
- 2.2.2 Pressure increases/ decreases.
- 2.2.3 Air warms/ cools.
- 2.2.4 Winds spiral clockwise/ anticlockwise.
- 2.2.5 The winds spiral into/ out of the pressure cell. ( $5 \times 1$ )
- [5]

2.3 Study Figure 2.1 below, which shows an oblique view of the Kalahari. Then answer the questions that follow.

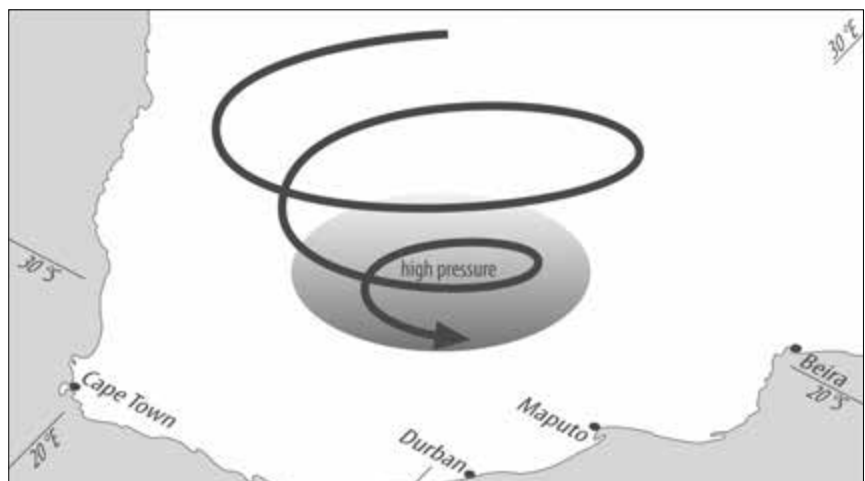


Figure 2.1 Oblique view of Kalahari

- 2.3.1 Sketch an isobar diagram of the Kalahari High shown in Figure 2.2. Include:
- the symbol for a high-pressure cell in the centre
  - arrows to show wind directions. (8)
- 2.3.2 Explain why air warms as it descends. (6)
- 2.3.3 Name the two other anticyclones that influence South Africa's weather. (4)
- 2.3.4 Suggest why these large high-pressure cells are also called anticyclones. (2)
- [20]

2.4 Refer to the table below, which shows differences between the minimum temperatures in central Nairobi and an outlying area (the airport), and answer the questions that follow.

Month	Difference between minimum temperatures
January	2,1 °C
July	0,8 °C

Table 1.1 Difference between minimum temperatures in central Nairobi and an outlying area

- 2.4.1 Name the phenomenon or effect that is shown here. (1 × 2) (2)
- 2.4.2 At what time of the day is this temperature difference greatest? (1 × 2) (2)
- 2.4.3 Would the temperature difference be greater during the week or weekdays? Give a reason for your answer. (2 × 2) (4)
- 2.4.4 Suggest one way in which a city can be designed to reduce this effect. (1 × 2) (2)
- [10]

2.5 Give the names of the drainage patterns in a–e of Figure 2.2.

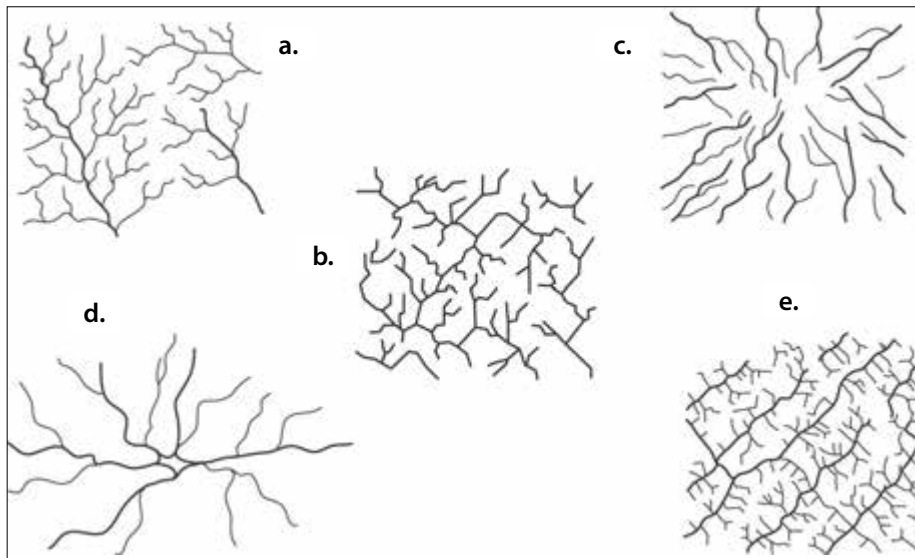


Figure 2.2 Drainage patterns (5 × 2) [10]

2.6 Figure 2.3 shows a simple map of the Doring River, which is a tributary of the Olifants River. The Nieuwoudt Falls were formed by the capture of a river that used to flow towards the interior.

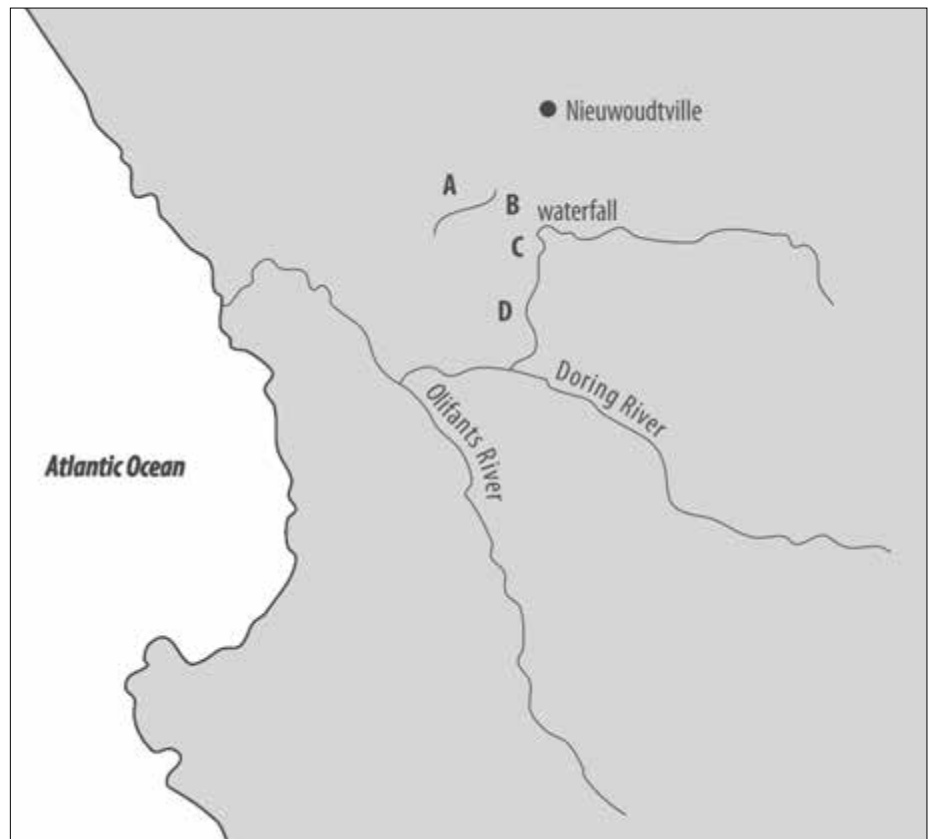


Figure 2.3 The Doring River

- |  |             |
|--|-------------|
| 2.6.1 Define the term 'river capture'.                               | (1 × 2) (2) |
| 2.6.2 Explain why this waterfall is a feature of river capture.      | (2 × 2) (4) |
| 2.6.3 Identify the features of river capture labeled A–D on the map. | (4 × 2) (8) |
| 2.6.4 Describe the grade of the captured river.                      | (1 × 2) (2) |
| 2.6.5 Explain why rejuvenation is associated with river capture.     | (2 × 2) (4) |
|  | [20]        |
|  | [75]        |

### Question 3

- 3.1 Indicate whether the following statements are TRUE or FALSE.
- 3.1.1 Every function has its own threshold and range.
  - 3.1.2 The CBD is known as the heated dome because the tall buildings in the CBD release heat.
  - 3.1.3 A square grid is a grid system with the grid lines numbered sequentially from the origin at the bottom left of the map.
  - 3.1.4 The urban profile is a side view of the city.
  - 3.1.5 The basic function of a rural settlement is to provide tertiary functions.
  - 3.1.6 Primary activities include the manufacturing of goods.
  - 3.1.7 South Africa has a dual agricultural economy because it consists of only crop farming.
  - 3.1.8 The three factors that influence economic activities are the social, economic and political systems in a country.

- 3.1.9 Food insecurity is when a country or individuals do not have enough food to sustain themselves.
- 3.1.10 An industrial zone is an area set aside for factories and warehouses.

(10 × 1) (10)  
[10]

3.2 Match the terms in Column A with their meaning in Column B.

Column A		Column B	
3.2.1	Gross Domestic Product	A.	A metropolitan area formed by two merging cities
3.2.2	urban hierarchy	B.	The difference in monetary value between the exports and imports of a country
3.2.3	balance of trade	C.	A country's international transactions by measuring the imports and exports of a country's goods
3.2.4	conurbation	D.	The total value of all goods and services produced in a country in a year
3.2.5	trade	E.	The ranking of urban settlements according to their size and/or function

(5 × 1)  
[5]

3.3 Study Figure 3.1, which shows two rural settlement patterns. Then answer the questions that follow.

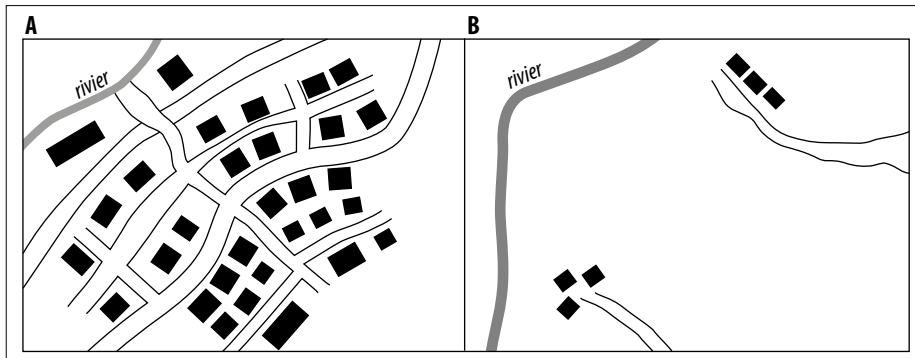


Figure 3.1 Rural settlement patterns

- 3.3.1 Provide three factors that determine the site of a settlement. (3 × 2) (6)
- 3.3.2 (a) Identify the rural settlement patterns marked A and B. (2 × 2) (4)
- (b) Provide one advantage of settlement A. (1 × 2) (2)
- (c) Provide two disadvantages of settlement B. (2 × 2) (4)
- 3.3.3 Differentiate between subsistence and commercial farming regarding their economic output. (2 × 2) (4)
- [20]

3.4 Match the terms below with the correct settlement pattern in Figure 3.2.

- 3.4.1 rounded settlement pattern
- 3.4.2 T-shaped settlement pattern
- 3.4.3 Y-shaped settlement pattern
- 3.4.4 linear settlement pattern
- 3.4.5 crossroads settlement pattern

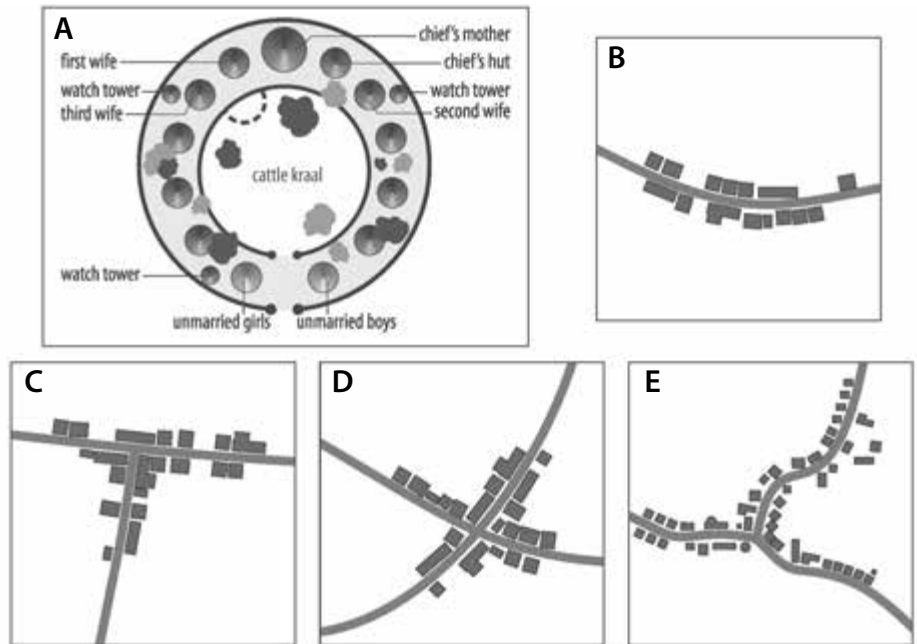


Figure 3.2 Settlement patterns

(5 × 2) (10)

[10]

3.5 Rural depopulation and urbanisation are linked. Consider these two processes and answer the questions that follow.

3.5.1 Explain what rural depopulation is. (1 × 2) (2)

(a) Provide two reasons why rural depopulation occurs. (2 × 2) (4)

(b) Name two negative impacts of rural depopulation. (2 × 2) (4)

3.5.2 Explain what urbanisation is. (1 × 2) (2)

(a) Give one difference between urbanisation in developed countries and urbanisation in developing countries. (1 × 2) (2)

(b) Provide two factors that pull people to the urban area. (2 × 2) (4)

[18]

3.6 Read the extract below and then answer the questions that follow.

### Exercise and pollution levels

Joggers and cyclists are advised to avoid exercising in rush hour because this is when air pollution is at its highest level. Exercise increases your breathing rate, so that you pull more air deeply into your lungs, and you tend to breathe through your mouth instead of your nose, which filters air as you breathe. Long-term exposure to pollutants may increase the risk of lung damage, lowered immunity, heart disease, cancer and neurological problems.

Source: Adapted from an article by Olivia Rose-Innes on Health24 ([www.health24.com/medical](http://www.health24.com/medical))

3.6.1 What problem that causes air pollution in the CBD does this article focus on? (1 × 2) (2)

3.6.2 During which times of the day is rush hour? (1 × 2) (2)

3.6.3 What is the reason for this problem in the CBD? (1 × 2) (2)

3.6.4 Suggest three possible solutions to the problem. (3 × 2) (6)

[12]

[75]

**Paper 1 total: 225 marks**



### RESOURCES

1. An extract from the topographic map 3422AB George (at the beginning of this paper)
2. A non-programmable calculator may be used.

### INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions in the spaces provided on this question paper. Together they are worth 75 marks.
2. You are supplied with a 1:50 000 topographic map, 3422AB George.
3. The following English terms and their Afrikaans translations are shown on the 1:50 000 topographical map:

ENGLISH	AFRIKAANS
Aerodrome	Vliegveld
Canal	Kanaal
Cango Caves	Kangogrotte
Cemetery	Begrafploas
College	Kollege
Crocodile Ranch	Krokodilploas
Factory	Fabriek
Furrow	Voor
Game Park	Wildpark
Golf Course	Golfbaan
Ostrich Abattoirs	Volstruislagpale
Ostrich Farm	Volstruisploas
Rifle Range	Skietbaan
Sewage Disposal Works	Rioolslykwerke
Showgrounds	Skougronde
Tourist Camp	Toeristekamp
Weir	Dwarswal



© You may photocopy this page for use with *Study & Master Geography Grade 12*.

### Question 1

Study the 1:50 000 topographic map 3422AB of George. Then circle the most appropriate answer.

- 1.1 George is a:
- A. city
  - B. residential area
  - C. town
  - D. farm area
- 1.2 The direction from Camphers Drift to George is:
- A. south-east
  - B. south
  - C. south-west
  - D. north
- 1.3 The direction from George Industria to Pacaltsdorp Industria is:
- A. north-east
  - B. south-west
  - C. east
  - D. south-east
- 1.4 The landform in the vicinity of A is a:
- A. gorge
  - B. saddle
  - C. valley
  - D. spur
- 1.5 The trig. beacon at B is \_\_\_\_\_ above sea level.
- A. 122 m
  - B. 401,8 m
  - C. 191,3 m
  - D. 308 m
- 1.6 The Gwaing River is an example of a \_\_\_\_\_ river.
- A. perennial
  - B. non-perennial
  - C. periodic
  - D. episodic
- 1.7 The land along the N9 is descending in a \_\_\_\_\_ direction.
- A. north-west to south-east
  - B. south to north
  - C. north-east to north-west
  - D. south-west
- 1.8 The two main factors favouring the site and situation of the George Aerodrome are the:
- A. rocky and sandy area
  - B. large and flat area
  - C. high-lying and mountainous area
  - D. railway line and main road

- 1.9 Farms in the area ensure that there is sufficient water for irrigation by building:
- A. reservoirs
  - B. canals
  - C. windmills
  - D. furrows

- 1.10 What type of rainfall does the mapped area receive?
- A. periodic
  - B. throughout the year
  - C. seasonal
  - D. sporadic

(10 × 1½)  
[15]

**Question 2**

- 2.1 Calculate the approximate distance along the N9 from Knysna 53 km to Levallia residential area. Show all calculations. Express your answer in kilometres.

---

---

---

(4 × 2) (8)

- 2.2 Determine the grid reference of Pacaltsdorp Industria.

---

---

---

(2 × 2) (4)

- 2.3 Determine the true bearing from Thembalathu to Pacaltsdorp.

---

---

---

(2 × 2) (4)

- 2.4 Now determine the back bearing from Thembalathu to Pacaltsdorp.

---

---

---

(2 × 2) (4)  
[20]

**Question 3**

3.1 In which direction is the Gwaing River flowing? Provide a reason for your answer.

---

---

---

(2 × 2) (4)

3.2 Name the slope type found at George. Comment on how the relief (topography) of the area has influenced the situation of the CBD.

---

---

---

(1 × 1) (2 × 2) (5)

3.3 Name the primary activities that take place in the George area.

---

---

---

(2 × 1) (2)

3.4 Name one secondary activity in this area.

---

---

---

(2 × 1) (2)

3.5 Explain the reason for the location of George Industria.

---

---

---

(1 × 2) (2)

3.6 Name two types of transport services provided to the residents of George.

---

---

---

(2 × 2) (4)

3.7 Name one tourist attraction in the George area.

---

---

---

(1 × 2) (2)

3.8 Name one disadvantage and one advantage of Buffelsfontein farm (south-west of George).

---

---

---

---

(2 × 2) (4)

[25]

**Question 4**

4.1 Define the following concepts:

4.1.1 Satellite remote-sensing

---

---

4.1.2 Satellite data

---

---

(2 × 2) (4)

4.2 State any two ways in which geographical information can be obtained.

---

---

(2 × 2) (4)

4.3 Differentiate between spatial and attribute data.

---

---

(2 × 2) (4)

4.4 Name three attributes in the map overlay shown in Figure 4.1.

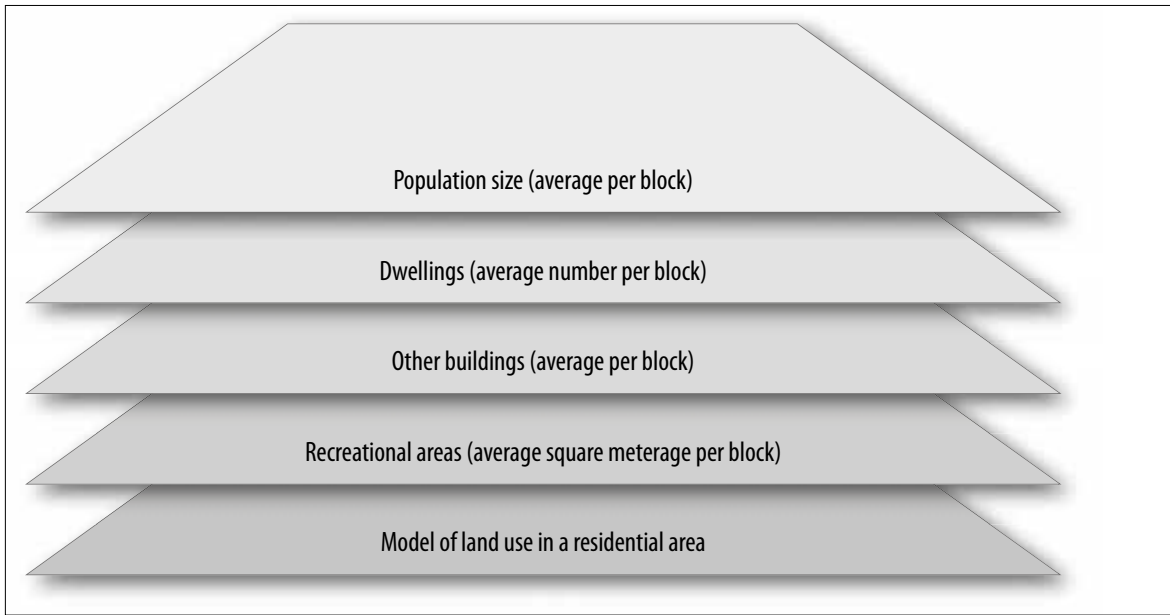


Figure 4.1 Map overlay

---

---

---

---

---

---

---

---

---

---

---

(3 × 1) (3)

[15]

**Paper 2 total: 75 marks**

**Question 1**

- 1.1.1 G
- 1.1.2 B
- 1.1.3 J
- 1.1.4 L
- 1.1.5 I
- 1.1.6 K
- 1.1.7 C
- 1.1.8 H
- 1.1.9 E
- 1.1.10 A (10 × 1)  
[10]
- 
- 1.2.1 westerly
- 1.2.2 backing
- 1.2.3 tropical
- 1.2.4 low
- 1.2.5 up (5 × 1)  
[5]
- 
- 1.3.1 Winter. Cold fronts are passing over the southern Cape. (2 × 2) (4)
- 1.3.2 A: South Atlantic anticyclone; B: South Indian anticyclone (2 × 2) (4)
- 1.3.3 Kalahari anticyclone. There are clear skies and dry conditions. (2 × 3) (6)
- 1.3.4 Cold front (mid-latitude cyclone). They usually occur in families of 3–5. (2 × 2) (4)
- 1.3.5 Warm, moist subtropical air meets cold dry subpolar air, forming a polar front. A depression forms in the polar front and winds blow into the low-pressure cell. (3 × 2) (6)
- 1.3.6 clockwise (1 × 2) (2)
- 1.3.7 It changes from north-west to south-west. This is called backing. (2 × 2) (4)  
[30]
- 
- 1.4.1 (a) A (1 × 2) (2)
- (b) C (1 × 2) (2)
- (c) D; or E (1 × 2) (2)
- (d) A; or B; or C (1 × 2) (2)
- 
- 1.4.2 The process by which a river gains more energy and vertical eroding power. (1 × 2) (2)
- 1.4.3 Any one of the following:
- knickpoint waterfall
  - paired terraces
  - valleys-within-valleys
  - incised meanders (1 × 2) (2)
- 1.4.4 It is wide, shallow and often asymmetrical. (2 × 2) (4)  
[16]



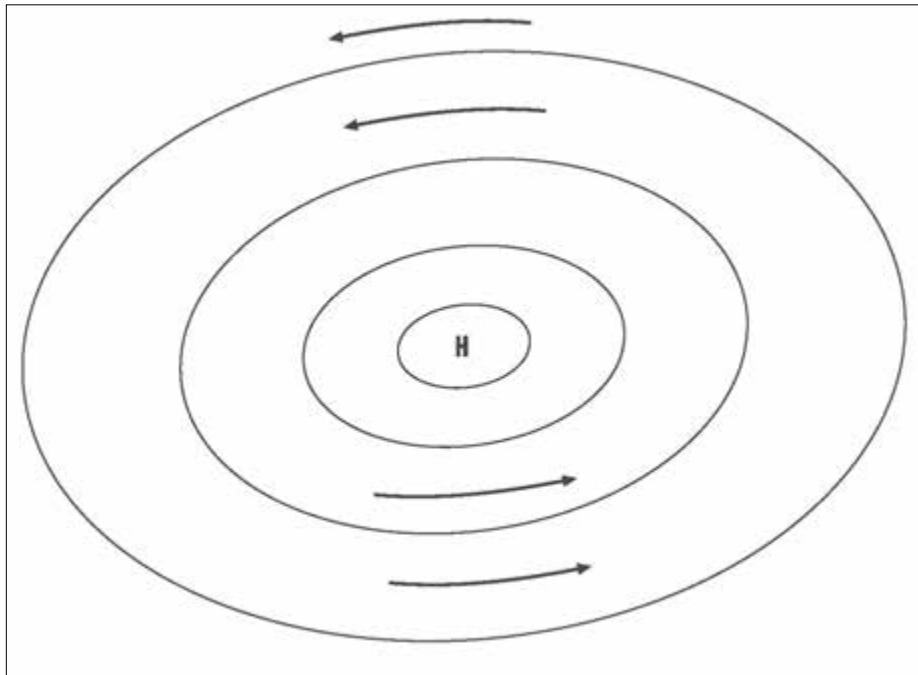
- 1.5.1 meandering (2)
  - 1.5.2 lower course/middle course; it forms where the gradient is gentle (3)
  - 1.5.3 (a) 2 (1)
  - (b) 1 (1)
  - 1.5.4 the arrows labelled 3; this is where the river erodes/has the most energy (4)
  - 1.5.5 A – 2; B – 1; C – 3 (3)
- [14]  
[75]

**Question 2**

- 2.1.1 westerlies
  - 2.1.2 occluded front
  - 2.1.3 hurricane
  - 2.1.4 insolation
  - 2.1.5 turbulent flow
  - 2.1.6 undergraded
  - 2.1.7 floodplain
  - 2.1.8 buttes
  - 2.1.9 ridge
  - 2.1.10 dew point (10 × 1)
- [10]

- 2.2.1 descends
  - 2.2.2 increases
  - 2.2.3 warms
  - 2.2.4 anticlockwise
  - 2.2.5 out of (5 × 1)
- [5]

2.3.1



Remind learners that isobars are lines which join points of equal pressure. They show air pressure with an H to signify a high pressure

- cell – where air descends; skies tend to be clear. An L signifies a low pressure cell where air rises, and skies tend to be cloudy with bad weather. (4 × 2) (8)
- 2.3.2 As a parcel of air descends/sinks, it is compressed. The air pressure increases as the air is squashed more closely together. And as the air pressure increases, the air temperature increases – this is called adiabatic warming. (3 × 2) (6)
- 2.3.3 South Atlantic High, South Indian High (2 × 2) (4)
- 2.3.4 They are the opposite of low-pressure systems or cyclones. (Note it is not because their winds spiral in an anti-clockwise direction in the Southern Hemisphere; they spiral in a clockwise direction in the Northern hemisphere.) (1 × 2) (2)
- [20]  
[75]
- 2.4.1 Urban heat island effect, which is characterised by warm city centres, which are surrounded by cooler suburban and rural areas. (1 × 2) (2)
- 2.4.2 at night or early morning (1 × 2) (2)
- 2.4.3 During the week – any of the following reasons:
- there is more traffic
  - there is more human and industrial activity (2 × 2) (4)
- 2.4.4 Any one of the following:
- by planting of trees or greenbelts
  - by creating water ponds for evaporation
  - by designing buildings with heat-reflecting surfaces (1 × 2) (2)
- [10]
- 2.5 a: dendritic; b: radial; c: rectangular; d: centripetal; e: trellis (5 × 2) (10)
- 2.6.1 The process by which a more energetic river erodes across a watershed and hijacks the flow of a less energetic river. (1 × 2) (2)
- 2.6.2 A waterfall forms where there is a change in base level. The captured river is at a higher level than the captor river. (2 × 2) (4)
- 2.6.3 A: misfit stream (beheaded stream); B: wind gap; C: elbow; D: captor stream (4 × 2) (8)
- 2.6.4 undergraded (it loses energy) (1 × 2) (2)
- 2.6.5 The captor river gains water (new energy) and eroding power. (2 × 2) (4)
- [20]  
[75]

### Question 3

- 3.1.1 True
- 3.1.2 False
- 3.1.3 True
- 3.1.4 True
- 3.1.5 False
- 3.1.6 False
- 3.1.7 False
- 3.1.8 True
- 3.1.9 False
- 3.1.10 True (10 × 1)
- [10]

- 3.2.1 D
- 3.2.2 E
- 3.2.3 B
- 3.2.4 A
- 3.2.5 C (5 × 1)  
[5]
- 3.3.1 Any three of the following:
- water availability
  - physical relief
  - conducive climate for farming
  - sufficient arable land
  - building materials
  - sufficient fuel wood (3 × 2) (6)
- 3.3.2 (a) A: nucleated; B: dispersed (2 × 2) (4)
- (b) Any one of the following for A:
- a church, school, houses and other buildings are situated in close proximity
  - farmsteads are grouped together with a street plan
  - minimal services are offered, such as shops, post office and markets (1 × 2) (2)
- (c) Any two of the following for B:
- situated far apart from one another
  - isolated from neighbours
  - do not share ideas about farming practices (2 × 2) (4)
- 3.3.3 Subsistence farmers farm for own needs and the needs of their immediate family, and their yield per output is low. Commercial farmers farm for commercial purposes, (for a profit) and their yield per output is high. (2 × 2) (4)  
[20]
- 3.4.1 A
- 3.4.2 C
- 3.4.3 E
- 3.4.4 B
- 3.4.5 D (5 × 2) (10)  
[10]
- 3.5.1 Rural depopulation is the migration of rural inhabitants from the area. (1 × 2) (2)
- (a) Any three of the following:
- lack of basic services
  - lack of educational institutions and resources
  - lack of healthcare facilities
  - lack of recreational resources
  - lack of basic infrastructure (e.g. buildings and transport networks)
  - lack of employment
  - poverty (2 × 2) (4)

- (b) Any two of the following:
- It is usually the young working class and men who migrate. Women are left to look after the households and farm.
  - The decrease in population impacts negatively on the economic system and rural areas stagnate. (2 × 2) (4)
- 3.5.2 Urbanisation is a process whereby people migrate from rural areas to urban areas. (1 × 2) (2)
- (a) In developed countries the rate of urbanisation is low because urban areas have reached their peak of urbanisation. In developing countries the rate of urbanisation is high because urban cities have not reached their peak of urbanisation and people are still moving at a fast rate into the urban areas. (1 × 2) (2)
- (b) Any two of the following:
- availability of basic services
  - availability of educational institutions and resources
  - availability of healthcare facilities
  - availability of recreational resources
  - availability of basic infrastructure (e.g. buildings and transport networks)
  - availability of employment
  - better prospects for living (2 × 2) (4)
- 3.6.1 traffic congestion (1 × 2) (2)
- 3.6.2 In the early morning when people are on their way into the CBD and late afternoon when they leave the CBD. (1 × 2) (2)
- 3.6.3 The CBD cannot accommodate all the people who are on the roads. It could be that the transport networks are not properly planned. Because of traffic congestion, pollution increases. (1 × 2) (2)
- 3.6.4 To reduce traffic congestion and air pollution (any three):
- encourage lift clubs
  - encourage the use of public transport
  - more synchronised traffic lights are needed
  - increase parking fees (3 × 2) (6)
- [12]  
[75]

**Paper 1 total: 225 marks**

**Question 1**

- 1.1 C
  - 1.2 B
  - 1.3 B
  - 1.4 D
  - 1.5 C
  - 1.6 A
  - 1.7 A
  - 1.8 B
  - 1.9 A
  - 1.10 C (10 × 1½)
- [15]

**Question 2**

- 2.1 straight line distance on map is 4,2 cm  
scale of map is 1:50 000, so straight line distance in reality is  
4,2 cm × 0,5 cm = 2,1 km  
2,1 km + 53 km = 55,1 km (4 × 2) (8)
  - 2.2 33°29'30''S 22°23'E (2 × 2) (4)
  - 2.3 225° (2 × 2) (4)
  - 2.4 225° – 180° = 45° (2 × 2) (4)
- [20]

**Question 3**

- 3.1 south-east; river flows from high land to lower land, towards the sea (2 × 2) (4)
- 3.2 gently sloping land; large area of relatively flat land suitable to build roads and dwellings; rivers provide water for inhabitants and industry (1 × 1) (2 × 2) (5)
- 3.3 farming (lots of cultivated land); forestry (lots of trees); fishing (coastal area) (2 × 1) (2)
- 3.4 industry (brickworks) (1 × 2) (2)
- 3.5 Any one of the following:
  - very accessible because of the railway line and road network
  - residential area for labour supply (1 × 2) (2)
- 3.6 railway; roads; air travel (2 × 2) (4)

3.7 Any two of the following:

- Fancourt Golf Estate
- Show Grounds
- Crocodile Park

(1 × 2) (2)

3.8 Disadvantages are:

- steep slopes
- not close to major transport routes
- not close to nearest rural settlement (town).

An advantage is the plentiful water supply from the river.

(2 × 2) (4)

[25]

#### Question 4

4.1.1 the use of satellite photographs to gather geographical information

4.1.2 information gathered by satellites

(2 × 2) (4)

4.2 maps; aerial photographs

(2 × 2) (4)

4.3 Spatial data is information about the real world. Attribute data is additional information about a feature (e.g. statistical data).

(2 × 2) (4)

4.4 Any three of the following:

- dwellings
- population size
- other buildings
- recreational areas

(3 × 1) (3)

[15]

**Paper 2 total: 75 marks**

**Geography topics:** Economic geography of South Africa; Geographical skills and techniques

### Resources

Learner's Book pages 337–338

### Background

- This task focuses on Term 3 of *Study & Master Geography* Grade 12 and therefore should be scheduled for after the learners have completed Modules 7 and 8. (See Year Plan on pages 6–17).
- The skills covered in this task are geographical skills and techniques – reading, analysing and interpreting maps, working with concepts, dates, procedures related to GIS, and evaluating, expressing and supporting a point of view.
- Allow some class time in Week 8 to go through the task with learners. Set the task as homework for the learners.
- The task in the Learner's Book is out of 60 marks. You will need to convert this to a mark out of 20 for contribution of this assessment to the year mark. (See Recording and reporting, on page 252.)

### Preparing the learners

- Remind the learners that they should work on their own and answer all questions.
- Let them read through the task and ask questions about any part of it that they do not understand.
- Remind them that they can consult Modules 7 and 8 in the Learner's Book if they need to.
- Give them a due date for the completed task.

### The task

You will find Assessment Task 3 on pages 337–338 of the Learner's Book. A marking memorandum is supplied on pages 203–204 under the heading, 'Assessment guidance'.

**Question 1**

1.1 D; 1.2 E; 1.3 F; 1.4 A; 1.5 G

[5]

**Question 2**

- a. tertiary
- b. forward integration
- c. direct
- d. subsistence
- e. graphic

[10]

**Question 3**

- a. it is easy to use bias; questions can be non-representative
- b. summarise data; compare data from different sources; forecast future outcomes
- c. dual
- d. substitute
- e. tertiary

[5]

**Question 4**

- a.
  - i. capital intensive; have a large impact on the environment; are generally heavy in bulk of raw materials (2)
  - ii. need the proximity of a competitive market for feedback from consumers; if the product increases in size with production, location is closest to the market (2)
  - iii. do not have to be close to raw materials or markets; do not employ many people; are quick to react to market trends; are flexible in changing direction; operate through direct marketing via email, fax and telephone (2)
- b. sugar industry; aluminium industry (2)
- c. safe, efficient transport of people; national cover for distribution of goods and services; airports and ports for the import and export of goods (2 × 2) (4)
- d. IDZs stimulate economic growth in areas where there is the potential for growth by investment in infrastructure for industries; SDIs focus more on previously disadvantaged areas to encourage job opportunities by stimulating investment in industrial schemes. (2 × 2) (4)
- e. strain on service delivery; impact on the environment; limited space for expansion; growth of informal settlements; social unrest can occur if social delivery does not keep pace with demand (2 × 2) (4)

[20]



### Question 5

- wine; fruit; canning of food; fish; textile; petroleum ( $2 \times 2$ ) (4)
- raw materials such as fruit; Mediterranean climate; proximity to nuclear power reactor for power supply; abundant skilled and unskilled labour; access to domestic and international markets ( $3 \times 2$ ) (6)
- shadow economy; black economy (2)
- Points to include: no legal rights for workers; tensions caused by price under-cutting/often vulnerable women are employed; low wages; no sick benefits, UIF, or pensions; difficult to access credit or loans ( $4 \times 2$ ) (8)

[20]

**Total: 60 marks**

Convert for a final mark out of 20

Teacher's Guide  
pages 204–206

## Test 2

## Economic geography

TERM 3, WEEK 10

**Geography topic:** Economic geography of South Africa

### Resources

Photocopies of the test in this Teacher's Guide (pages 204–206)

### Background

- The test focuses on material covered in Term 3 and the questions require lower-order, middle-order and higher-order thinking skills from the learners.
- The test is out of 20 marks. You will need to convert this to a mark out of 10 for contribution of this assessment to the year mark.

### Preparing the learners

- At the beginning of Term 3, spend some time discussing what material learners will need to cover for the test.
- In week 4 or 5 of Term 3, spend some time discussing the format of the test, including how much time learners will be given to complete it (1 hour).
- Remind the learners that they will need to revise all the work covered in Module 7.
- Explain that the way that the test is structured means that they will not be able to leave out any sections of work as they prepare for it.

### Test 2

You will find a test that you can use for Test 2 on pages 204–206 of this Teacher's Guide. You may photocopy this test. Alternatively, design your own test.

### Assessment guidance

You will find a memorandum for Test 2 on pages 207–208 of this Teacher's Guide. You may photocopy this memorandum if you wish to.

**Question 1**

1. Define what is meant by each of the following terms:

- 1.1 economic activities
- 1.2 resources
- 1.3 formal sector
- 1.4 quaternary sector
- 1.5 LEDC (5 × 2)

[10]

**Question 2**

2.1 Draw a bar graph, using the percentages in the table below, to show the employment contribution the three economic sectors made to the South African economy in 2011. (5)

Economic sector	Percentage contribution to the economy from employment, 2011
Primary	9
Secondary	26
Tertiary	65

2.2 What does the percentage employment in each sector of the economy suggest about the level of development in South Africa? (3 × 2) (6)

2.3 Suggest how the percentages may change as South Africa becomes increasingly more developed. (2)

2.4 Name two other ways in which the information in the above table could have been displayed. (2)

2.5 Give the name that describes the visual method of representing data, facts or knowledge. (1)

2.6 Based on your answer to question 2.5:

2.6.1 Name one advantage of using this means of representing data. (1)

2.6.2 Name one disadvantage of using this means of representing data. (1)

2.7 The United Nations and World Bank use the US dollar as an ‘international’ currency. Explain:

2.7.1 Why many countries feel that the USA is just another larger, more powerful colonising power (2)

2.7.2 Why these two world organisations chose to use the US dollar for economic comparisons (2)

[22]

**Question 3**

- 3.1 Why is it important that the government supports agricultural initiatives? (2)
- 3.2 Compare the advantages of commercial and subsistence farming in South Africa. Copy the table and name three advantages and three disadvantages for each farming sector. (3 × 2) (6)

	<b>Commercial farming</b>	<b>Subsistence farming</b>
1		
2		
3		

- 3.3 Name two indigenous South African agricultural exports. (2)
- 3.4 Which is South Africa's chief agricultural export destination in Europe? (1)
- 3.5 In what way could land ownership issues continue to be a negative influence on agricultural output in South Africa? (2)
- 3.6 Define what is meant by the term 'marginal land'. (2)
- 3.7 Suggest why urban and peri-urban agriculture is important. (4)

[19]

**Question 4**

- 4.1 Give three ways in which the discovery of diamonds and gold contributed to the development of South Africa. (3)
- 4.2 Name a 'strategic' mineral and explain why it is important. (3)

[6]

**Question 5**

- 5.1 Name three industries in South Africa. (3)
- 5.2 Define what is meant by each of the following terms:
  - 5.2.1 ubiquitous industries
  - 5.2.2 light industries
  - 5.2.3 heavy industries
  - 5.2.4 bridge or break-of-bulk point industries
  - 5.2.5 raw material orientated industries (5 × 2) (10)
- 5.3 Name the four regional industrial areas in South Africa. (4)
- 5.4 Explain why the government is involved in a 'decentralisation' process for industrial development. (2)
- 5.5 List three ways in which the informal sector contributes to the South African economy. (3)
- 5.6 Give one challenge that faces the government with regard to the informal sector. (1)

[23]

**Total: 80 marks**

Convert for a final mark out of 20

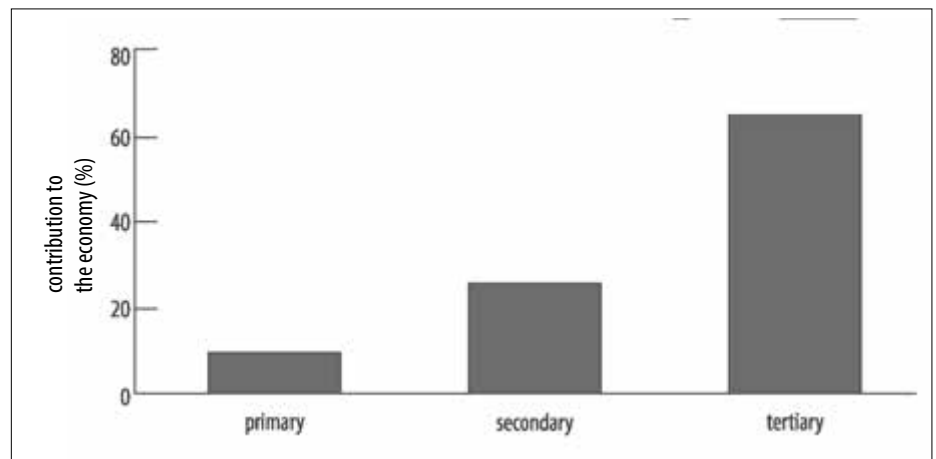
**Question 1**

- 1.1 Economic activities: Involve resources, which are the inputs, and products or services, which are the outputs. Money is paid in direct relationship to value added to the inputs. (2)
- 1.2 Resources: Land, labour, capital and entrepreneurship. (2)
- 1.3 Formal sector: Economic activities that occur in a regulated, supervised way involving local or national government laws. (2)
- 1.4 Quaternary sector: Research and development, or intellectual activities. (2)
- 1.5 LEDC: Lesser Economically Developed Country. (2)

[10]

**Question 2**

2.1



(5)

- 2.2 South Africa has the majority of people involved in tertiary and above economic activities. This suggests that the economy is well-developed. (3 × 2) (6)
- 2.3 The percentage involved in tertiary economic activities will increase and the other two areas, especially primary, will decline. (2)
- 2.4 line graph; pie graph; histogram (2)
- 2.5 statistics (1)

2.6

- 2.6.1 it is visual; clear; easy to read; quick to read; easy to compare (1)
- 2.6.2 it can distort information; use bias (1)

2.7

- 2.7.1 Countries may resent the power that using the currency of the USA as a world currency presents. (2)
- 2.7.2 The USA is a powerful economic country; one currency has to be used because of the individual currencies of nation states. (2)

[22]

**Question 3**

- 3.1 South Africa needs to have food security; cheap food; available food; nutritious food; employment; products to export (2)

3.2

	Commercial farming	Subsistence farming
1	greater output	provides food security
2	surplus is exported	provides small surpluses for exchange or sale
3	provides employment	provides nutrition
4	stimulates the economy	provides self-sufficiency
5	feeds the nation	easy to adapt to changes

(3 × 2) (6)

3.3 Rooibos tea; fynbos flowers (2)

3.4 the United Kingdom (1)

3.5 The effect of past legislation where 13% of the land was given to black Africans as homelands; the wait for claims to land to be approved; the lack of financial and knowledge capital among the previously disadvantaged people (2)

3.6 land which is on the edge of good grazing; fertile soil; plentiful rain (2)

3.7 provides food security; sustainability; nutrition; self-sufficiency; surplus for sale (4)

[19]

#### Question 4

4.1 opened up the country to immigration; new skills and cultures; railways; infrastructure; industries to support the mines (3)

4.2 chrome; titanium; vanadium; it is important because it is scarce; no substitutes exist; vital to certain industries (3)

[6]

#### Question 5

5.1 metal; textile, clothing and footwear; information and communication technology; chemicals; automobile; agricultural industries (3)

5.2

5.2.1 do not rely on any one input; are spread evenly; are found everywhere

5.2.2 less capital intensive; less environmental impact; do not need zoning regulations; less space required

5.2.3 more capital intensive; greater impact on environment; need space; have bulky materials

5.2.4 industries that are situated at a break-of-bulk point where off-loaded raw materials are changed in form before being sent as a new product elsewhere

5.2.5 industries that use bulky raw materials are situated closest to the source, e.g. iron and steel industry; thermal power (5 × 2) (10)

5.3 PWV-Gauteng; Durban-Pinetown; South Western Cape Metropole; Port Elizabeth-Uitenhage (4)

5.4 It creates new job opportunities; it spreads economic development; it takes away the pressure for services, land and employment in the existing areas (2)

5.5 gap markets; provides goods and services close to customers; provides job opportunities; can adapt to cycles in the economy; no rules or regulations gives freedom of enterprise to entrepreneurs (3)

5.6 collection of tax from money earned from the informal sector; stimulating the informal sector to allow for more stability and the guarantee of workers' security, without making regulation too difficult (1)

[23]

**Total: 80 marks**

Convert for a final mark out of 20

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

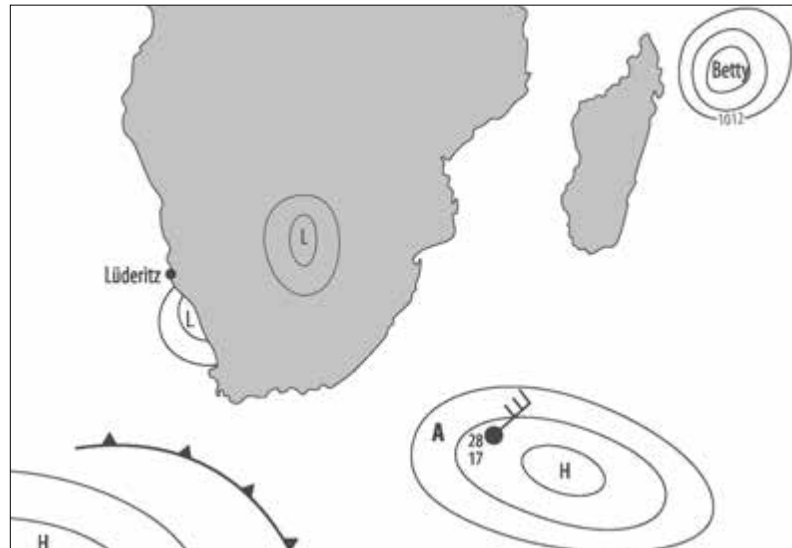
**INSTRUCTIONS AND INFORMATION**

- This paper consists of FOUR questions.
- ONLY answer ANY THREE questions of 75 marks each.
- Answer the paragraph-type questions in the form of a paragraph, and NOT in MEMO FORMAT.
- Most of the questions have an accompanying figure/ diagram. Study these SOURCES thoroughly.
- Feel free to use drawings/ diagrams to illustrate your answers.

**Section A: Climate and weather; Geomorphology**

**Question 1**

1.1 Look at Figure 1.1 below. Then answer the multiple-choice questions by writing down only the number of the correct answer next to the question number, e.g. 1.1.1:F.

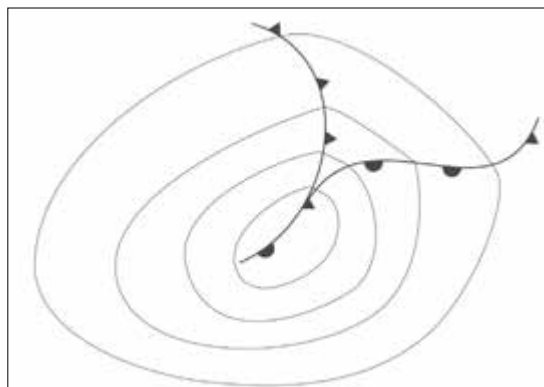


**Figure 1.1** Synoptic weather map

- 1.1.1 The cloudy weather in the interior of South Africa is caused by the:
- A. anticlockwise rotation of the Kalahari high-pressure system
  - B. clockwise rotation of the cold front
  - C. clockwise rotation of the coastal low along the west coast
  - D. anticlockwise rotation of the South Indian high-pressure cell
- 1.1.2 The cloudy conditions over the interior are especially characteristic of the:
- A. spring
  - B. autumn
  - C. winter
  - D. summer
- 1.1.3 The coastal low along the west coast is responsible for:
- A. mountain winds
  - B. fog formation

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- C. mountain winds and fog formation
  - D. none of the above
- 1.1.4 Which statement is TRUE with respect to A in Figure 1.1:
- A.  $\frac{1}{8}$  cloud cover is found in A.
  - B. A south-westerly wind of 30 knots is predicted.
  - C. The temperature will drop within the next 24 hours.
  - D. The minimum temperature is 17 °C.
- 1.1.5 The tropical cyclone BETTY is moving in a:
- A. north-westerly direction
  - B. south-westerly direction from 0° latitude
  - C. south-westerly direction from 5° southern latitude
  - D. north-westerly direction from 15° eastern latitude
- 1.1.6 BETTY is probably in the occlusion phase because:
- A. the pressure in the trough is higher than 1004 hPa
  - B. the isobars are close together
  - C. the cyclone's name starts with a B
  - D. it has already moved over Madagascar
- 1.1.7 BETTY's top left quadrant is experiencing the worst weather conditions. This is caused by the:
- A. rotation speed
  - B. propagation speed
  - C. rotation and propagation speed
  - D. hurricane winds occurring within 160 km from the centre
- 1.1.8 Due to the Coriolis force, BETTY:
- A. cannot form closer than 5° to the Equator.
  - B. cannot form closer than 5° to the Equator and turns around at 30° southern latitude
  - C. causes destructive weather conditions
  - D. rotates in an anticlockwise direction
- 1.1.9 In a cold front:
- A. air masses converge from opposite directions
  - B. friction and deflection never occurs
  - C. the air masses will assimilate and become one descending air mass
  - D. a moisture front and thunderstorms would be common appearances
- 1.1.10 In this cyclone of the mid-latitudes:



© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- A. the cyclone is in its formative stage
- B. the cyclone is in the occlusion stage
- C. the cyclone is accompanied by hail and lightning
- D. the cyclone's warm sector is not isolated from the surface

1.1.11 South Africa's plateau character causes:

- A. a reduction in interior temperatures
- B. a reduction in the amount of oxygen at high altitudes
- C. low rainfall on the west coast
- D. an increase in ozone-damaging ultra-violet rays

1.1.12 Advection fog occurs when:

- A. hot and cold air mix, with one of them in horizontal movement
- B. air moves up very slowly at a gradual slope
- C. cold fronts pass over an area
- D. the Earth's surface radiates all the heat it received from the Sun

1.1.13 Which of the following terms are not related to altitude?

- A. isobars
- B. hectopascal
- C. isohyets
- D. barometer

1.1.14 The feature A in Figure 1.2 is called:

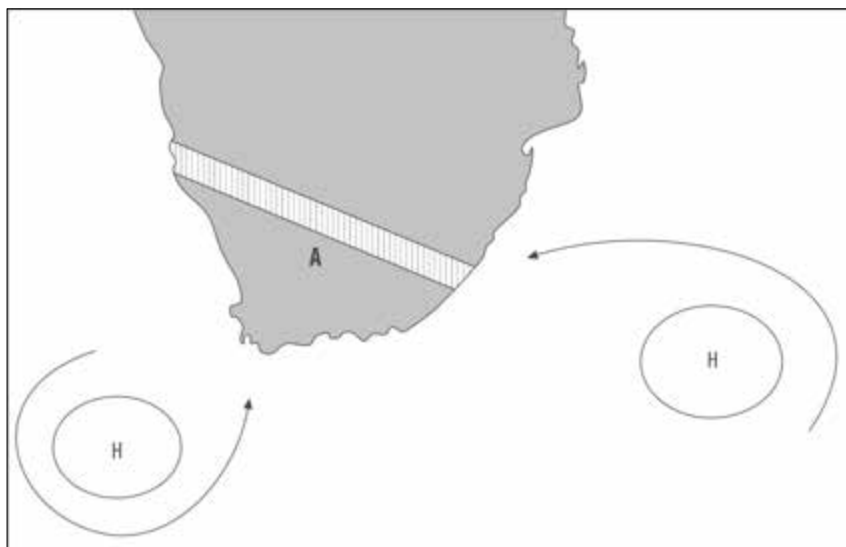


Figure 1.2

- A. straight-line winds
- B. polar front
- C. moisture front
- D. inversion layer

1.1.15 Inversion:

- A. is the sudden rise in temperature with an increase in altitude
- B. prevents pollution from forming over a valley
- C. reduces the chance of frost in the interior of the country during summer
- D. is caused by the Kalahari high-pressure cell

(15 × 1)  
[15]



1.2 Study Figure 1.3. Then answer the questions that follow.

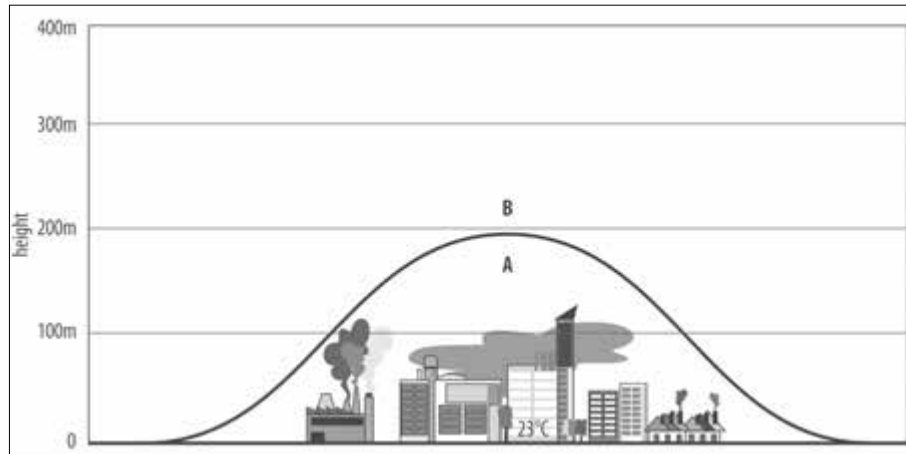


Figure 1.3 Urban climate

- 1.2.1 What natural phenomenon is represented in this diagram? (2)
  - 1.2.2 Will the temperatures at A and B be respectively warmer or colder than 23 °C? Give a reason for your answer in each case. (2 × (1 + 2)) (6)
  - 1.2.3 Name a human activity that is responsible for the phenomenon that is represented in the diagram. (1 × 2) (2)
  - 1.2.4 How will the appearance of this phenomenon vary between day and night? Explain this variation. (2 × 2) (4)
- [14]

1.3 Refer to Figure 1.4. Then answer the questions that follow.

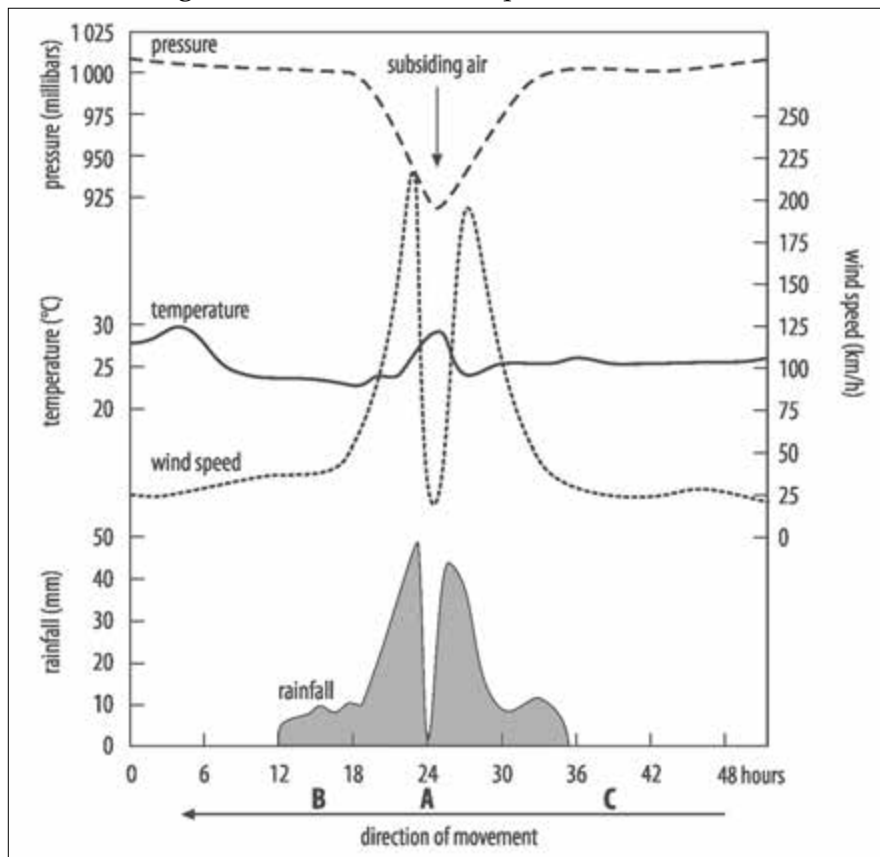


Figure 1.4 Atmospheric conditions when a tropical cyclone passes over an area

- 1.3.1 Describe how the rainfall pattern has changed over the 48-hour period. (1 × 2) (2)

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- 1.3.2 What was the maximum wind speed recorded in the period? (1 × 2) (2)
- 1.3.3 What major changes occurred in the wind direction after 24 hours? (1 × 2) (2)
- 1.3.4 What was the lowest pressure recorded during this period of observation? (1 × 2) (2)
- 1.3.5 In what part of the tropical cyclone do we find the lowest readings with regard to air pressure and wind and rain? Identify and explain this phenomenon. (2 × 2) (4)
- 1.3.6 Where would the tropical cyclone be experienced at its most extreme on the surface – at A, B or C? Explain. (2 × 2) (4)
- [16]

1.4 Study Figure 1.5. Then answer the questions that follow.

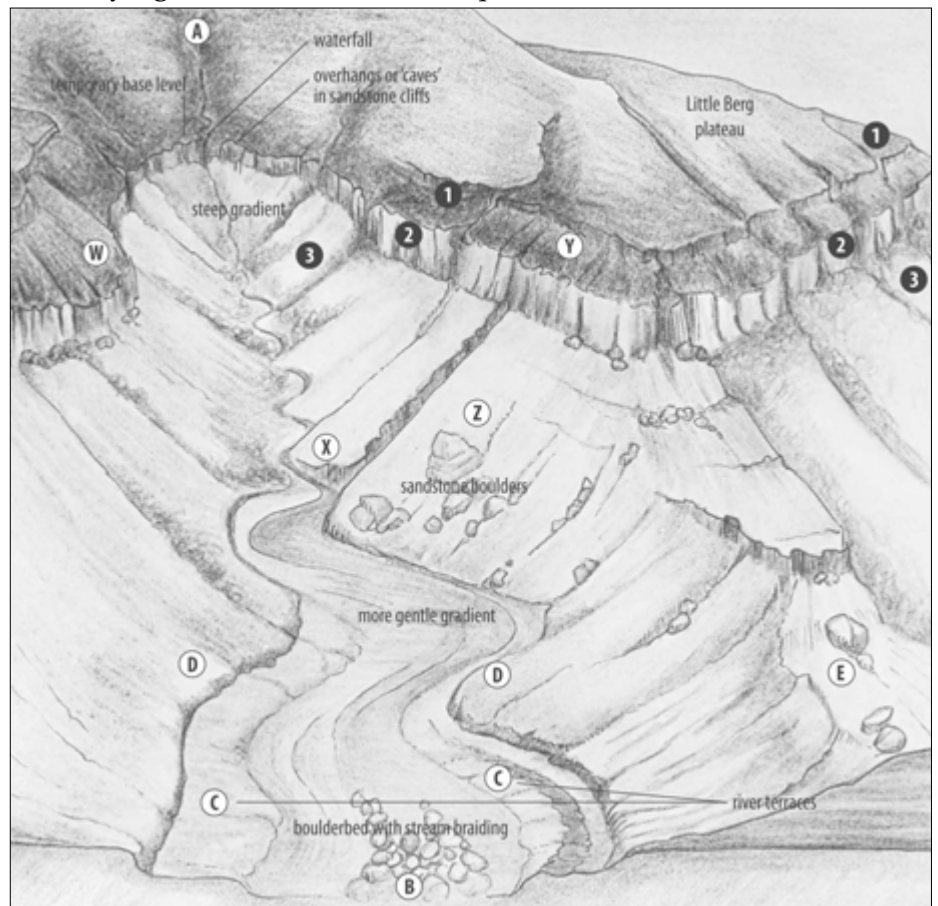


Figure 1.5 Typical river course in the lower Drakensberg in KwaZulu-Natal

- 1.4.1 What stream channel characteristic is labelled E? (1 × 2) (2)
- 1.4.2 Explain the concept of 'temporary base level of erosion'. (1 × 2) (2)
- 1.4.3 Draw a longitudinal profile of the river from A to B, and mark the waterfall. (2 × 1) (2)
- 1.4.4 Is this profile you drew graduated? Explain your answer. (2 × 2) (4)
- 1.4.5 The river terraces at C are evidence that rejuvenation has occurred. Explain the concept of 'rejuvenation'. (1 × 2) (2)
- 1.4.6 Label the slope forms marked 1, 2 and 3 respectively. (3 × 2) (6)
- 1.4.7 Which of the above slope forms are convex? (1 × 2) (2)
- 1.4.8 The air circulation against the slopes of the valley has a big impact on farming activities at X. Identify the typical air movement taking place by day and at night and explain how these arise. Go on to explain (10–12 lines) what effect this air movement has on farming activities at X. (5 × 2) (10)

[30]

[75]

**Question 2**

2.1 Look at Figure 2.1A below. Then answer the multiple-choice questions by writing down only the number of the correct answer next to the question number, e.g. 2.1.1:F.



Figure 2.1A Drainage basin

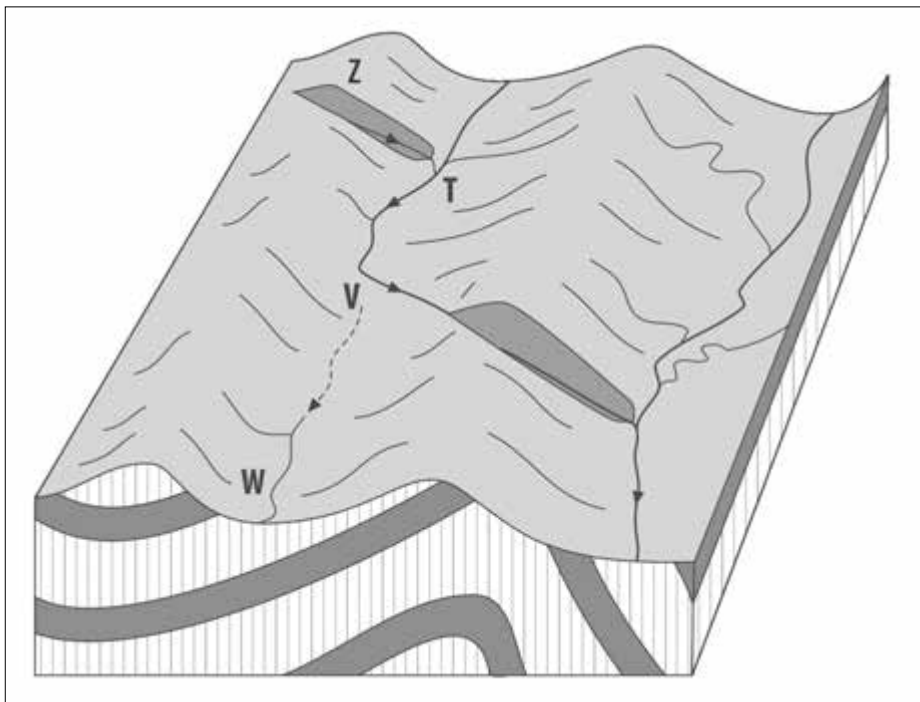


Figure 2.1B Water course

2.1.1 The type of groundwater that occurs at X is:

- A. magmatic water
- B. connate water
- C. meteoric water
- D. simultaneously included water

2.1.2 The landform B is called a:

- A. batholith
- B. corridor
- C. lopolith
- D. tor

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- 2.1.3 The stream order of the river system at point S is:  
 A. 5  
 B. 4  
 C. 3  
 D. 2
- 2.1.4 The stream pattern at P is:  
 A. dendritic  
 B. horizontal  
 C. disrupted  
 D. radial
- 2.1.5 The landform A:  
 A. has a coating called a cuesta  
 B. consists of crystalline rocks  
 C. is also called a homoclinal ridge  
 D. will be called a butte in the geological future
- 2.1.6 In the vicinity of V we will find a \_\_\_ that proves that river capture has occurred.  
 A. elbow of capture and a waterfall  
 B. wind gap and impoverished river and a tor  
 C. impoverished river and an elbow of capture  
 D. antecedent knickpoint
- 2.1.7 The stream volume:  
 A. will increase at T as a result of river capture  
 B. will increase at W as a result of river capture  
 C. of Z will not be affected by river capture at all  
 D. will decrease at Z as a result of an impoverished river (7 × 1) (7)
- 2.2 Select from Column B an appropriate statement for each of the terms in Column A. Write only the letter next to the question number.

Column A	Column B
2.2.1 solifluction	A. a vast, level plain B. erosion of a slope at a constant angle C. mechanical weathering due to expansion and contraction D. when river is older than the structures over which it is flowing E. main stream with 90° bends over seamed rocks F. ground flow in areas with low temperatures occurs as result of thawing of soil G. water that infiltrates and seeps into the Earth's crust H. tributaries join main stream at right angles I. the slope form closest to the perpendicular cliff J. rocks making up tors
2.2.2 exfoliation	
2.2.3 core stones	
2.2.4 pediplain	
2.2.5 escarpment retrocession	
2.2.6 antecedents	
2.2.7 trellis	
2.2.8 indirect run-off	

(8 × 1) (8)

2.3 Refer to Figure 2.2A of a local river system and Figure 2.2B of a hydrograph. Two rivers, X and Y, form part of a local river system. River X meanders through a wetland, while river Y has no wetlands, but runs through major cultivated agricultural areas.

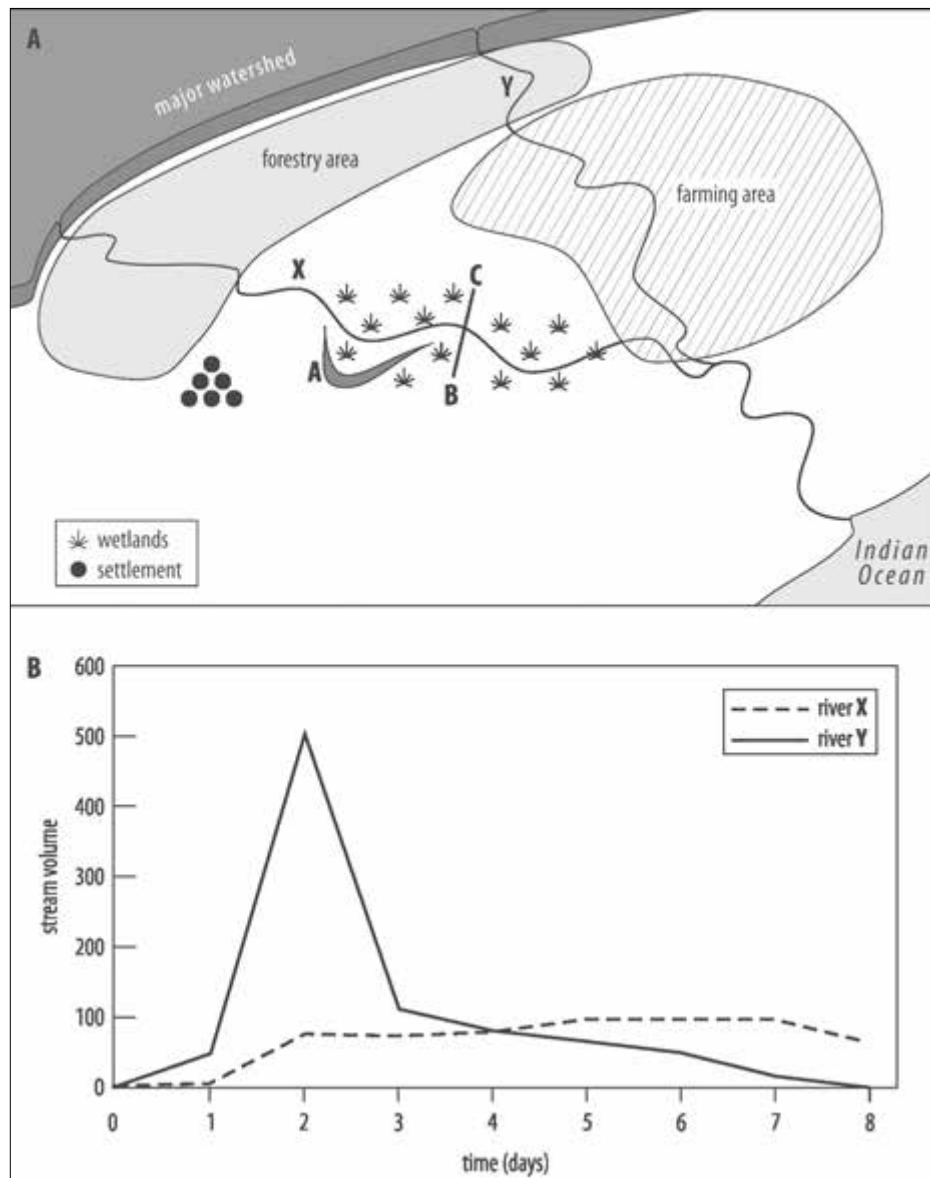


Figure 2.2 River system and accompanying hydrograph

- 2.3.1 Describe one important characteristic of a wetland. (1 × 2) (2)
- 2.3.2 What is an important ecological function of a wetland? (1 × 2) (2)
- 2.3.3 Compare the hydrographs of rivers X and Y in Figure 2.2B.
  - (a) In what unit is stream volume measured? (1 × 2) (2)
  - (b) What river has the highest flood peak? What does this mean? (2 × 2) (4)
  - (c) Which river has the shortest run-off time? (1 × 2) (2)
- 2.3.4 Identify the landform marked A in Figure 2.2A. How is A formed? (2 × 2) (4)
- 2.3.5 Draw a cross-sectional profile of the meander from B to C and label your sketch. (2 × 2) (4)

[20]

2.4 Study Figure 2.3. Then answer the questions that follow.

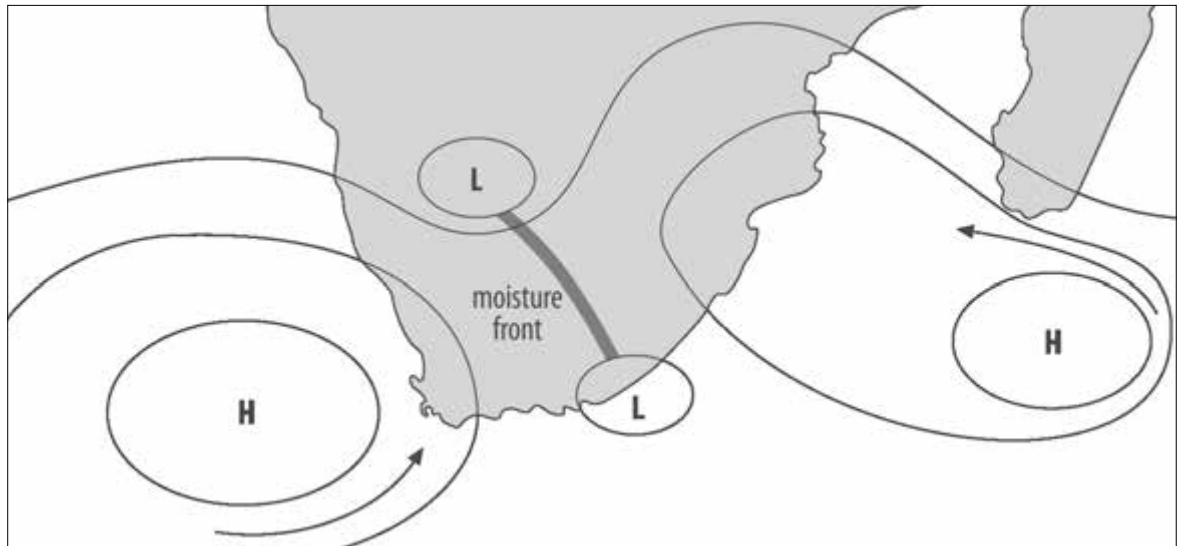


Figure 2.3 Moisture front

- 2.4.1 Which environmental conditions lead to the formation of the moisture front? (2 × 2) (4)
- 2.4.2 During which season does this phenomenon occur? Explain. (2 × 2) (4)
- 2.4.3 A moisture front is associated with thunder storms. Define the term, 'straight-line thunderstorms'. (1 × 2) (2)
- [10]

2.5 Study Figure 2.4. Then answer the questions that follow.

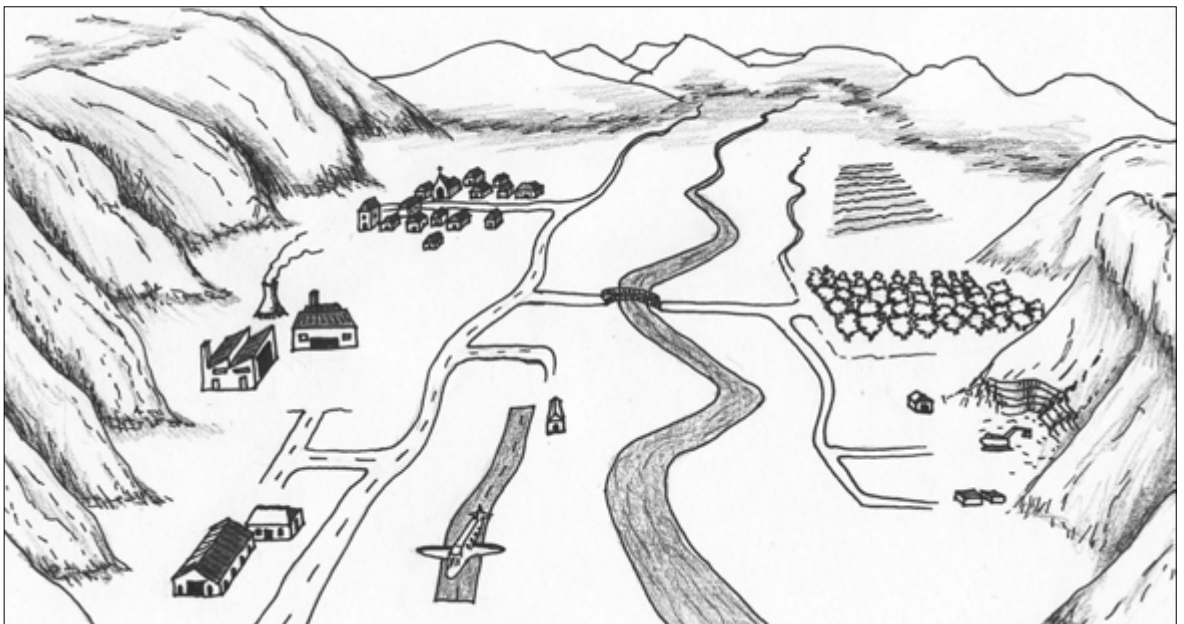


Figure 2.4 Field sketch of the Harts River Valley

- 2.5.1 Why are citrus orchards, which are sensitive to frost, cultivated on the slopes of the valley? (1 × 2) (2)
- 2.5.2 Why does the valley experience a blanket of smog and pollution on some winter mornings? (1 × 2) (2)
- 2.5.3 Which income group would live closest to the industrial area? (1 × 2) (2)
- 2.5.4 Why are the temperatures in Hartswater slightly warmer than the temperature on the surrounding farms? (1 × 2) (2)
- 2.5.5 Hartswater is a rural village in the famous \_\_\_\_\_ irrigation scheme in the North West Province. (1 × 2) (2)
- [10]

2.6 Study the synoptic weather map in Figure 2.5. Then answer the questions that follow.

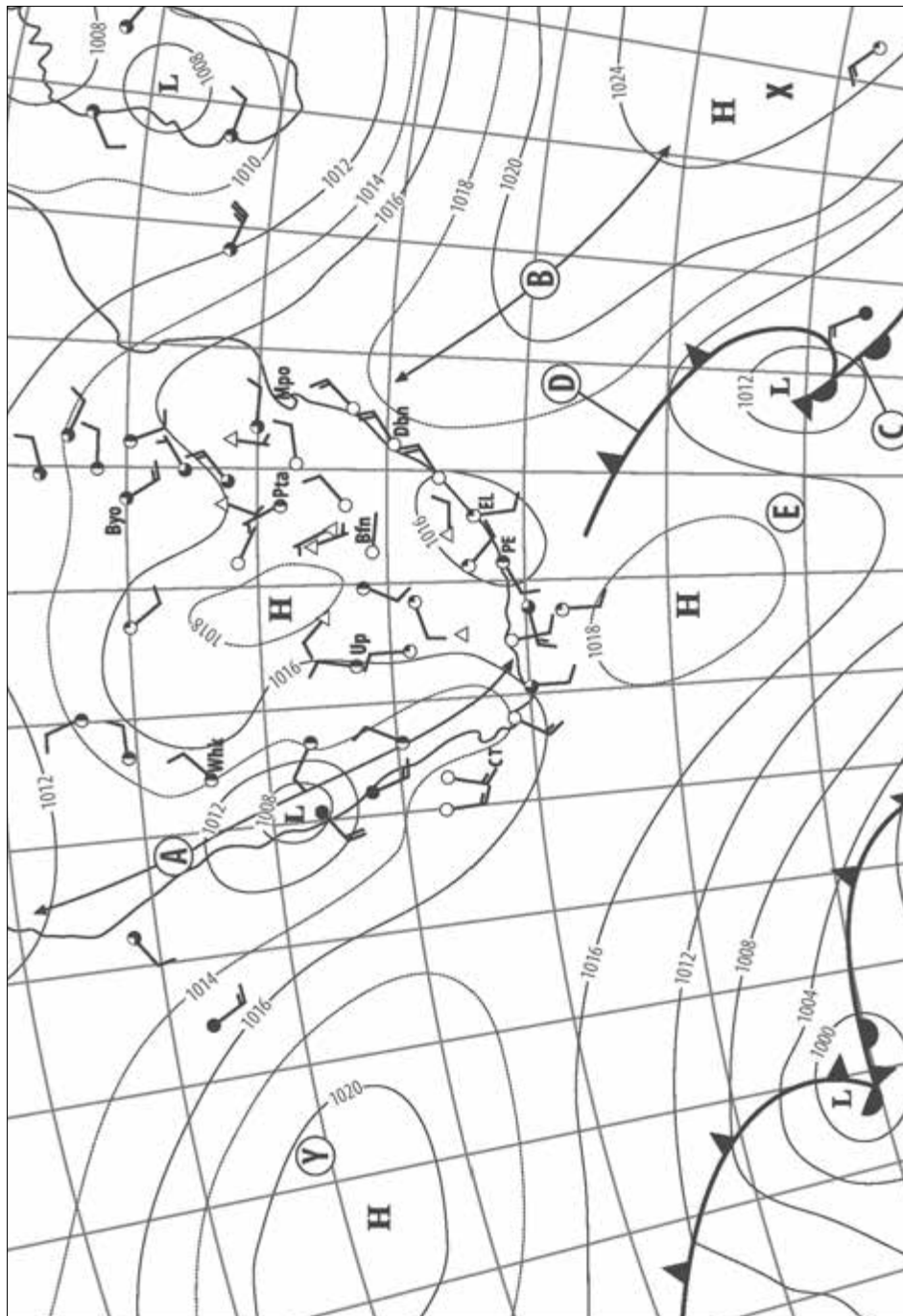


Figure 2.5 Synoptic weather map

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- 2.6.1 Provide the correct synoptic terms for the phenomena marked B and C. (2 × 2) (4)
- 2.6.2 Identify the high-pressure cell marked X. (1 × 2) (2)
- 2.6.3 Describe the air movement in the pressure cell marked Y. (2 × 2) (4)
- 2.6.4 The air-pressure cells X and Y belong to the \_\_\_\_\_ belt. (1 × 2) (2)
- 2.6.5 Name the system of which C, D and E form part. Describe this system's direction of motion. (2 × 2) (4)
- 2.6.6 Is it a winter or summer synoptic weather map? Give a reason for your answer. (2 × 2) (4)
- [20]  
[75]

## Section B: Rural settlements; Urban settlements

### Question 3

#### 3.1

- 3.1.1 Use some of the terms in the box below to complete the pyramid in Figure 3.1, which represents the hierarchy of settlements. Write down only the letter and the correct term next to it, e.g. E town. (4)



(4 × 1) (4)

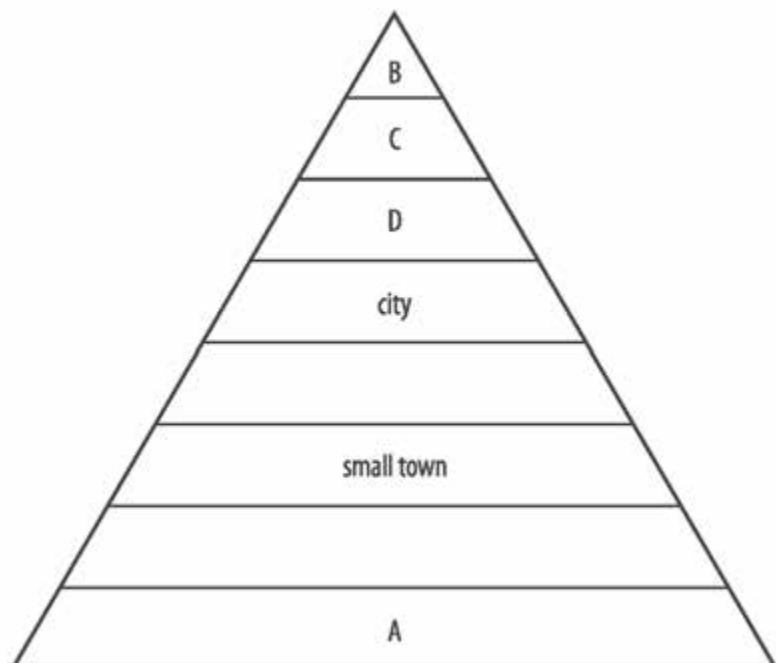


Figure 3.1 Hierarchy of settlements

© You may photocopy this page for use with *Study & Master Geography Grade 12*.



- 3.1.2 Give one word for each of the following definitions/explanations.
- (a) The exact location a settlement takes up.
  - (b) The distance that people are willing to drive to a shop or service.
  - (c) The farmer who uses machinery to produce a surplus to sell for a profit.
  - (d) Professionals offer these types of services or functions.
  - (e) The economic sector under which the research done at an experimental farm falls. (5 × 1) (5)

3.1.3 Answer the multiple-choice questions by writing down only the number of the correct answer next to the question number, e.g. 2.1.1:F.

- (a) A settlement is classified as rural based on:
  - A. the number of people in the settlement
  - B. the size of the settlement
  - C. the function it fulfils
  - D. the number of activities that take place there
  
- (b) Basic needs that must be met include:
  - A. drinking water, plough-land, topography
  - B. grazing land, fuel, prevailing winds
  - C. building material, temperature, plough-land
  - D. drinking water, fuel, grazing land
  
- (c) Select the statement that does not fit in with the others:  
Causes of impoverishment of the rural areas in developing countries are:
  - A. a low rate of urbanisation
  - B. consolidation of farm units
  - C. high population growth
  - D. low agricultural production
  
- (d) Urban growth:
  - A. is when the % urban population in a country increases
  - B. is when the population of a city increases
  - C. indicates the expansion of the city's surface
  - D. indicates buildings in the city becoming taller
  
- (e) Smithfield in the Free State is typical example of:
  - A. a farming town
  - B. a transport town
  - C. a commercial town
  - D. a central place town
  
- (f) Which statement is not correct?
  - A. Burgess focused primarily on the distribution of socio-economic classes.
  - B. Both took into account the multiple-nuclei model and the sector model in all land uses.
  - C. Hoyt placed particular emphasis on high-income neighbourhoods.
  - D. According to Harris and Ullman, a city's functional structure appears to have a cell-formed aspect rather than a concentration or sector aspect. (6 × 1) (6)

[15]

3.2 Study Figures 3.2A and B. Then answer the questions that follow.

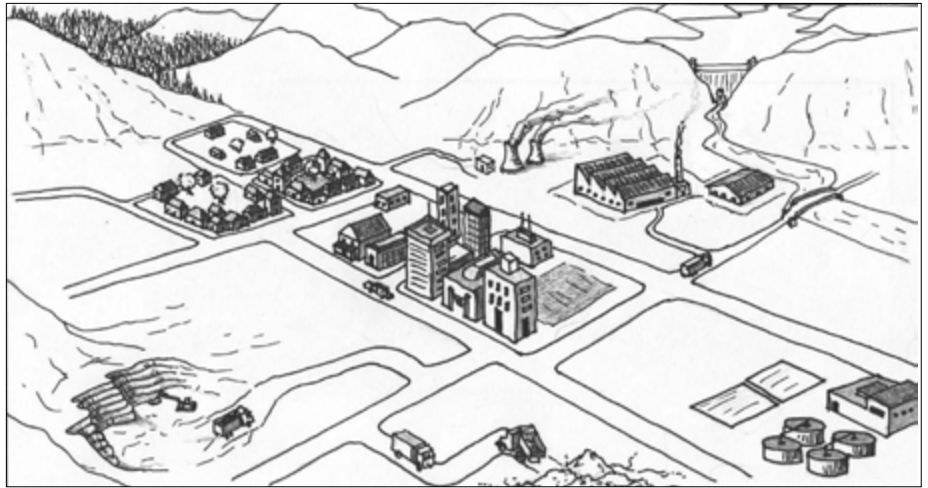


Figure 3.2A Urban land use zones

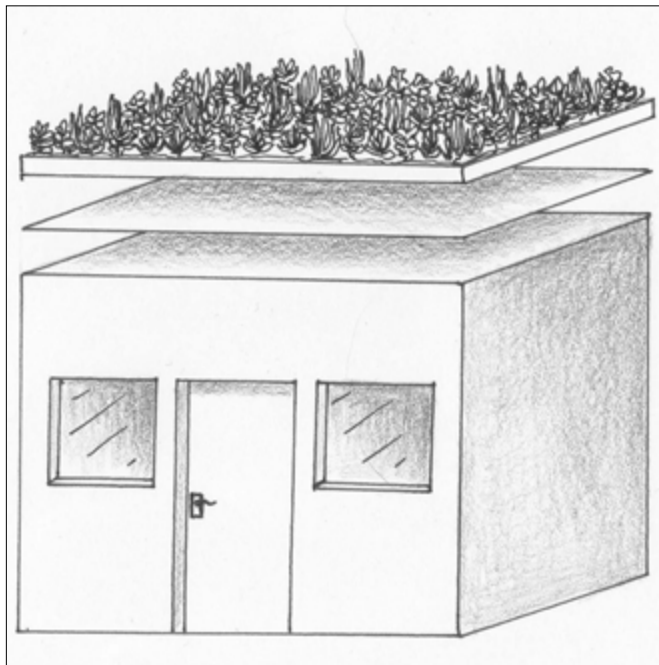


Figure 3.2B Roof gardens and the urban ecological footprint

- 3.2.1 Explain the term 'ecological footprint' (1 × 2) (2)
- 3.2.2 Roof gardens play an important role in the health of the city's climate, as a result of pollution.
- Provide an explanation to substantiate this fact. (1 × 2) (2)
  - How are contemporary urban climates affected by pollution? (2 × 2) (4)
  - In which urban land use zone are roof gardens likely to occur? (1 × 2) (2)
  - Roof gardens are not possible everywhere in cities. What alternative plan do you suggest for those areas where it is not possible, to help address pollution? (1 × 2) (2)

[12]

3.3 Study the map in Figure 3.3, which suggests settlement patterns. Then answer the questions that follow.

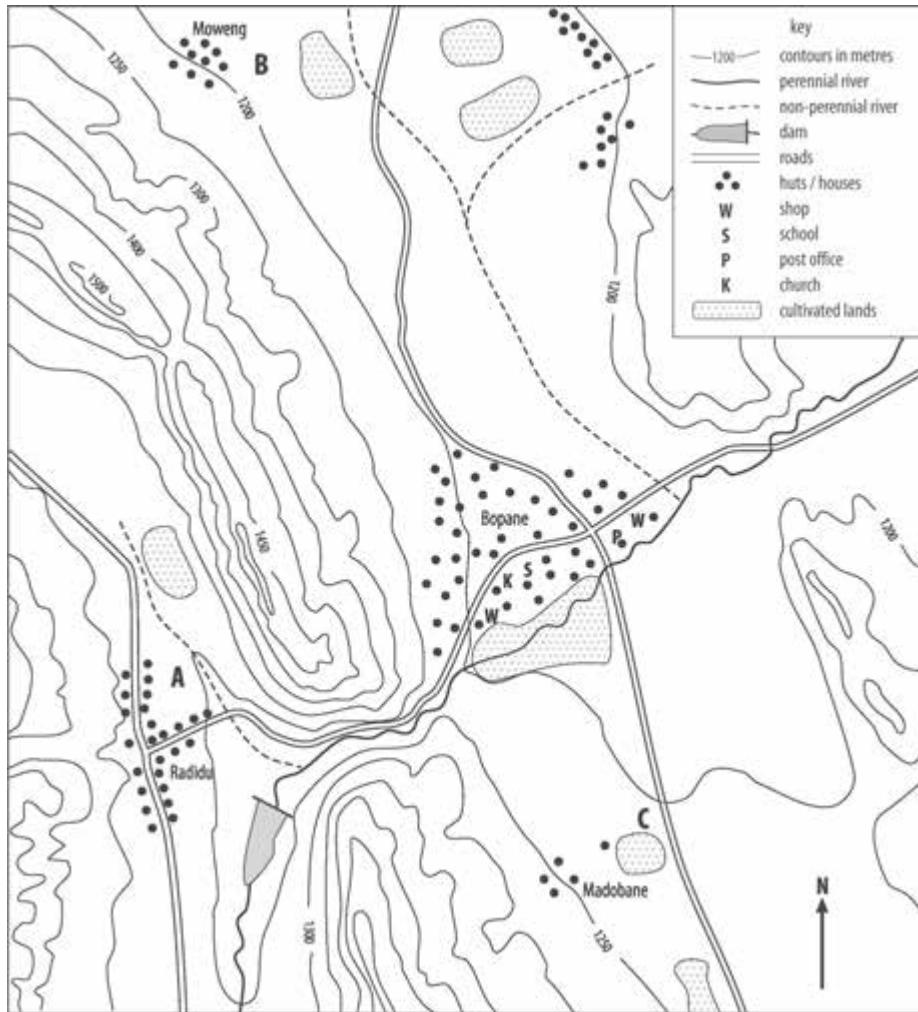


Figure 3.3 Settlement patterns

- 3.3.1 Name a physical factor that led to the development of Bopane on that site. (1 × 2) (2)
- 3.3.2 Many of the people in this region are subsistence farmers. Explain one of the problems they experience. (1 × 2) (2)
- 3.3.3 Many of the residents of Bopane moved to Zeerust, 32 km away. Explain the push factors that could have contributed to this move. (2 × 2) (4)
- 3.3.4 What is this process (in question 3.3.3) called? (1 × 2) (2)
- 3.3.5 What is the form of the settlement at A? (1 × 2) (2)
- 3.3.6 Explain one disadvantage and one advantage that the type of settlement and farming practice at B holds for these farmers. (2 × 2) (4)
- 3.3.7 Name the settlement pattern at C. (1 × 2) (2)

[18]

3.4 Read the text and study Figure 3.4, which shows the sources of water supply in the Western Cape. Then answer the questions that follow.

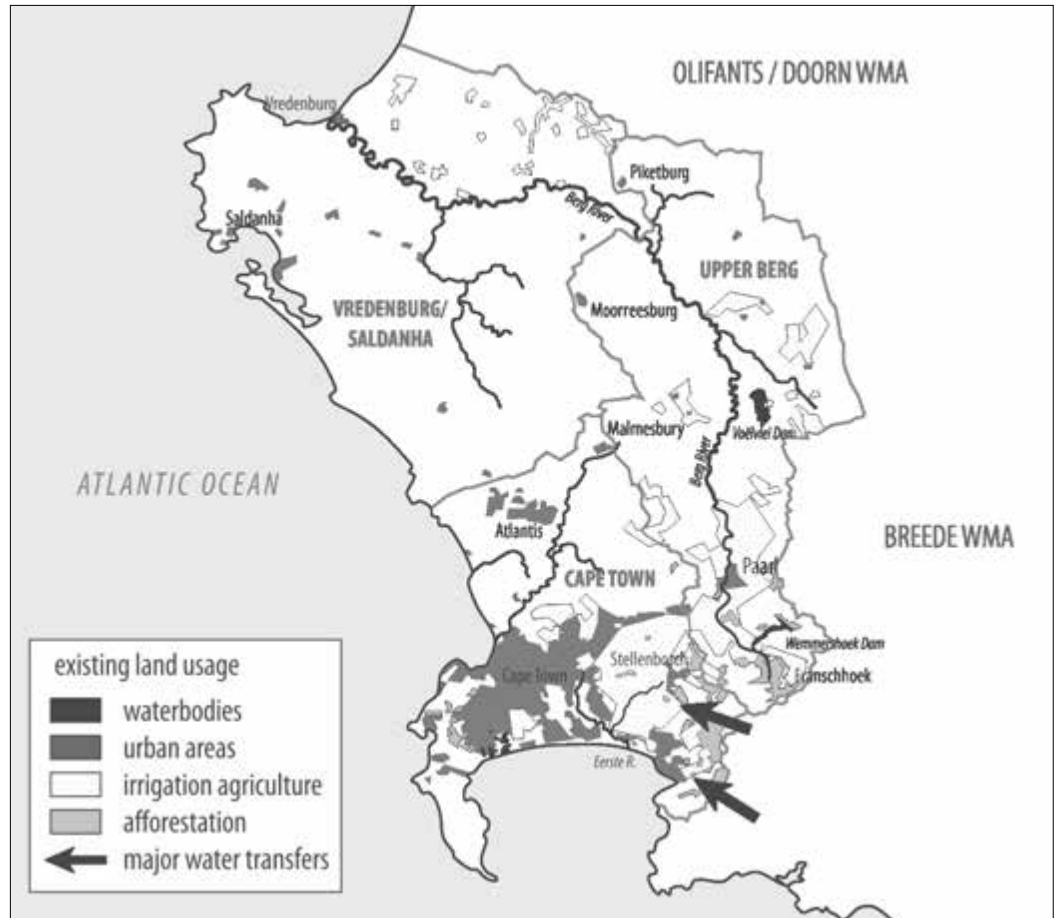


Figure 3.4 Sources of water supply in the Western Cape

### The sources of water supply in the Western Cape

The future of the Western Cape Province rests largely on the sustainable development and use of water reserves, including the Berg River. The Western Cape has the third largest economy in South Africa. With 10% of the country's population, the Western Cape contributes 14% to the GDP. Eight per cent (8%) of the population in the Berg River Control Area still does not have access to running tap water. Irrigation farming, viticulture and grapes, and the deciduous fruit export industry are some of the most important activities in this area. A population of almost 3,5 million in a variety of rural and urban areas is also dependent on the water.

- 3.4.1 Where is the source of the Berg River? (1 × 2) (2)
- 3.4.2 Name two groups of users in the South Western Cape who are dependent on water from the Berg River Scheme. (2 × 2) (4)
- 3.4.3 How does Cape Town benefit from the Berg River's water through inter-basin displacement? (2 × 2) (4)
- 3.4.4 Apart from fruit, name another agricultural product that is irrigated from the Berg River. (1 × 2) (2)
- 3.4.5 Who owns the water in the Berg River? (1 × 2) (2)
- 3.4.6 The wide range of human activities in the Western Cape plays an important role in the development of this industrial region. Name two factors that benefit this region. (2 × 2) (4)
- 3.4.7 Explain the abbreviation GDP. (1 × 2) (2)

- 3.4.8 Explain the possible circumstances that are the cause of 8% of the region's population still not having access to running tap water. (2 × 2) (4)
- 3.4.9 What development plan has the democratic government put in place since 1994 to eradicate such social inequalities? (1 × 2) (2)
- [26]  
[75]

**Question 4**

4.1 Study Figure 4.1. Then answer the multiple-choice questions by writing down only the number of the correct answer next to the question number, e.g. 4.1.1:F.

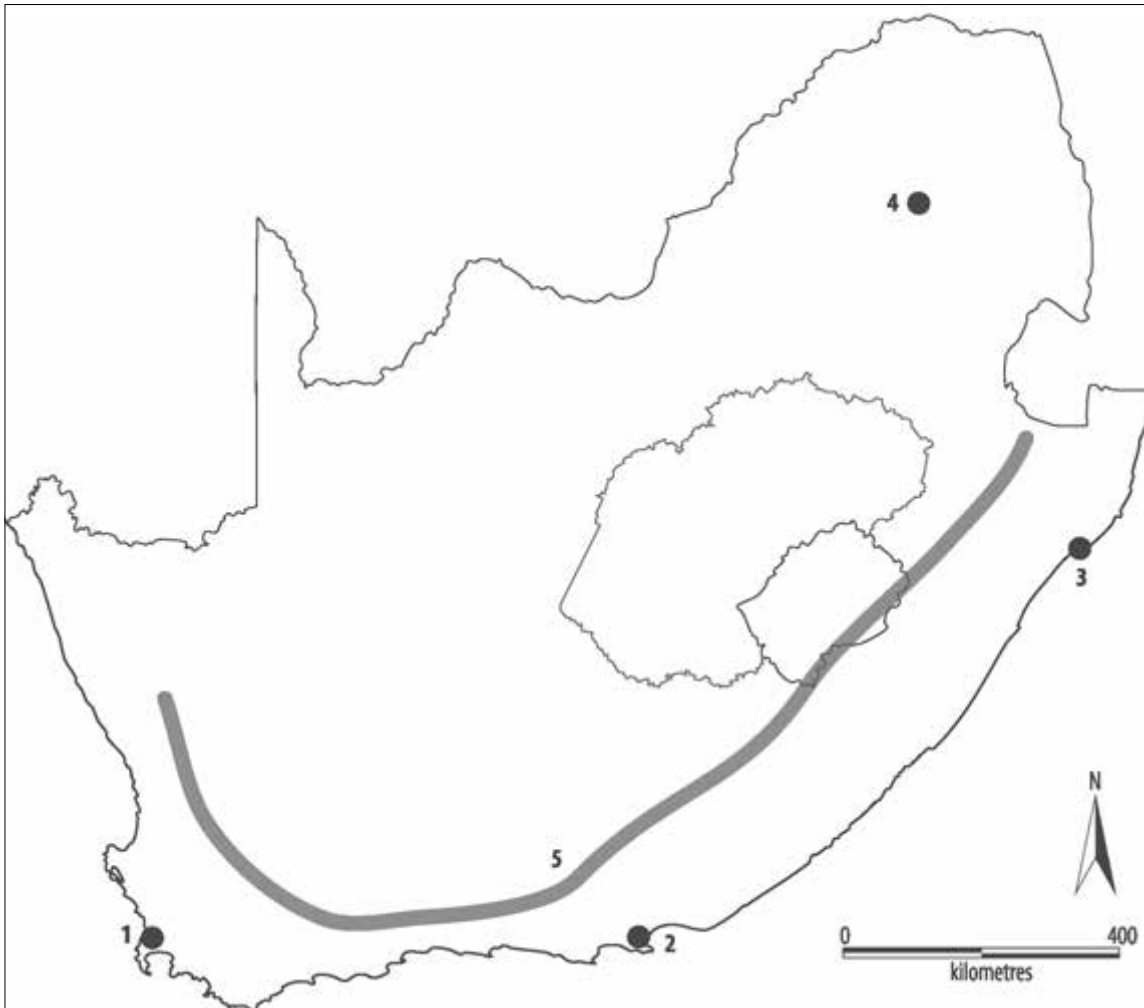


Figure 4.1 Map of South Africa

4.1.1 The largest industrial centre in South Africa is found at:

- A. 4
- B. 3
- C. 2
- D. 1

4.1.2 The area in South Africa with the highest annual rainfall is at:

- A. 1
- B. 2
- C. 3
- D. 4

- 4.1.3 The area that most frequently experiences frost is:
- A. 1
  - B. 2
  - C. 3
  - D. 4
- 4.1.4 The relief phenomenon at no. 5 is called:
- A. coastal plain
  - B. escarpment
  - C. plateau
  - D. Little Karoo
- 4.1.5 Desertification is occurring increasingly and it is mainly due to:
- A. the growing use of wood and shrubs for agricultural purposes and firewood
  - B. over-grazing
  - C. annually decreasing rainfall
  - D. contamination and infestation from invasive vegetation
- 4.1.6 Which statement is not correct?
- A. The balance of payments has to do with the payment obligations that arise when a country imports or exports goods.
  - B. The workforce of South Africa is the economically active population.
  - C. The GNI is the total value of all goods and services produced in one country in one year.
  - D. Quaternary activities consist of management activities in order to lead the country. (6 × 1) (6)
- 4.1.7 Write down the question number and only TRUE or FALSE.
- A. Decentralisation involves the relocation of industries and economic activities away from core areas.
  - B. Globalisation involves economic, political and cultural relations across borders.
  - C. Food security means that all the people in the country have food to eat.
  - D. Episodic rivers flow only during the rainy season. (4 × 1) (4)

4.1.8 Study Figure 4.2 Then answer the question that follow.

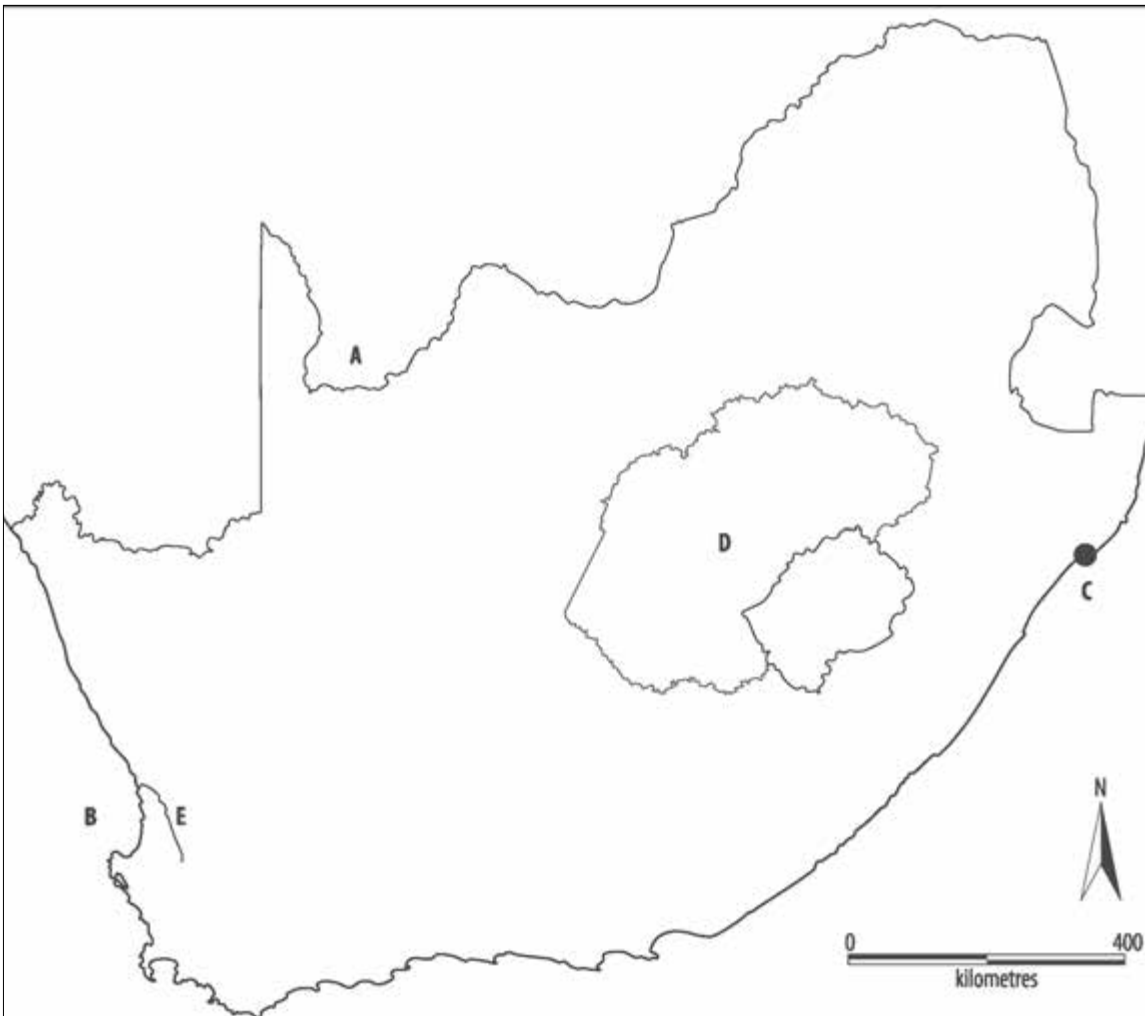


Figure 4.2 South Africa and its neighbouring states

- (a) Identify South Africa's neighbouring state marked A.
- (b) Identify the ocean marked B.
- (c) Identify the main export product at the port marked C.
- (d) Identify the capital of the province marked D.
- (e) Identify the river marked E.

(5 × 1) (5)  
[15]

4.2 Study Figure 4.3. Then answer the questions that follow.

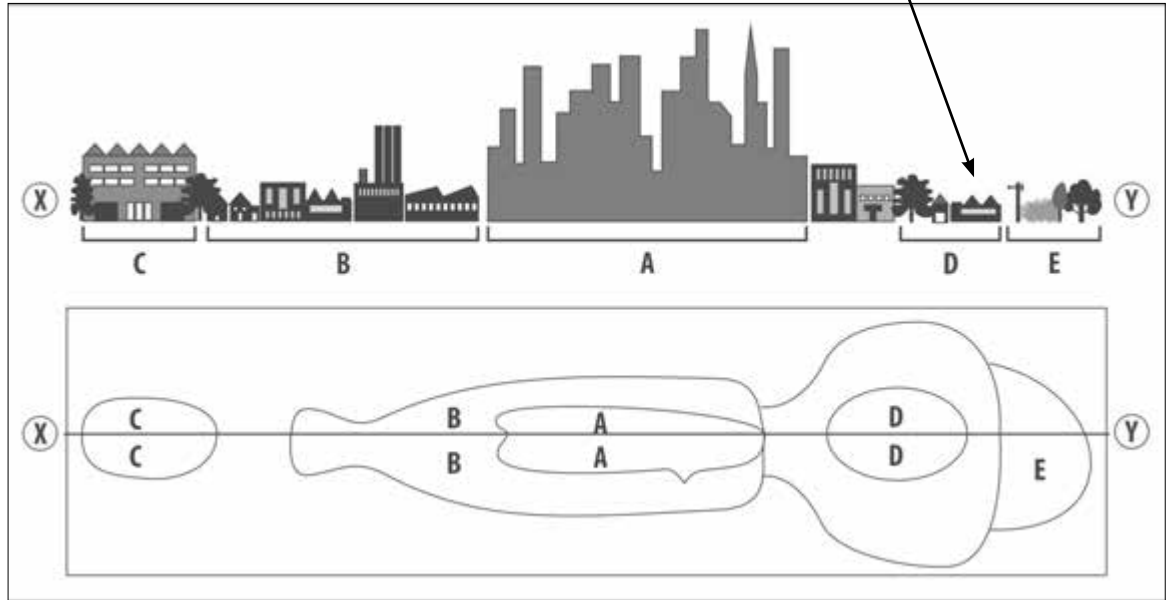


Figure 4.3 City profile and land use zones

- 4.2.1 Name the land use zone with the highest site values. (1 × 2) (2)
- 4.2.2 A new shopping centre is being built at C. What could the reasons be for building this shopping centre? Name TWO reasons. (2 × 2) (4)
- 4.2.3 List one function that will be found in the rural-urban transition zone. Explain why this function will select its location in this zone. (2 × 2) (4)
- 4.2.4 What type of housing is typical of the residential areas at D? (1 × 2) (2)
- 4.2.5 Urban decay is a feature of the older parts of A. Write a short essay (10–12 lines) describing the causes of urban decay in this area, and suggest measures as to how these degraded areas could be renewed. (5 × 2) (10)



- 4.2.6 Transport problems in cities are becoming a growing problem. Study the text below on the Gautrain. Then answer the questions that follow.

## Gautrain rollout to start in 2004

11 AUGUST 2003

CONSTRUCTION work on the Gautrain rapid rail link between Johannesburg, Pretoria (Tshwane) and the Johannesburg International Airport, is due to begin next June. The state-of-the-art train is likely to be operational within five years to link Johannesburg and Pretoria in less than 35 minutes at speeds of 160 km/h or higher.

There will be initially six trains per hour per direction, and more trains will be added as the threshold population of passengers using the system increases. It is estimated that three million cars drive on the M1 between Johannesburg and Pretoria during peak periods. About 400 000 cars pass along the highway each hour at very low speeds.

- (a) What was the main purpose of constructing the Gautrain? (1 × 2) (2)
- (b) Are taxis/ car hire and the Gautrain aimed at the same target market? Explain your answer. (2 × 2) (4)
- (c) What is the role of taxis in the economy of our country? (1 × 2) (2)
- [30]

- 4.3 Read the advertising leaflet about Coega. Then answer the questions that follow.

### Hong Kong, Singapore, Dubai... Now Coega

Anyone who knows anything about international trade will tell you that Hong Kong, Singapore and Dubai are among the world's largest ports. South Africa will soon be part of this powerful group thanks to the benefits available at the 12 000-hectare Coega Industrial Development Zone near Port Elizabeth.

It's the ideal location for export orientated industries. For a start, there are no import duties so manufacturers can bring new materials in at lowest cost. And because there are no export duties, they can send beneficiated goods out at the keenest prices.

Transport costs are minimised too, because Coega is right next door to South Africa's new deep water port where state-of-the-art container handling will speed up distribution. The proven combination of a duty-free industrial zone, purpose-built modern port and ready access to the rest of the world will result in competitive advantages for exporters. Not to mention economic benefits for the people of the Eastern Cape or international trading opportunities for the entire subcontinent. Welcome Coega.

Visit [www.coega.com](http://www.coega.com) for further information.

- 4.3.1 Why is international trade important to South Africa? (1 × 2) (2)
- 4.3.2 What connection can be made/ resemblance is there between Coega, Hong Kong, Singapore and Dubai? (1 × 2) (2)
- 4.3.3 What is meant by IDZ? (1 × 2) (2)

- 4.3.4 Name two incentive measures that will be relevant at Coega to help its economic growth. (2 × 2) (4)
  - 4.3.5 What is 'containerisation'? (1 × 2) (2)
  - 4.3.6 How has 'containerisation' benefitted the transportation industry? (1 × 2) (2)
  - 4.3.7 Describe one social factor that could harm the development of the Coega region. (1 × 2) (2)
  - 4.3.8 What is the main export product handled at Coega? (1 × 2) (2)
  - 4.3.9 Coega harbour can be regarded as part of the (primary/secondary/tertiary/quaternary) industry. (1 × 2) (2)
- [20]

4.4 Read the text below, which explains a land reform project. Then answer the questions that follow.

**Qedusizi-Bester land reform project in KwaZulu-Natal, near Ladysmith**

The project includes 14 hectares of agricultural land purchased for crop cultivation and animal husbandry. By June 2006, R7,4 million had been spent – mostly for buying 839 cattle. Some of the money was used for creating employment to ensure long-term economic stability, for example for members of the community to help manufacture and operate 11 water carts.

- 4.4.1 What does the term 'land reform' mean? (1 × 2) (2)
  - 4.4.2 What type of farming would the members of the Qedusizi tribe have practised before this land reform took place? (1 × 2) (2)
  - 4.4.3 What contribution, do you think, the Qedusizi tribe had previously made to the agricultural sector? (1 × 2) (2)
  - 4.4.4 What problems face these new farmers? (2 × 2) (4)
- [10]  
[75]

**Paper 1 total: 225 marks**

**INSTRUCTIONS AND INFORMATION**

Answer all the questions in this paper.  
Together, they are worth 75 marks.

**Question 1**

The following questions are based on the topographical map 2530BD Nelspruit on page 233.

1.1 The sketch map in Figure 1.1 below is a reduced representation of the topographic map extract. Look carefully at the sketch map, and then answer the questions that follow.

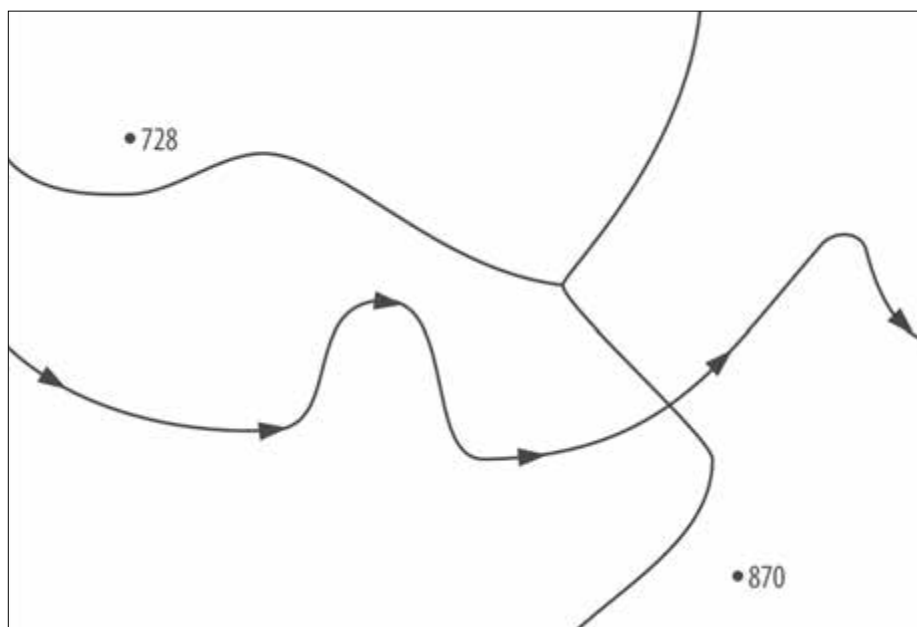


Figure 1.1 Sketch map of topographic map 2530BD Nelspruit

Show the following on the sketch map.

- 1.1.1 The settlement Nelspruit. (Shade the area covered by Nelspruit.)
- 1.1.2 The sewage disposal works (mark with an X).
- 1.1.3 The N4 (draw in RED). (3 × 1) (3)
- 1.2 Give the coordinates of •842 (B1). (4 × 1) (4)
- 1.3 Identify the land usage around •776 (D1). (2)
- 1.4 Calculate the average gradient from •842 (B1) to •776 (D1).  
Show all your calculations. (3 × 2) (6)
- 1.5 Calculate the distance by road (N4) from the crossing in E3 to  
Kaapmuiden. Show all calculations. (2 × 2) (4)
- 1.6 In which direction is the Crocodile River flowing? (1)
- 1.7 Identify the channel pattern of the Crocodile River. (2)
- 1.8 Withdrawal of water from the river resulted in a reduced  
drainage in the river.
- 1.8.1 Identify two uses of this water. (2 × 2) (4)

- 1.8.2 Describe the impact of a reduced drainage on the characteristics of the flow of the river. (2 × 2) (4)
- 1.9 Find the farm Mataffin in E1. In this area 15 000 ha of land was given back to the local community as part of the land reform programme.
- 1.9.1 To give back the land was the first step. What else had to happen to ensure that the land reform process was successful? (2)
- 1.9.2 In this area a new soccer stadium – Mbombela Soccer Stadium – was built for the World Cup Soccer Tournament. Name two advantages that building this stadium had for this area. (2 × 1) (2)
- [34]

### Question 2

The following questions are based on the topographic map 2829AC Harrismith (page 234) and the orthographic map of the area (page 235).

- 2.1 What is the height of the highest point on the map? (1)
- 2.2 Calculate the area marked B on the orthographic map. Show all your calculations. (3 × 2) (6)
- 2.3 You are walking from •1786 (G4) to 298 (H3). Draw a freehand cross-section of the area where you are walking. On the cross-section, mark (with an X) where you will cross the gravel road. (3 × 1) (3)
- 2.4 What will the bearing of this planned hike be? (2)
- 2.5 Your hike includes an overnight camp, in the valley of the non-perennial stream in H3. Just before sunrise, you make a fire to make coffee. It is a clear winter's morning. In which direction will the smoke move? Give a reason for your answer. (2 × 2) (4)
- 2.6 Identify one tertiary activity that happens in block B on the orthographic map. (1)
- 2.7 Identify the structure marked C on the orthographic map, and determine what it is used for. (1 + 1) (2)
- 2.8 The graphs in Figure 2.1 show the difference in temperature in Harrismith from point G to point H on the orthographic map. Only one graph is correct. Determine which one is the correct graph and explain why. (1 + 2) (3)

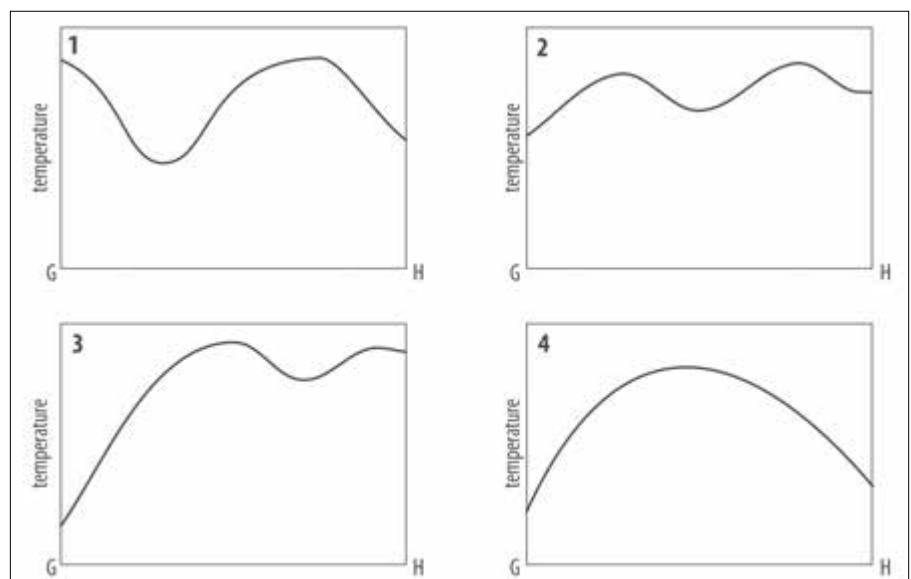


Figure 2.1 Graphs showing temperature in Harrismith from point G to point H

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- 2.9 Compare Nuwejaarspruit from E (A4) to F (A2) with the nameless river that rises at D (H1) towards the end of the map. Distinguish the fluvial characteristics of these two rivers and valleys. Tabulate your answer. (4 × 1) (4)  
[26]

**Question 3**

- 3.1 Why do we use GIS? (2)  
 3.2 Differentiate between vector and raster data. (2)  
 3.3 What is data manipulation? (2)  
 3.4 A lot of data is generated by GIS. This data needs to be updated and well-managed. This is done with the help of meta-data. What is meta-data? (2)  
 3.5 Buffering is often done through GIS. The following is an extract from a GIS data image and shows the sphere of influence of schools in Port St Johns in the Eastern Cape. Imagine that learners are happy to walk a maximum of 3 km to school. Figure 3.1 is a data sheet which shows the 3 km sphere of influence (buffer zones) of local schools in the area.

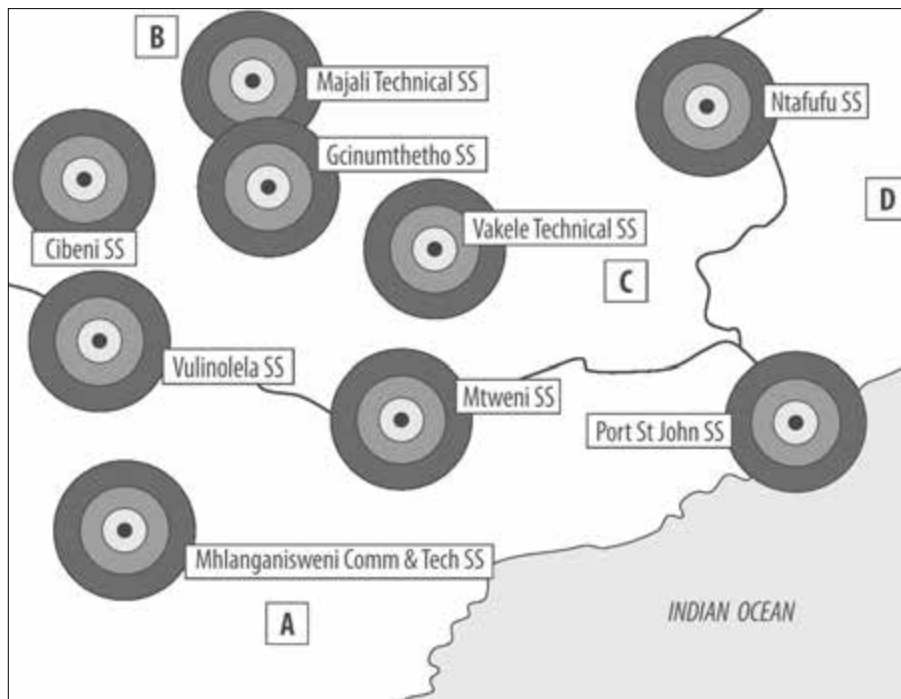
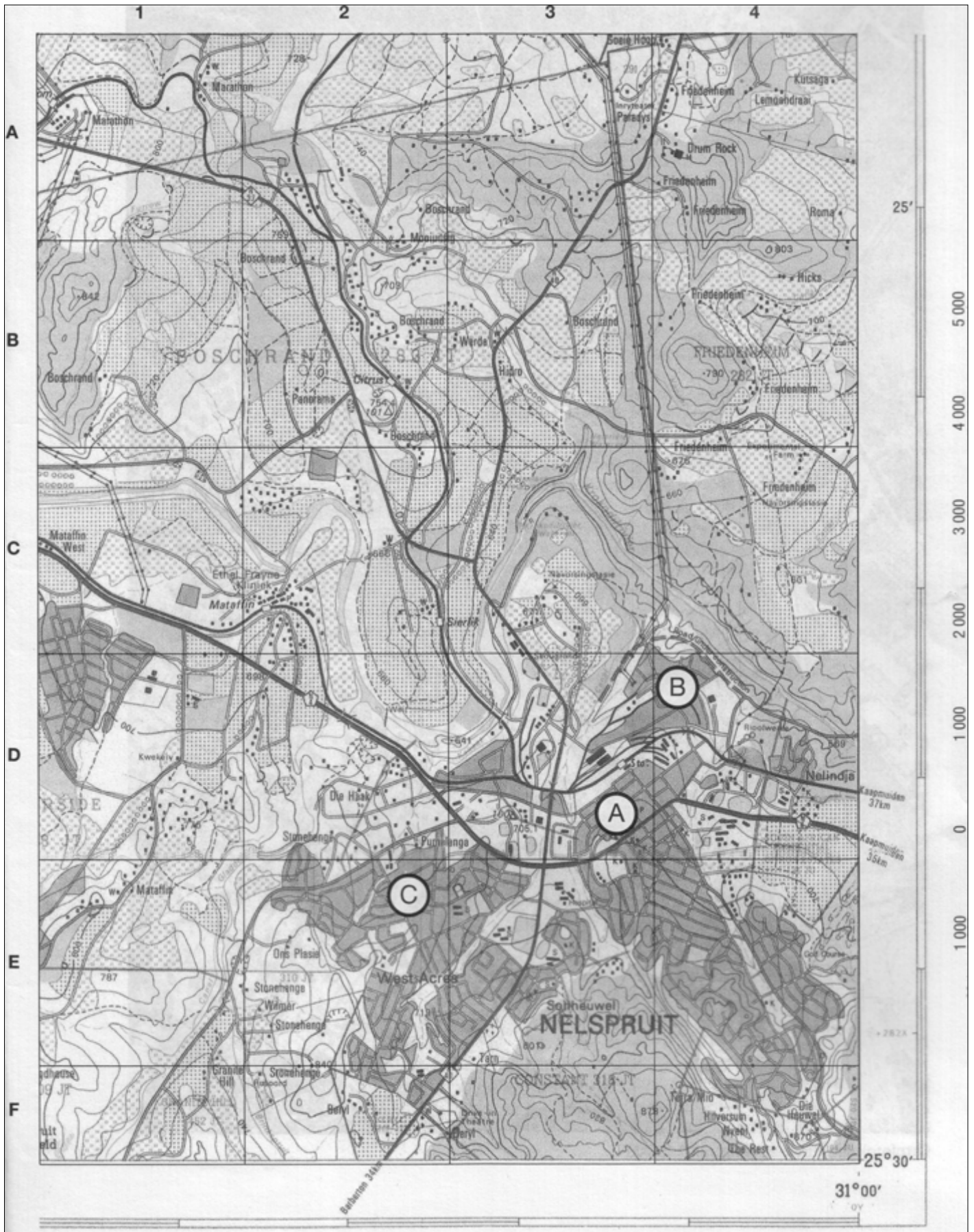


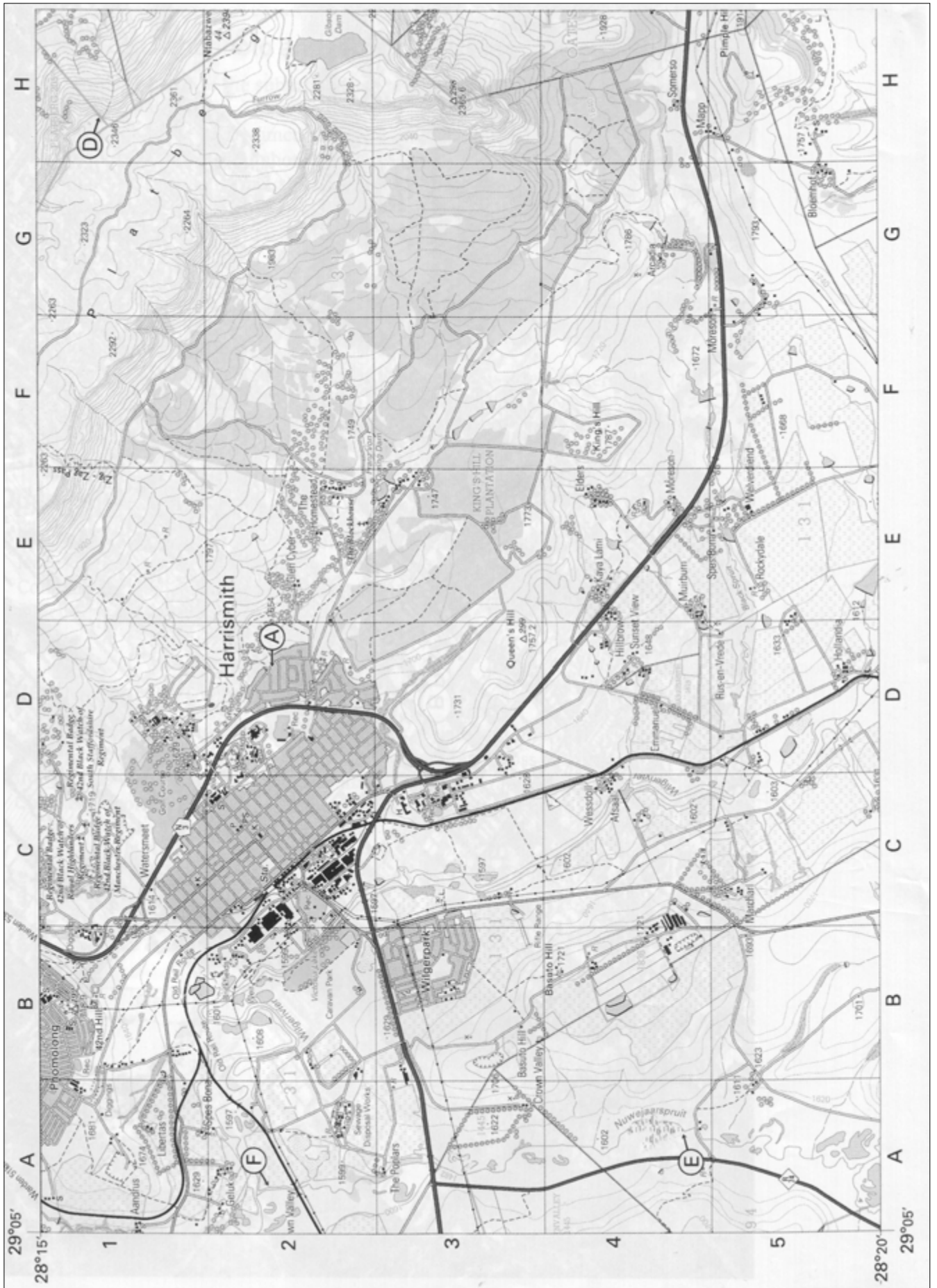
Figure 3.1 Data sheet showing the buffer zones (3 km) of local schools

- 3.5.1 Three shades of grey are used to show the buffer zones. Does the lightest or darkest shading indicate the 3 km buffer? (1)  
 3.5.2 What other information, other than the buffer distances, is indicated on the GIS data sheet? (1 + 1 = 2)  
 3.5.3 Which area (A, B, C or D) has enough schools? (1)  
 3.5.4 What on the data sheet tells us that area D does not really need any schools? (1)  
 3.5.5 Which area/s (A, B and/or C) will most probably need more schools? (1)  
 3.5.6 Explain your answer to question 3.5.5. (1)  
 [15]

**Paper 2 total: 75 marks**



© You may photocopy this page for use with *Study & Master Geography Grade 12*.



© You may photocopy this page for use with *Study & Master Geography Grade 12*.



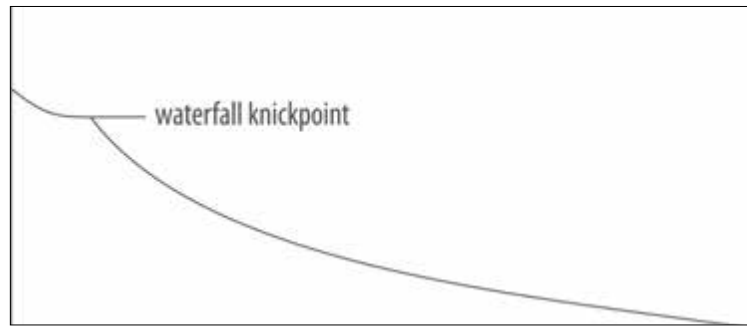
© You may photocopy this page for use with *Study & Master Geography Grade 12*.



**Question 1**

- 1.1.1 D  
 1.1.2 D  
 1.1.3 C  
 1.1.4 C  
 1.1.5 C  
 1.1.6 A  
 1.1.7 C  
 1.1.8 B  
 1.1.9 A  
 1.1.10 B  
 1.1.11 A  
 1.1.12 A  
 1.1.13 C  
 1.1.14 C  
 1.1.15 A (15 × 1)  
 [15]
- 1.2.1 pollution dome (2)  
 1.2.2 A – warmer; REASON: warm air is pushed down by cold descending air.  
 B – colder; REASON: cold air descends from upper air. (2 × (1 + 2)) (6)  
 1.2.3 pollution from vehicles; combustion processes in industries; excessive heat absorption by concrete and buildings (1 × 2) (2)  
 1.2.4 Pollution dome will be higher during the day – warm air rises higher during the day/ cold air descends less. At night it will be lower – cold air descends stronger, less warm air that rises – no sunshine (2 × 2) (4)  
 [14]
- 1.3.1 increases systematically until highest point before the eye; then no heavy rain after eye; thereafter a gradual decrease (1 × 2) (2)  
 1.3.2 212 km/h (1 × 2) (2)  
 1.3.3 opposite direction (1 × 2) (2)  
 1.3.4 920 mb (1 × 2) (2)  
 1.3.5 eye – centre of tropical cyclone (2 × 2) (4)  
 1.3.6 B – closest to edge of eye; storm at its heaviest; A – in eye no activity; C – outside spiral rainbands (2 × 2) (4)  
 [16]
- 1.4.1 braided stream (1 × 2) (2)  
 1.4.2 temporary obstruction in process of erosion (1 × 2) (2)

1.4.3



(2 × 1) (2)

1.4.4 no, knickpoint still in profile

(2 × 2) (4)

1.4.5 erosion has started again

(2)

1.4.6 1. peak/crest; 2. cliff/vertical cliff; 3. talus/talus slope

(3 × 2) (6)

1.4.7 no. 1/peak

(2)

1.4.8

Day:

- valley winds/anabatic
- warm air rises at slopes

Night:

- berg wind/katabatic
- cold air descends along slopes

Agriculture:

- frost and cold at X
- avoid crop cultivation, except for crops that are resistant to frost
- fans/waves to avoid frost – in the morning in the valley
- will be needed as windbreakers/row of trees

(5 × 2) (10)

### Question 2

2.1.1 A

2.1.2 D

2.1.3 C

2.1.4 C

2.1.5 D

2.1.6 C

2.1.7 C

(7 × 1) (7)

2.2.1 F

2.2.2 C

2.2.3 J

2.2.4 A

2.2.5 B

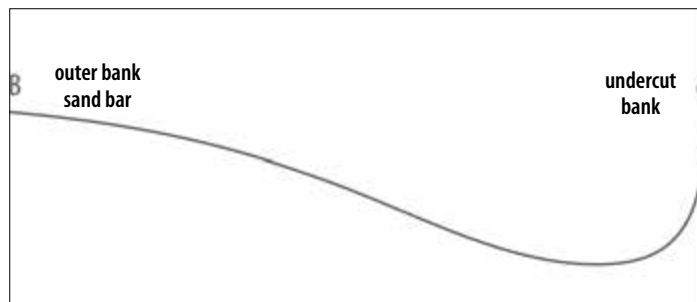
2.2.6 D

2.2.7 H

2.2.8 G

(8 × 1) (8)

- 2.3.1
- swamp – poor drainage over even gradient
  - rocks low in porosity
  - in lower course/reach of river
  - deranged drainage pattern
  - swampy and typical vegetation (1 × 2) (2)
- 2.3.2
- silt goes into river
  - pure / filter stream volume
  - control floods
  - habitat of different species
  - control erosion (1 × 2) (2)
- 2.3.3
- (a) cumecs
- (b) Y – reaches highest level / most water ✓✓ (2 × 2) (4)
- (c) Y (1 × 2) (2)
- 2.3.4 oxbow lake (with water) / meandering course  
(without water) – river changes its flow, cut off  
old meander (2 × 2) (4)
- 2.3.5



(2 × 2) (4)  
[20]

- 2.4.1 dominant H cells; dominant L cells (2 × 2) (4)
- 2.4.2 summer
- subtropical zone moves southwards
  - L becomes prominent because of high temperatures (2 × 2) (4)
- 2.4.3 thunderstorms appear all along  
one zone/line (1 × 2) (2)  
[10]
- 2.5.1 warmer against slopes/higher than valley (1 × 2) (2)
- 2.5.2 cold, descending; air at night catches warm air and smoke  
in between valley/avoid warm polluted air to rise/  
condensation which forms fog/visible as a cloud of smoke (1 × 2) (2)
- 2.5.3 low-income (1 × 2) (2)
- 2.5.4 urban activities result in artificial heat/heat is released  
by industries, motors and combustion processes/ concrete  
absorbs heat from the Sun/reflection through glass  
and zinc (1 × 2) (2)
- 2.5.5 Vaal Hart's irrigation scheme (1 × 2) (2)  
[10]

- 2.6.1 B – ridge  
C – warm front (2 × 2) (4)
- 2.6.2 South Indian anticyclone (1 × 2) (2)
- 2.6.3 descending air  
anticlockwise (2 × 2) (4)
- 2.6.4 subtropical anticyclone (1 × 2) (2)
- 2.6.5 mid-latitude cyclone  
Moves from west to east (2 × 2) (4)
- 2.6.6 summer/high maximum temperature/cold front  
moves along south of land/predict rain onshore/  
high dew point temperature (2 × 2) (4)
- [20]

### Question 3

3.1.1

A = isolated farm

B = conurbation

C = megalopolis

D = metropolis

(4 × 1) (4)

3.1.2 (a) stand/plot

(b) service area/sphere of influence

(c) commercial/commercial farmer

(d) high order

(e) quaternary

(5 × 1) (5)

3.1.3 (a) C

(b) D

(c) B

(d) B

(e) D

(f) B

(6 × 1) (6)

[15]

3.2.1 this is the land/natural environment which a city needs to  
absorb its urban waste/which absorbs the city's CO<sub>2</sub>/use/  
convert/clean up air in city (1 × 2) (2)

3.2.2 (a) little space therefore few gardens/plants in city/  
gardens on roofs will help with absorption of CO<sub>2</sub> (1 × 2) (2)

(b) warmer/dirtier/more impurities because of pollution (2 × 2) (4)

(c) CBD (2)

(d) gardens/parks/green zones/golf courses/reserves  
in and around the city (1 × 2) (2)

[12]

3.3.1 even soil/close to river/NE (north east) – slope of  
mountain range (1 × 2) (2)

3.3.2 lack of knowledge/be at the mercy of natural disasters/  
no capital/etc. (1 × 2) (2)

3.3.3 poverty/natural disasters/no work/poor services/  
social needs/better schools/security/etc. (2 × 2) (4)

3.3.4 urbanisation/depopulation of the rural areas (1 × 2) (2)

3.3.5 T-shaped/gateway town (1 × 2) (2)

3.3.6	Advantages: security / share implements / share knowledge Disadvantages: no innovation / no privacy / wait one's turn	(2 × 2) (4)
3.3.7	scattered	(1 × 2) (2)
		[18]
3.4.1	mountains at Franschhoek	(1 × 2) (2)
3.4.2	agriculture (irrigation / viniculture / fruit) industries residential	(2 × 2) (4)
3.4.3	Cape Town – high population and industries – need a lot of water / low rainfall – need additional water / rain water from mountain area – moved to city bowl	(2 × 2) (4)
3.4.4	rooibos tea, wheat, potatoes	(1 × 2) (2)
3.4.5	everyone	(1 × 2) (2)
3.4.6	<ul style="list-style-type: none"> <li>• lots of cheap labour</li> <li>• location of harbour – contact with outside world</li> <li>• good harbour infrastructure</li> <li>• a differentiation of agri-products as raw materials</li> </ul>	(2 × 2) (4)
3.4.7	Gross Domestic Product	(1 × 2) (2)
3.4.8	<ul style="list-style-type: none"> <li>• large population</li> <li>• poverty</li> <li>• many people still in poor, rural areas</li> <li>• poor infrastructure</li> <li>• poor / absent / corrupt local authorities</li> <li>• growing influx of population, from Eastern Cape for example</li> </ul>	(2 × 2) (4)
3.4.9	RDP – Reconstruction and Development Programme	(1 × 2) (2)
		[26]

#### Question 4

4.1.1	A	
4.1.2	C	
4.1.3	D	
4.1.4	B	
4.1.5	B	
4.1.6	C	(6 × 1) (6)
4.1.7	(a) True (b) True (c) False (d) False	(4 × 1) (4)
4.1.8	(a) Botswana (b) Atlantic Ocean (c) coal (d) Bloemfontein (e) Berg River	(5 × 1) (5)
		[15]
4.2.1	A / CBD / core of urban area / Central Business District	(1 × 2) (2)
4.2.2	decentralisation / move out of CBD / closer to clients / cheaper land / more parking space / easier to access	(2 × 2) (4)
4.2.3	airport – lots of space / safer / less noise prison – far from people / afraid of escaping / big space recreational golf course – large and cheap land / peaceful Accept anything suitable	(2 × 2) (4)

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

- 4.2.4 'gated housing'/townhouse complex/safety parks (1 × 2) (2)
- 4.2.5 Causes:
- buildings old – owners do not care
  - buildings will be demolished anyway
  - depopulation of functions within CBD – buildings not in use
  - no work and the resulting poverty
  - lack of housing – street people sleep here
- Renewal measures:
- new facades for buildings
  - policing
  - fine owners of poorly maintained buildings
  - replan the CBD
  - social help to the poor (5 × 2) (10)
- 4.2.6 (a) quick access between airport and Johannesburg and Pretoria (1 × 2) (2)
- (b) No; taxi's market is low-income workers from Soweto  
Gautrain's market is higher-income airport passengers (2 × 2) (4)
- (c) • taxis provide important transport service  
• people without vehicles can travel  
• workers are at work in good time  
• quicker than pedestrians/bicycles/horse cart  
• pay tax, motor registration  
• increase pressure on roads  
• lots of people die – labour force and families suffer (1 × 2) (2)
- [30]
- 4.3.1 sell products/trade links/earn foreign exchange/outlet for raw materials/etc. (1 × 2) (2)
- 4.3.2 Dubai, Hong Kong and Singapore also seaports which join countries/continents with the rest of the world by sea (1 × 2) (2)
- 4.3.3 Industrial Development Zone (1 × 2) (2)
- 4.3.4 • no import tax  
• no export tax  
• tax-free industrial area  
• good, modern harbour (2 × 2) (4)
- 4.3.5 standard containers for ships/easy and secure packaging/fit on ship and train and plane/less handling of cargo/simplify packaging and shipment of products (1 × 2) (2)
- 4.3.6 same container – from train to ship in harbour handled by cranes directly on train/trucks/standardisation of transportation/quicker/less damage/less manual labour (1 × 2) (2)
- 4.3.7 poverty  
unskilled workers  
people are still tradition-bound/cultural rules (1 × 2) (2)
- 4.3.8 wool/motors (already mounted in fabrics) (1 × 2) (2)
- 4.3.9 tertiary (1 × 2) (2)
- [20]

- 4.4.1 land is used for something else/new farmers get the opportunity to farm (1 × 2) (2)
- 4.4.2 subsistence farming (1 × 2) (2)
- 4.4.3 none – provided for own needs (1 × 2) (2)
- 4.4.4
- learn to plan and save up
  - learn about farming with cattle, diseases of cattle, etc.
  - marketing
  - buy, take care of and handle implements
  - pay tax (2 × 2) (4)

[10]

[75]

**Paper 1 total: 225 marks**

**Question 1**

1.1 Learners should show the following on Figure 1.1: (3 × 1) (3)

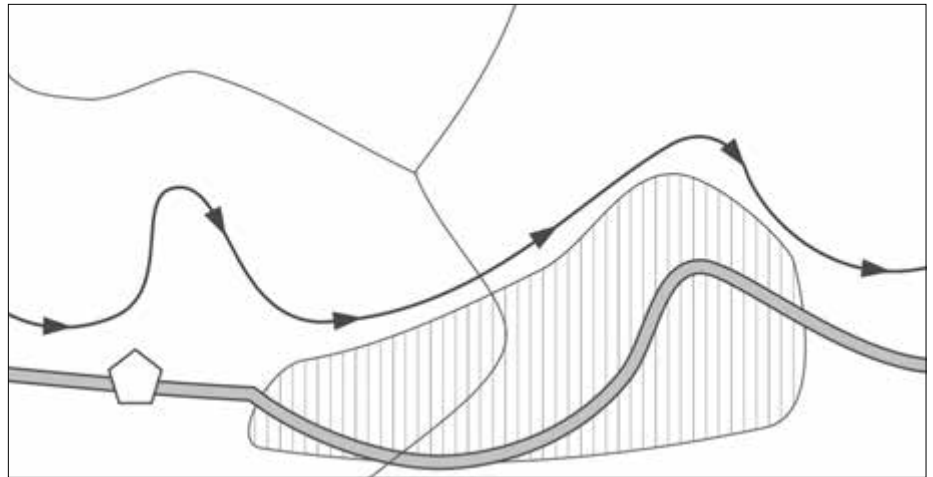


Figure 1.1 Sketch map of topographic map 2530BD Nelspruit

1.2 ( $25^{\circ}25'25''S$ ;  $30^{\circ}55'30''E$ ) (4 × 1) (4)

1.3 cultivated land/ fields (2)

1.4 Gradient = VI

$$= 842$$

$$= 776$$

$$= 66 \text{ m}$$

$$\text{HD} = 105 \text{ mm}$$

$$= 10,5 \text{ cm} \times 0,5 \text{ km}$$

$$= 5,25 \text{ km}$$

$$= 5\,250 \text{ m}$$

$$\text{GR} = \frac{66}{5\,250} \text{ m}$$

$$= \frac{1}{80}$$

$$\therefore 1:80$$

(3 × 2) (6)

1.5  $\text{TD} = \text{MD} \times \text{MS}$

$$= 70 \times 50\,000 \text{ mm}$$

$$= 3,5 \text{ km} + 35 \text{ km}$$

$$= 38,5 \text{ km}$$

(2 × 2) (4)

1.6 west to east/ eastwards (1)

1.7 meander (1 × 2) (2)

1.8.1 farming/ domestic/ industries (2 × 2) (4)

1.8.2 volume less – speed reduces

less erosion – more sediment (2 × 2) (4)

1.9.1 training/ new skills/ access to capital (1 × 2) (2)

1.9.2 food stalls/ influx of capital (2 × 1) (2)

[34]



**Question 2**

- 2.1 2 394,5 m (1)
- 2.2  $\text{Area} = (L \times S) \times (B \times S)$   
 $= (30 \times 10\,000) \times (50 \times 10\,000) \text{ mm}^2$   
 $= 300 \times 500 \text{ mm}^2$   
 $= 150\,000 \text{ mm}^2$   
 $= 0,15 \text{ km}^2$  (3 × 2) (6)

2.3



- (3 × 1) (3)
- 2.4 41° (2)
- 2.5 south – because of the katabatic wind that will flow downwards from the top of the valley (2 × 2) (4)
- 2.6 police station/post office/place of worship (1)
- 2.7 silos – storing wheat (1 + 1) (2)
- 2.8 graph 4 – pollution dome/heat island (1 + 2) (3)
- 2.9

Nuwejaarspruit	Nameless river
uniform or even profile	concave profile
gentle gradient	steep gradient
middle / lower course/reach	upper course/reach
wide floodplain	no floodplain
oxbow lakes	no oxbow lakes
slow flowing	fast flowing
laminar flow	turbulent flow

(4 × 1) (4)  
 [26]

**Question 3**

- 3.1 It makes it possible for us to analyse data and to identify patterns, tendencies, and the relationship between information. (2)
- 3.2 vector: points, lines and polygons (2)  
 raster: pictures; images (2)
- 3.3 When we manage data for a reason and to change it to suit us (for our own purposes). (2)
- 3.4 Information about your data, e.g. when it was consolidated and by whom (2)
- 3.5.1 darkest shading/outside circle (1)
- 3.5.2 provincial borders/roads (1 + 1) (2)
- 3.5.3 B (1)
- 3.5.4 few roads – few people (1)
- 3.5.5 C (1)
- 3.5.6 many roads – indicate possibility of many people (1)

[15]  
 [75]

**Paper 2 total: 75 marks**

Learners should answer three questions: one from Section A, one from Section B; and one from either Section A or B.

**Question 1**

1.1.1 G; 1.1.2 K; 1.1.3 P; 1.1.4 M; 1.1.5 H; 1.1.6 A; 1.1.7 R; 1.1.8 D  
1.1.9 I; 1.1.10 L; 1.1.11 C; 1.1.12 E; 1.1.13 Q; 1.1.14 F; 1.1.15 J (15 × 1)  
[15]

1.2.1 1 = occluded stage; 2 = mature stage; 3 = initial stage (3 × 2) (6)  
1.2.2 clockwise (1 × 2) (2)  
1.2.3 South Atlantic; South Indian (2 × 3) (6)  
1.2.4 The pressure belts shift with the thermal equator. The high-pressure cells are further north in winter, which means that the cold fronts that usually pass by in the southern ocean reach South Africa. (2 × 3) (6)  
[20]

1.3.1 radiation fog (1 × 2) (2)  
1.3.2 Early morning, when loss of heat by terrestrial radiation is at a maximum and dew point temperatures are lowest. (2 × 2) (4)  
1.3.3 Above – there is fog rather than frost. (2 × 2) (4)  
1.3.4 This is a temperature inversion. A layer of cold air is trapped under a layer of warmer air. (2 × 2) (4)  
1.3.5 C (1 × 2) (2)  
[16]

1.4.1 Drakensberg Mountains (1 × 2) (2)  
1.4.2 (a) E (1 × 2) (2)  
(b) A (1 × 2) (2)  
(c) E (1 × 2) (2)  
(d) C, D or E (1 × 2) (2)  
1.4.3 A tight bend in the river (meander) that is cut deep into the landscape, i.e. the sides of the winding river are deep and steep. (2 × 2) (4)  
1.4.4 rejuvenation (1 × 2) (2)  
1.4.5 river capture or tectonic uplift (2 × 2) (4)  
1.4.6 No, erosion is downwards/vertical, rather than sideways/lateral and the sides of the meander are too deep. For an oxbow lake to form, the river must be able to flow or break across the neck of the loop. (2 × 2) (4)  
[24]  
[75 marks]

**Question 2**

2.1.1 mid-latitude cyclone  
2.1.2 warm front occlusion  
2.1.3 anticlockwise  
2.1.4 hurricane

2.1.5	eye	
2.1.6	anticyclone	
2.1.7	trough	
2.1.8	downslope	
2.1.9	insolation	
2.1.10	exotic	
2.1.11	rectangular	
2.1.12	turbulent	
2.1.13	transverse	
2.1.14	superimposed	
2.1.15	smaller	(15 × 1)
		[15]
2.2.1	927 hPa	(1 × 2) (2)
2.2.2	round	(1 × 2) (2)
2.2.3	clear and calm	(2 × 2) (4)
2.2.4	25 knots	(1 × 2) (2)
2.2.5	It is an unmanned weather station.	(1 × 2) (2)
2.2.6	clockwise	(1 × 2) (2)
2.2.7	Late January / the second half of summer. High surface sea temperatures; high humidity.	(3 × 2) (6)
2.2.8	five (with names A–E)	(1 × 2) (2)
2.2.9	Any three points: Flooding from heavy rains and/or storm surges and wind damage, all of which can damage or destroy: roads and bridges (cutting people off), electricity and telecommunication links, water pipes and sewage, crops and livestock.	(3 × 2) (6)
2.2.10	(a) local radio	(1 × 2) (2)
	(b) a fisherman, anyone living on or near the coast	(1 × 2) (2)
		[30]
2.3.1	hydrograph	(1 × 2) (2)
2.3.2	the volume of water that passes a particular point every second OR a measure of a river's flow – its speed and volume; cumecs (cubic metres per second)	(2 × 2) (4)
2.3.3	A = permanent; B = periodic; C = episodic	(3 × 2) (6)
2.3.4	A/permanent	(1 × 2) (2)
2.3.5	C/episodic	(1 × 2) (2)
2.3.6	water that collects by infiltration under the surface	(1 × 2) (2)
2.3.7	baseflow	(1 × 2) (2)
		[20]
2.4.1	(a) 2	(1 × 2) (2)
	(b) 1	(1 × 2) (2)
2.4.2	C	(1 × 2) (2)
2.4.3	A river in which the processes of erosion and deposition are in balance.	(1 × 2) (2)
2.4.4	The introduction of a temporary base level, such as a dam.	(1 × 2) (2)
		[10]
		<b>[75 marks]</b>

### Question 3

- 3.1.1 C  
3.1.2 A  
3.1.3 E  
3.1.4 D  
3.1.5 B (5 × 2)  
[10]
- 3.2.1 E  
3.2.2 G  
3.2.3 B  
3.2.4 F  
3.2.5 C (5 × 2)  
[10]
- 3.3.1 line graph (1 × 2) (2)  
(a) 2002 (1 × 2) (2)  
(b) 2010 (1 × 2) (2)  
3.3.3 No official registration necessary; no skills required; no overheads; no rental costs; a wide range of job opportunities; self-supporting (any ONE point explained). (3 × 2) (6)  
3.3.4 Political challenges: Government may insist on registration for tax collecting purposes; needs to create simple way of formalising 'informal' businesses to guarantee the constitutional rights of citizens; needs to use the entrepreneurship available in the informal sector (any ONE point explained). (2 × 2) (4)  
Social challenges: The security and welfare of women in the informal sector needs to be guaranteed; some form of recognition of workers' rights needs to be implemented to guarantee their job security; xenophobic tensions must be avoided; the rights of sick employees must be implemented to guarantee them security (any ONE point explained). (2 × 2) (4)  
Economic challenges: Easier access to credit and loans needs to be made available; workers need to receive an adequate wage; entrepreneurs in the informal sector need business training to help them to manage their business and expand (any ONE point explained). (2 × 2) (4)  
[14]
- 3.4.1 tourism; entertainment; tertiary education; hospitals; museums (any ONE) (1 × 2) (2)  
3.4.2 rural-urban migration; emigration; job opportunities; higher wages; push/pull factors; move to the coast; move to economic 'hubs' (any ONE) (1 × 2) (2)  
3.4.3 The SA land use model has: informal settlements; separation of racial groups that was a former government law still exists because of inertia and cost of moving homes; use of national roads or railway lines, golf courses or canals, to separate racial residential areas (any ONE explained) (1 × 2) (2)  
3.4.4 separation of racial groups; shanty towns; informal settlements (any ONE) (1 × 2) (2)

- 3.4.5 Issues to include: lack of urban planning; housing shortages; delivery failure in services; over-crowding; traffic congestion (6 × 2) (12)
- 3.5.1 A. PWV-Gauteng  
B. Durban-Pinetown  
C. Port Elizabeth-Uitenhage  
D. South Western Cape Metropole (4 × 2) (8)
- 3.5.2 centralised (1 × 2) (2)
- 3.5.3 Creates too much impact on the environment; too much pressure on the supply of labour; limited space for expansion; social unrest may occur if the government cannot keep up with services for the workforce (any THREE explained). (3 × 2) (6)
- 3.5.4 Industrial Development Zones; Spatial Development Initiatives (1 × 2) (2)
- 3.5.5 Mozambique Corridor; Beira Development Corridor; Walvis Bay Development Corridor (any ONE) (1 × 2) (2)
- 3.5.6 Port Elizabeth – Uitenhage (1 × 2) (2)
- [21]  
[75]

#### Question 4

- 4.1.1 higher-order  
4.1.2 residential  
4.1.3 dual cities  
4.1.4 urban decay  
4.1.5 suburbanisation (5 × 2) (10)  
[10]
- 4.2.1 D  
4.2.2 C  
4.2.3 B  
4.2.4 D  
4.2.5 A (5 × 2) (10)  
[10]
- 4.3.1 sector model; South African model (1 × 2) (2)  
4.3.2 suburbanisation (1 × 2) (2)  
4.3.3 Close to residential areas for worker accommodation; space to develop and expand; close to road and rail communication (1 × 2) (2)  
4.3.4 separated by human-made or natural obstacle such as a road or railway from other suburbs; golf course separates it; farmland separates it (1 × 2) (2)  
4.3.5 informal settlements (1 × 2) (2)  
4.3.6 decentralisation and suburbanisation; gentrification; urban decay; invasion and succession; edge cities; gated communities (any TWO) (2 × 2) (4)  
[14]

4.4.1	A	(1 × 2) (2)
4.4.2	Commercial and subsistence agriculture form a dual agriculture.	(1 × 2) (2)
4.4.3	small size of farm; often run by women; women have responsibility for children and the elderly; can't afford to employ labour; can't afford hybrid seeds/pesticides/herbicides; can't afford mechanisation; can't afford irrigation; struggle with access to credit, marketing and distribution (any TWO)	(2 × 2) (4)
4.4.4	commercial farmers; urban and peri-urban agricultural schemes; subsistence farming; government support for farmers and their security; Land Reform and Redistribution Act (any ONE)	(1 × 1) (1)
4.5		
4.5.1	2010	(1 × 2) (2)
4.5.2	2012	(1 × 2) (2)
4.5.3	2011	(1 × 2) (2)
4.5.4	US\$ are international; the World Bank uses US\$; the UN uses US\$	(1 × 2) (2)
4.5.5	the least minerals were mined; the cost of mining was highest; the price received per ounce was lower than 2011; the mine had fewer workers; the mine made a loss	(3 × 2) (6)
	(a) statistics are visual; clear/easy to read; easy to compare figures	(1 × 2) (2)
	(b) statistics can be manipulated; there is no explanation as to how the figures were arrived at	(1 × 2) (2)
4.5.7	work stoppages; world commodity prices; input costs; fuel prices	(2 × 2) (4)
		[22]
4.6.1	one third; 33,3%	(1 × 2) (2)
4.6.2	the discovery of gold	(1 × 2) (2)
4.6.3	Raw materials and minerals e.g. iron, manganese, coal, platinum, gold; water from the Vaal River, the Lesotho Highlands Water scheme, the Tugela-Vaal project; power from thermal power stations in Mpumalanga and Limpopo; large skilled and unskilled labour pool; large domestic and international markets; transport is accessible and good	(3 × 2) (6)
		[10]
		<b>[75 marks]</b>

Learners should answer all questions in this paper.

**Question 1**

- 1.1 B; 1.2 B; 1.3 A; 1.4 C; 1.5 D; 1.6 C; 1.7 C; 1.8 B; 1.9 A;  
1.10. B; 1. 11. E; 1.12 D; 1.13 B; 1.14 D; 1.15 E (15 × 1)  
[15]

**Question 2**

- 2.1.1 1: 250 000 (2)  
2.1.2 smaller (because, as a ratio, it is 1: 250 000 while a topographical map is 1: 50 000. On our scale in the example, 1 cm has to represent 2,5 km, while on a topographical map it only has to represent 500 m. (2)  
2.1.3 Scale 1: 50 000 topographic map (covering 5 km) (2)



- 2.2.1  $1,8 \text{ cm} \times 1 \text{ cm} = (\text{in reality}) 18\,000 \times 10\,000 \text{ cm} = 180\,000\,000 \text{ cm}^2 = 18\,000 \text{ m}^2$  (3)  
2.2.2  $23,3 \text{ cm} \times 17,3 \text{ cm} = 11,65 \text{ km} \times 8,65 \text{ km} = 100,77 \text{ km}^2$  (3)  
2.2.3 True bearing from A to B =  $165^\circ$  (3)  
Add the declination of  $20^\circ 30'$  for an answer of  $185^\circ 30'$   
2.2.4 No, because no information on latitude and longitude is provided. The best would be a grid reference, based on the letters and numbers in the blocks. (3)  
2.2.5  $8,3 \text{ cm} = 83\,000 \text{ cm}$  in reality = 830 m  
 $1\,744 \text{ m} - 1\,540 \text{ m} = 204 \text{ m}$   
Distance is 5,5 cm which is 2 750 m in reality (2)  
[20]

**Question 3**

- 3.1 meandering; incised; mature (3)  
3.2 steep-sloped; incised (2)  
3.3 The area is rural; there are scattered and isolated settlements, but no evidence of a town, or urban planning and development. Farms names such as Four Winds and Summit to the south of the river, and Zulu names to the north of the river. Assisi and Emmanuel Missions suggest European missionaries in Zulu territory. (2)  
3.4.1 H  
3.4.2 I  
3.4.3 D  
3.4.4 F  
3.4.5 A  
3.4.6 E  
3.4.7 B  
3.4.8 C  
3.4.9 J  
3.4.10 G (5)

- 3.5 Mehlomnyama Nature Reserve (1)
- 3.6 Very underdeveloped, rural infrastructure with few roads, and no other evidence of developed transport or communication systems. (2)
- 3.7.1 the map, because it shows contours to differentiate height (2)
- 3.7.2 the map, with possible confirmation from the satellite image; the map shows railways and roads via symbolic lines, the image (magnified) can show the reality (2)
- 3.7.3 the satellite image, because sedimentation shows through the water, and a series of maps over, say, 10 years, will provide visual evidence of changes in sedimentation (2)
- 3.7.4 probably the satellite image, as real features can be identified, sometimes down to the detail of the colour of roofs of buildings (2)
- 3.7.5 true colour; what you see is correct (green for vegetation, blue for water, etc.) (2)
- [25]

#### Question 4

- 4.1 integration of different types of spatial data at different scales, into one rectified (for scale) GIS map (2)
- 4.2 raster data; the blocks contain information (data) rather than simple points, lines, or polygons (2)
- 4.3 A line is a line joining two or more spatially separated points; a polygon is a spatially defined area enclosed by a line. (3)
- 4.4.1 slope; geology; transportation (roads); protected areas; infrastructure (2)
- 4.4.2 transport and infrastructure are human; protected area is a natural area, but defined as protected by humans (1)
- 4.4.3 two (slope, geology) are natural (1)
- 4.5 engineering; urban planning; transport planning; rural development; hazard and disaster management; demarcating protected areas; catchment management; mining and resource management (4)

[15]

[75 marks]



## 4. PHOTOCOPIABLE ASSESSMENT RESOURCES

The following assessment resources may be photocopied for use with *Study & Master Geography* Grade 12:

- Test 1, pages 173–175
- Test 1 Memorandum, page 176
- Test 2, pages 204–206
- Test 2 Memorandum, pages 207–208
- Mid-year examination Paper 1, pages 179–187
- Mid-year examination Paper 1 Memorandum, pages 195–199
- Mid-year examination Paper 2, pages 188–194
- Mid-year examination Paper 2 Memorandum, pages 200–201
- Trial examination Paper 1, pages 209–229
- Trial examination Paper 1 Memorandum, pages 236–242
- Trial examination Paper 2, pages 230–235
- Trial examination Paper 2 Memorandum, pages 243–244

## 5. RECORDING AND REPORTING

The results of all formal assessments should be recorded and are used for reporting on learners' performance each term. The Programme of Assessment (Teacher's Guide page 170) details how the learner's Geography mark for each term is arrived at.

The following photocopiable assessment recording tools are provided on pages 253–256 of this Teacher's Guide:

- Record sheet for formal assessment: Term 1
- Record sheet for formal assessment: Term 2
- Record sheet for formal assessment: Term 3
- Record sheet for formal assessment: Term 4

The following rating codes and descriptors should be used for reporting on the learners' progress in Geography:

Rating code	Description of competence	Percentage
7	Outstanding achievement	80–100
6	Meritorious achievement	70–79
5	Substantial achievement	60–69
4	Adequate achievement	50–59
3	Moderate achievement	40–49
2	Elementary achievement	30–39
1	Not achieved	0–29









## 4. RESOURCES

1. Useful websites	258
2. Photocopiable worksheets	259
3. Answers for photocopiable worksheets	290
4. Lesson plan template	298



## 1. USEFUL WEBSITES

The following websites are suggested for both you and the learners to consult. They contain information and features that would be of general use to you as a teaching tool for Geography Grade 12:

- <http://www.dailymail.co.uk/sciencetech/index.html>
- <http://www.geography4kids.com/index.html>
- <http://gis.com>
- <http://www.google.com/earth/index.html>
- <http://maps.google.co.za>
- <http://www.nasa.gov/home/index.html>
- <http://www.nationalgeographic.com>
- <http://www.un.org/en/development>
- <http://www.weathersa.co.za>

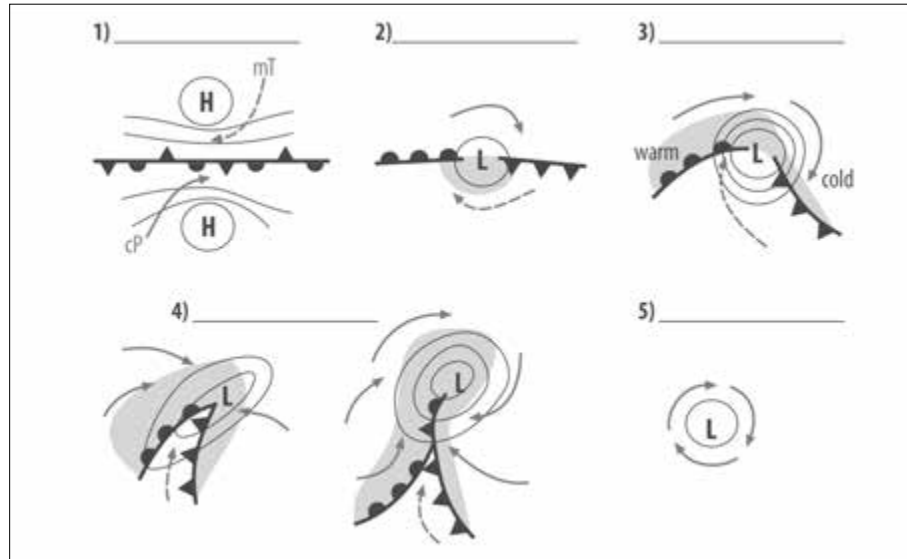
For website information that links specifically to the content of each module and unit, please consult the 'Resources' section of the lessons in the 'Lesson-by-lesson' section of this Teacher's Guide (pages 19–168).

	<b>2. PHOTOCOPIABLE WORKSHEETS</b>	

The following worksheets (pages 260–289) may be photocopied for use with *Study & Master Geography* Grade 12. The remedial worksheets can also be used for revision purposes. Answers for the photocopiable worksheets are provided on pages 290–297 of this section.








1. Identify stages 1–5. (Fill them in on the artwork.)



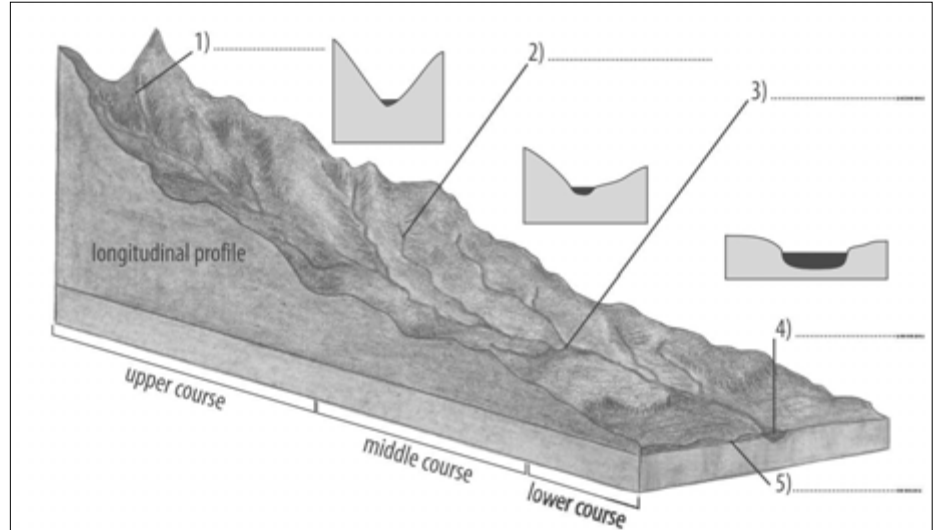
2. Match the descriptions a–e to the correct stage by fill in the numbers 1–5 below:

- The polar front divides into a cold front and a warm front. \_\_\_\_\_
- All warm air is lifted off the ground. \_\_\_\_\_
- The cold air begins to overtake the warm front, lifting warm air off the ground. \_\_\_\_\_
- A stationary polar front forms with wind shear. \_\_\_\_\_
- A wave forms in the polar front as warm air lifts up over cold air. \_\_\_\_\_

3. Identify the different types of fronts by filling in the missing words below.

-  stationary front
-  a. \_\_\_\_\_
- \_\_\_\_\_ isobar
-  b. \_\_\_\_\_
-  c. \_\_\_\_\_
-  precipitation

- 1. Fill in features 1–5 on the artwork: tributary, confluence, base level, source, river mouth.



- 2. Select the correct term:
  - a. Walking along the bank of a river, you follow its (transverse/longitudinal) profile.
  - b. Wading across the river, from one side to the other, you follow its (transverse/longitudinal) profile.
- 3. Describe the difference between the transverse profile of a river in the upper course and lower course. Give reasons for the difference.

---

---

---

---

---

---

---

---

---

---

1. What is a map?

---

---

---

2. What is meant by the scale of a map?

---

---

---

---

---

3. Which is the largest, and which is the smallest of these three scales?

- a. 1:50 000
- b. 1:500 000
- c. 1:5 000 000

---

---

4. If you wanted to study World trade routes, would you use a large or a small scale map?

---

---

---

5. If you wanted to study the layout of roads in a single suburb, would you use a large or a small scale map?

---

---

---

6. Name three map series produced, and commonly used, in South Africa.

---

---

---

1. What is a topographic map?

---

---

---

2. What is the standard scale at which South African topographic maps are produced?

---

---

3. What is a grid reference on a map?

---

---

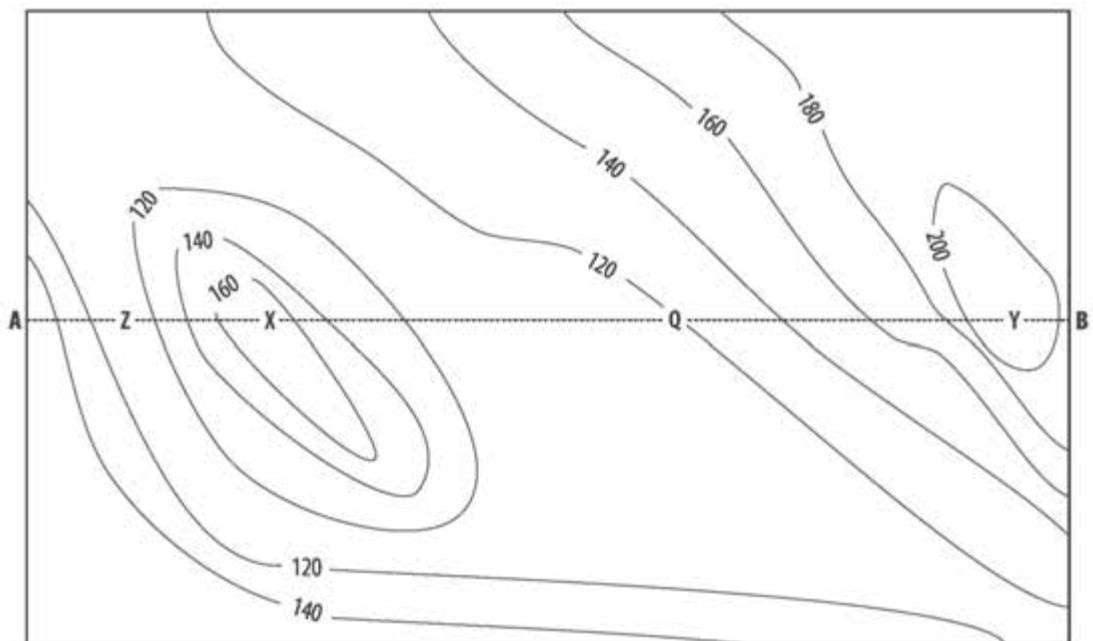
---

---

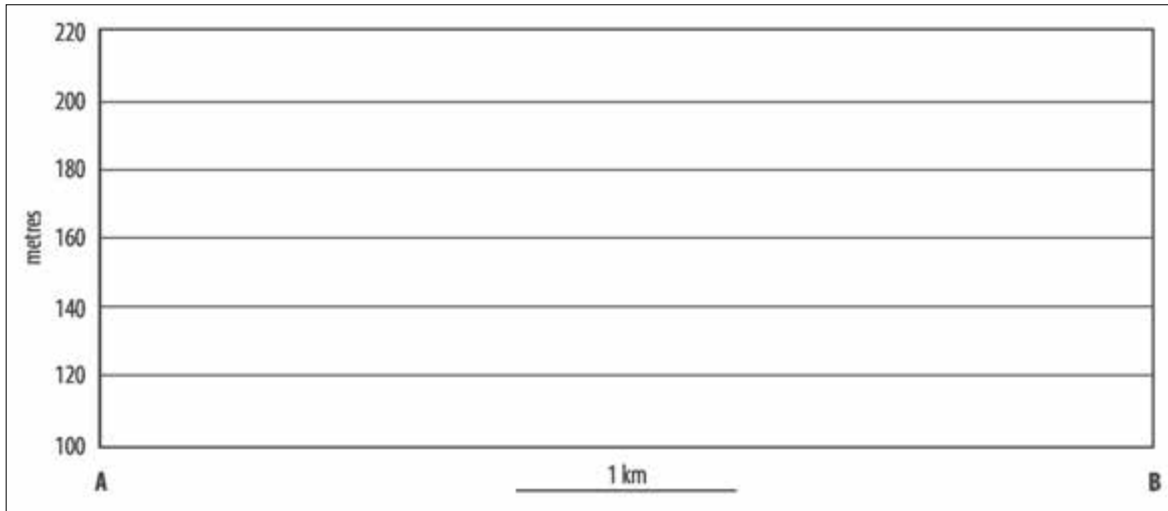
---

---

4. Look at the simple contour map and the frame on the next page.



© You may photocopy this page for use with *Study & Master Geography Grade 12*.



a. Using the frame, construct a cross-section from A to B.

A large empty rectangular box for drawing a cross-section.

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

b. Calculate the mean gradient from Q to Y.

---

---

---

---

---

---

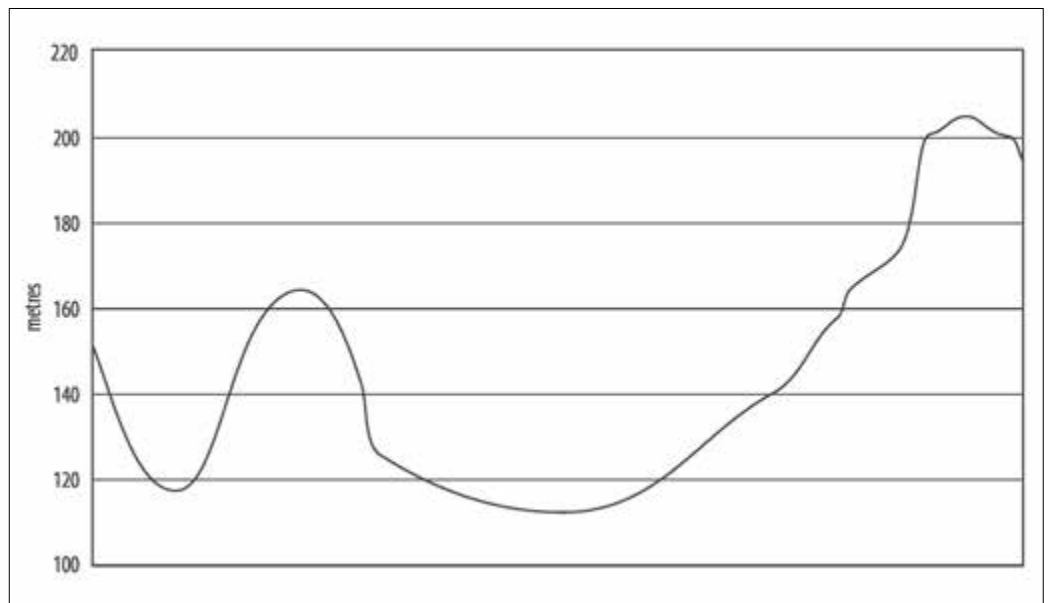
c. Is X visible from Y?

---

d. Is Z visible from Y?

---

5. Look at the following frame.



a. Is the horizontal scale the same as the frame above?

---

b. Are the vertical scales on the two frames the same?

---

c. If not, by what ratio is the one bigger/smaller than the other?

---

---

---

---

---

---

d. What do we call the practise where we increase the vertical scale on a cross-section, and why do we do this?

---

---

---

---

Look at the map extracts 3322CD and 3422AB George on pages 284 and 285 as well as the two photos labelled A and B below, then answer the questions.



George A



George B



1. In which direction was the camera pointing when photo A was taken on the runway at George airport? Explain your answer.

---

---

---

---

---

2. In which direction was the camera pointing when photo B was taken after take-off? Explain your answer.

---

---

---

---

---

3. Is photo B a high or low angle oblique aerial photo? Explain.

---

---

---

4. Look at the photo of George on page 287. What type of photo is this?

---

5. How would you describe George's street pattern?

---

---

---

1. What exactly are geographical information systems?

---

---

---

---

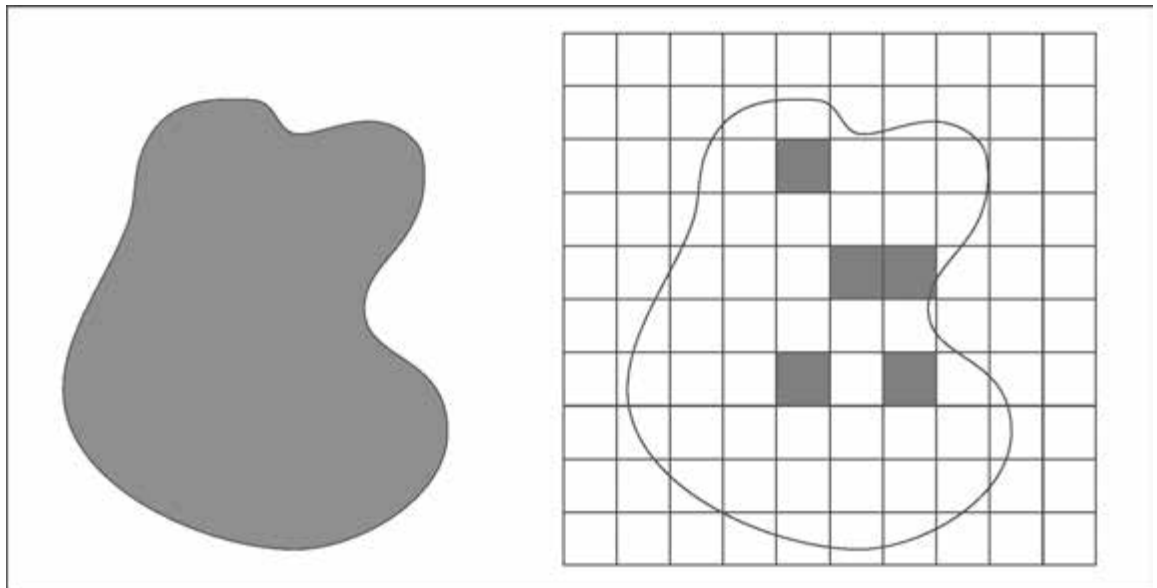
---

---

---

---

2. Which of these diagrams shows vector, and which shows raster data? Explain the difference.



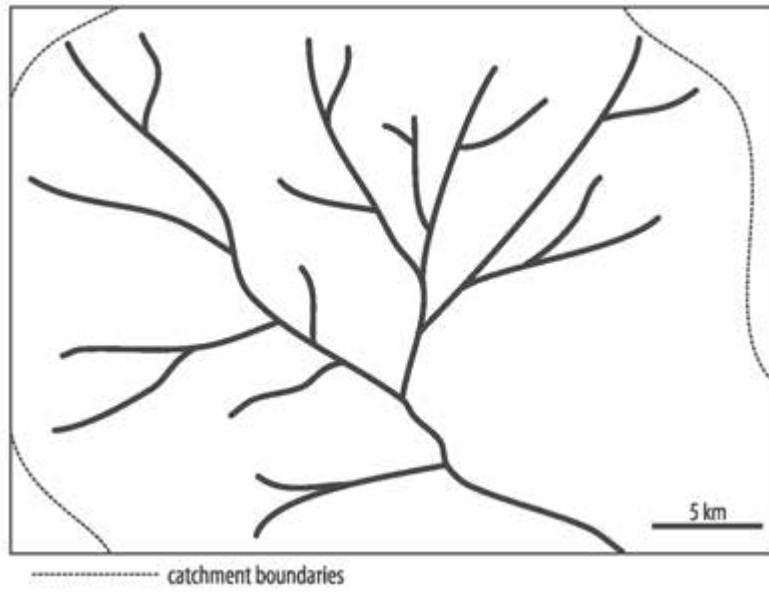
---

---

---

---

3. Look at the two diagrams below and answer the questions.



- a. In a GIS, what would these features be called?
- \_\_\_\_\_
- b. If we combine a number of these features in a GIS, what are we creating?
- \_\_\_\_\_
- c. If you were asked to define a suitable area for agriculture using the information in the diagrams, would it be sufficient? If yes, explain your reasoning. If no, what other information might you wish to include?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

1. Define the following concepts:
  - a. isolated farmstead

---

---

- b. hamlet

---

---

2. Look at the photographs below and identify what type of settlement **a**, **b** and **c** are.



(a)



(b)



(c)

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

---

---

---

3. For settlement **b**:

a. Give two characteristics of the settlement.

---

---

---

---

b. Name two physical features that could have determined the location of the settlement.

---

---

---

---

c. Name the main economic activity of the settlement.

---

1. Define the concept 'rural depopulation'.

---

---

2. In the following photograph:

- a. What factors can you identify that affect rural development?

---

---

---

---

- b. How would these factors impact on the socio-economic status of people?

---

---

---

---



© You may photocopy this page for use with *Study & Master Geography Grade 12*.

3. Look at the photographs below and then answer the questions:
- What basic needs are being met for these rural people?

---

---

---

---

---

- What basic needs are lacking?

---

---

---

---

---



© You may photocopy this page for use with *Study & Master Geography Grade 12*.

Read the extract below and answer the questions that follow.

### Mapungubwe: South Africa's first pre-colonial 'city'

The site of South Africa's lost city, Mapungubwe, is a World Heritage site. Mapungubwe is an area of open savannah at the confluence of the Limpopo and Sashe Rivers.

One thousand years ago, it was the centre of Southern Africa's largest kingdom. Its inhabitants, the ancestors of the Shona people of Zimbabwe, traded gold and ivory with China, India and Egypt. The settlement thrived as a trading centre between 1220 and 1300. One of the most spectacular archaeological finds is the little gold rhinoceros which is a wooden carving covered with thin gold sheet.

Climate change eventually forced Mapungubwe's people to abandon the site – they headed further north into present-day Zimbabwe.



The site of Mapungubwe

(Source: [www.southafrica.info/about/history/mapungubwe.htm](http://www.southafrica.info/about/history/mapungubwe.htm))



1. Compare the age of Mapungubwe to:
  - a. the world's oldest urban settlements

---

- b. Africa's oldest urban settlements

---

- c. South Africa's first colonial urban settlement

---

2. Describe Mapungubwe's site and situation.

---

---

---

---

---

---

---

---

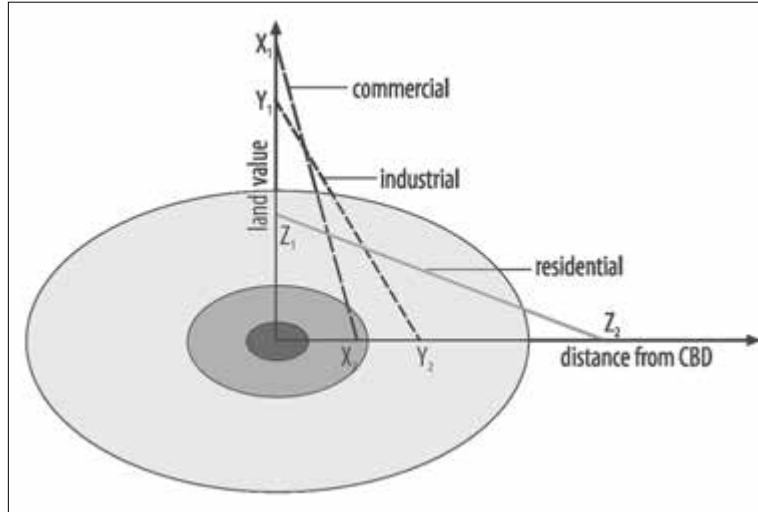
---

---

3. Name the famous urban settlement in Zimbabwe that followed Mapungubwe.

---

Refer to the bid-rent curve and complete the statements by selecting the correct option below.



1. As distance towards the city centre increases, land value (decreases/ increases).
2. (Factories/ Offices and shops/ Houses) make up the commercial sector.
3. (Factories/ Offices and shops/ Houses) make up the industrial sector.
4. (Factories/ Offices and shops/ Houses) make up the residential sector.
5.  $X_1$  is the (lowest/ highest) price commerce is willing to pay to rent or buy land.
6. The (commercial/ industrial/ residential) sector is the most flexible in its choice of land zone, because it spans the greatest distance.

1. Define the following concepts:

a. heavy industries

---

---

b. light industries

---

---

2. Differentiate between footloose and ubiquitous industries.

---

---

---

---

3. Name two key objectives for creating IDZs. Are these key objectives feasible for local people?

---

---

---

---

4. Name two problems associated with industrial centralisation.

---

---

---

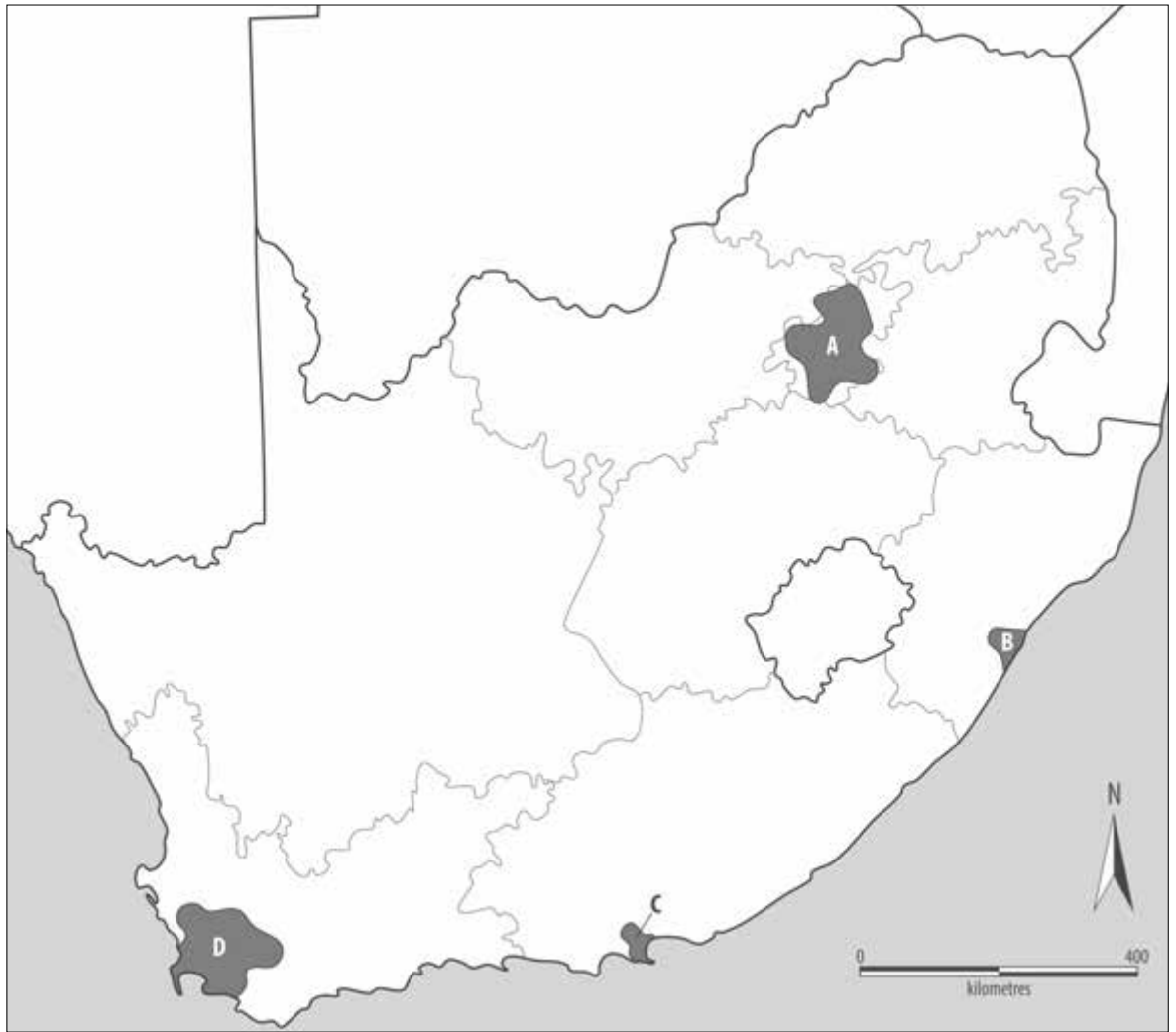
---

5. Provide one solution to the problems caused by industrial centralisation.

---

---

6. Look at the map below and answer the questions that follow.



a. Identify the industrial areas marked A, B, C and D.

---

---

---

---

b. Provide two factors that promote industry at A.

---

---

---

---

c. State the main type of industry found at B.

---

1. Define the concept 'formal sector'.

---

---

2. When employment rates rise, what happens to unemployment rates?

---

---

---

---

3. Name one economic sector in which the formal sector would be involved.

---

4. Define the concept 'informal sector'.

---

---

5. Name one way in which the government can improve conditions for street vendors.

---

---

6. What kinds of trading could unemployed people do to sustain themselves?

---

---

---

---

1. Explain what is meant by a thematic map.

---

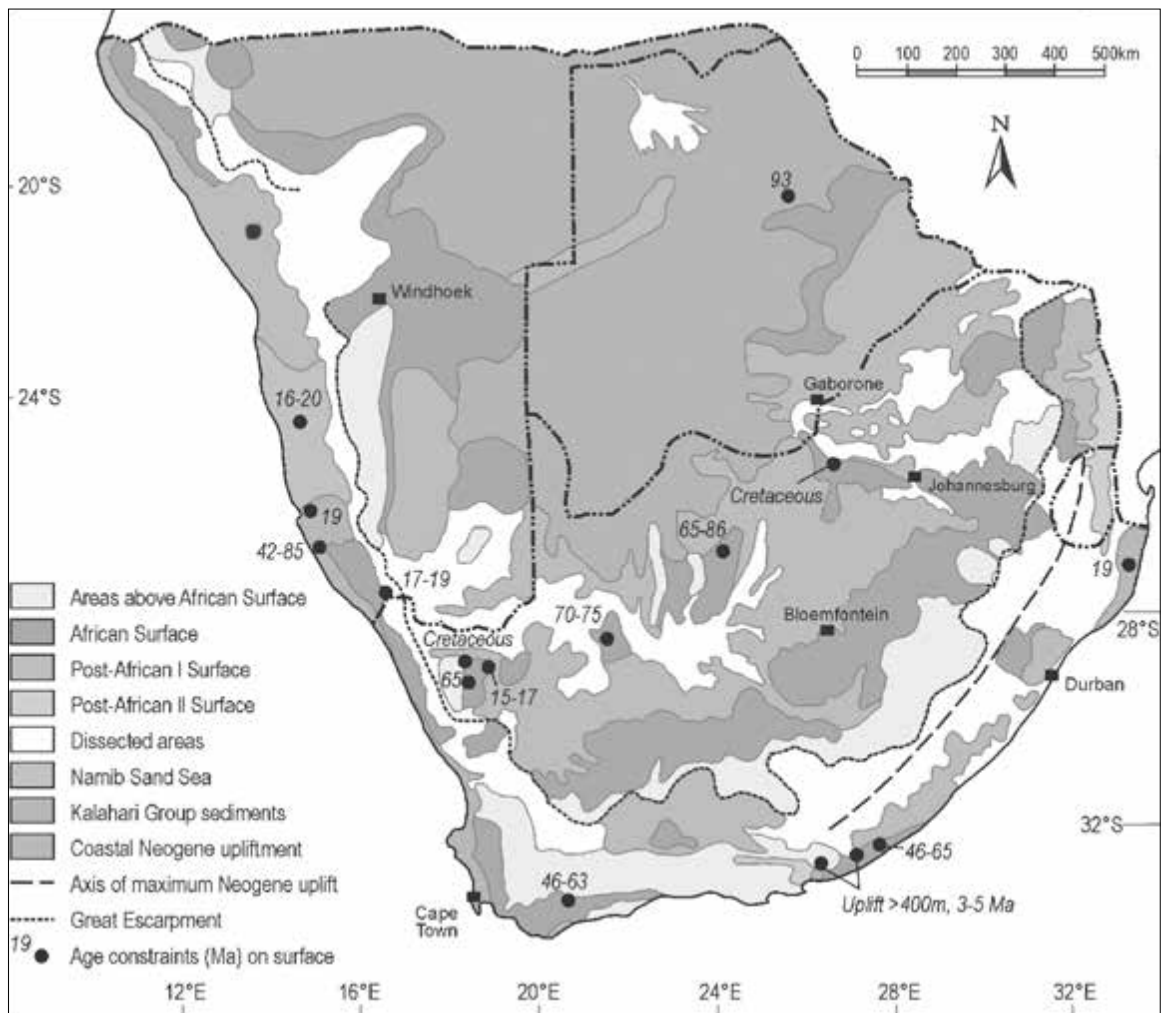
---

---

---

---

2. Is the following a thematic or a topographical map? Explain your answer.



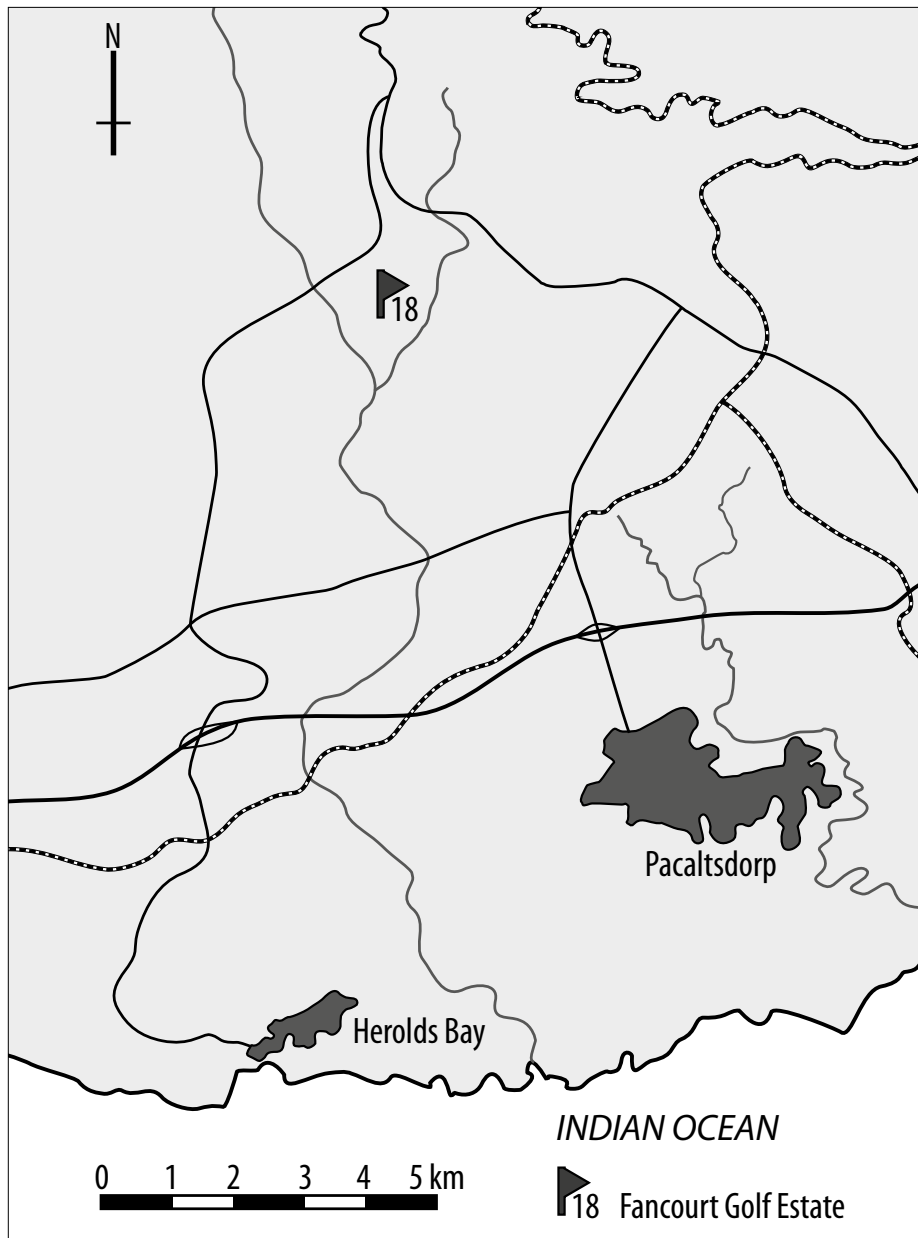
---

---

---

Use the map of George 3322CD & 3422AB on pages 284 and 285 and Sections A–D of the orthophoto map 3322CD 25 George on pages 286–289 to answer the questions.

1. On the sketch map below indicate the following:
  - a. the situation of the George airport
  - b. the shortest distance from the airport to Fancourt
  - c. the Gwaing River and indicate the direction of flow
  - d. the borders covered by the orthophoto map
  - e. colour the N2 blue
  - f. the location of George Industria
  - g. the location of the sewerage works southwest of George.



2. Identify the following features on the orthophoto map. Use the topographical map to help you.

a. A:

b. B:

c. C:

d. D:

e. E:

3. Describe three advantages of orthophoto maps.

---

---

---

---

---

---

---

---

---

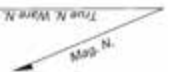
---



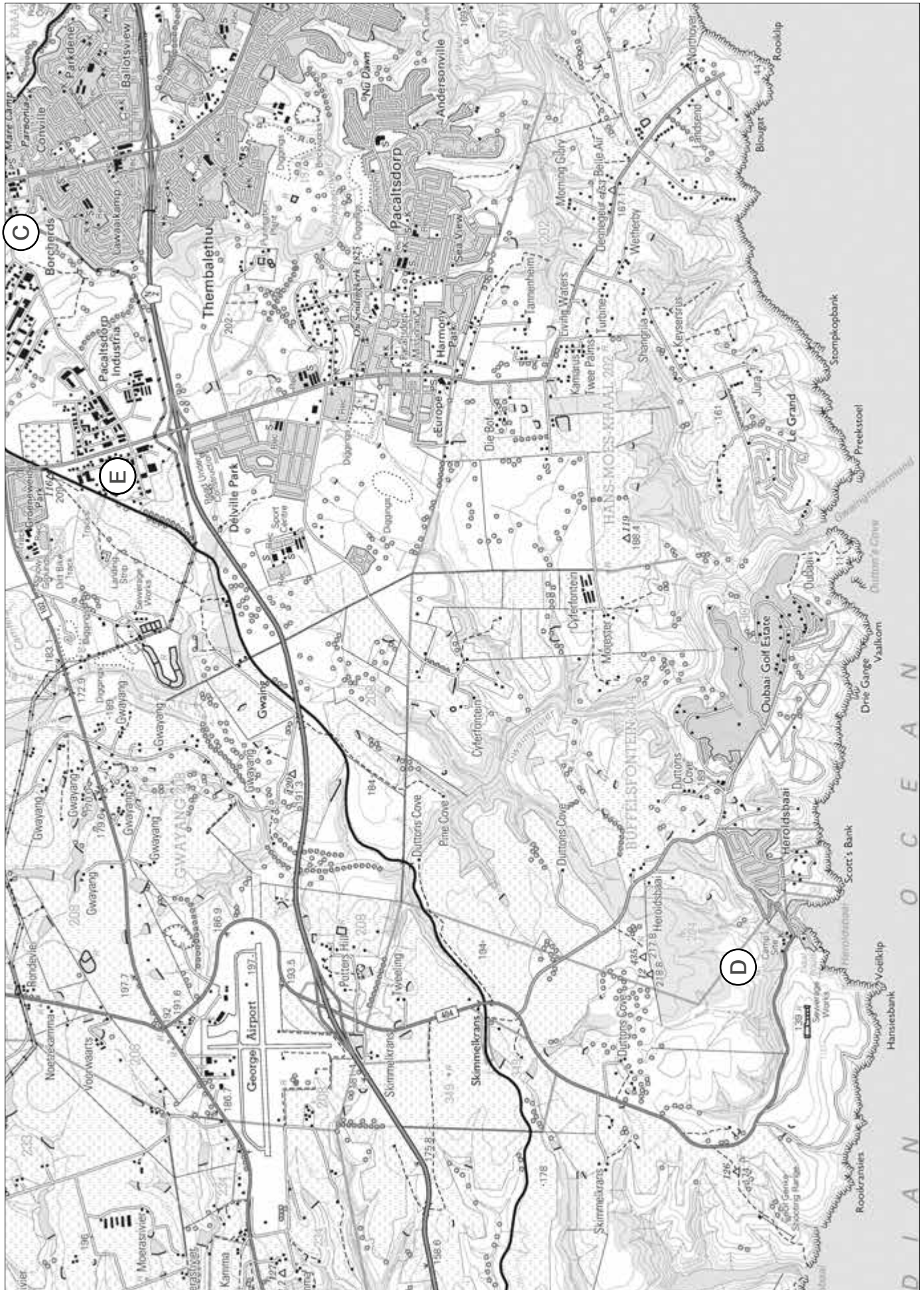


© You may photocopy this page for use with *Study & Master Geography Grade 12*.

Contour Interval 20 Metres



Contour Interval 20 Metres



© You may photocopy this page for use with *Study & Master Geography Grade 12*.

34°00'

22°29'30"

25

22°21'30"



Gauss Conform Projection. Central Meridian 23° East

Contour Interval 5 Metres  
Grid Interval 1 000 Metres

**A**

© You may photocopy this page for use with *Study & Master Geography Grade 12*.



Gauss Conform Projection. Central Meridian 23° East

Contour Interval 5 Metres  
Grid Interval 1 000 Metres

**B**

© You may photocopy this page for use with *Study & Master Geography Grade 12*.



C

© You may photocopy this page for use with *Study & Master Geography Grade 12*.



D

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

### 3. ANSWERS FOR PHOTOCOPIABLE WORKSHEETS

Worksheet 1 on  
page 260

#### Worksheet 1 (remedial)

##### ANSWERS

##### Stages of a mid-latitude cyclone

- 1 = initial; 2 = wave; 3 = mature; 4 = occlusions; 5 = dissipating
- a = 3; b = 5; c = 4; d = 1; e = 2
- a = warm front; b = cold front; c = occluded front

Worksheet 2 on  
page 261

#### Worksheet 2 (remedial)

##### ANSWERS

##### Drainage systems and fluvial processes

- 1 = source; 2 = tributary; 3 = confluence; 4 = river mouth; 5 = base level
- a. longitudinal  
b. transverse
- In the upper course, the transverse profile is narrow and shallow with steep valley sides. In the lower course, the transverse profile is wide and deep with gently-sloping or flat valley sides. This is because in the upper course the eroding power is high (friction is high and water flow is turbulent) and the discharge (amount of water) is low. But in the lower course, deposition dominates and the discharge is high.

Worksheet 3 on  
page 262

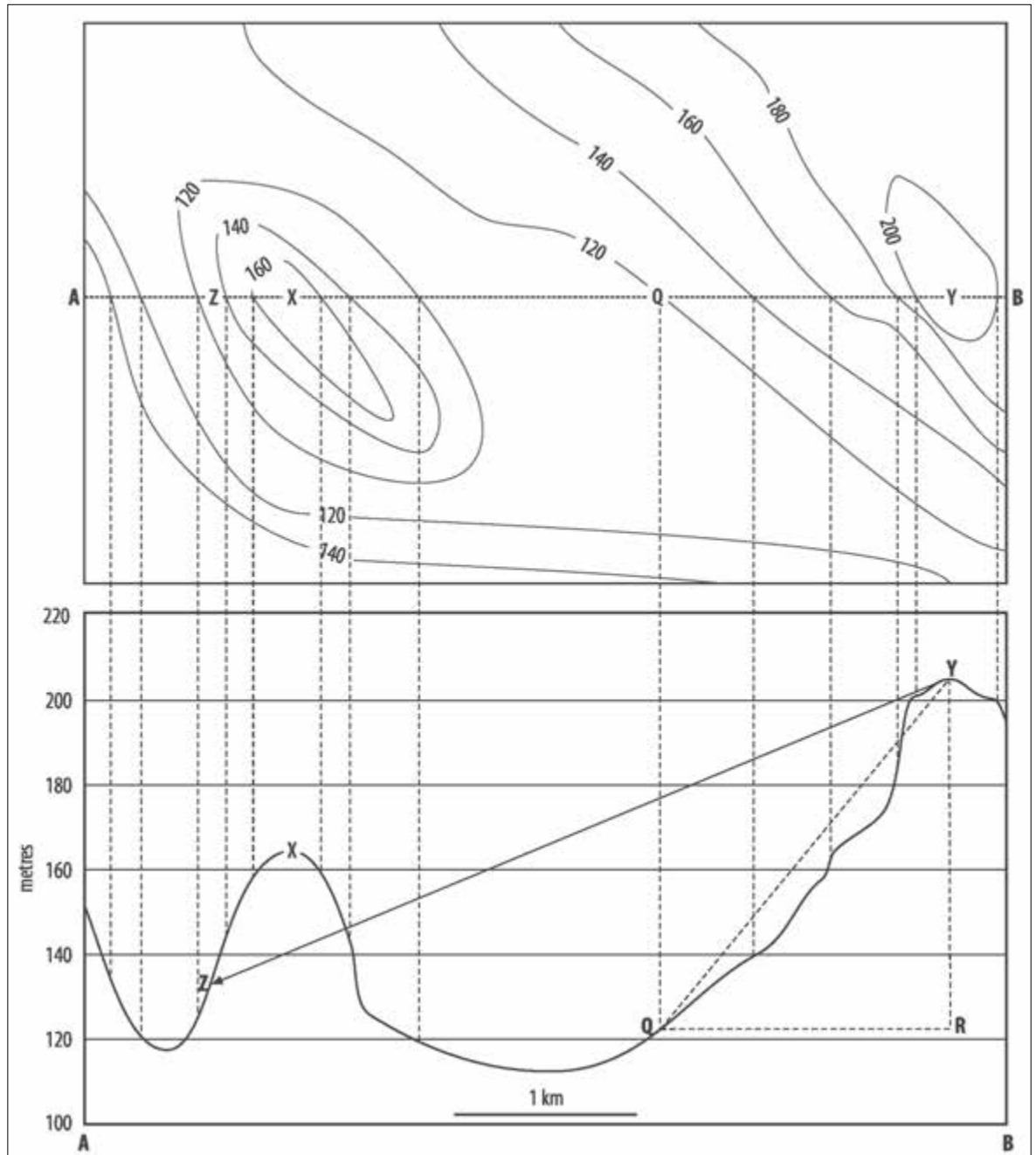
#### Worksheet 3 (remedial)

##### ANSWERS

##### Mapwork skills

- A map is a reduced representation of reality, typically drawn in two dimensions on paper, or shown on a computer screen.
- Scale is the ratio between the distance on the map, and the distance in reality. For example, a scale of 1:1000 means that 1 unit on the map represents 1000 of the same units (it could be cm, mm or even m) on the Earth's surface.
- 1: 50 000 is the largest, and 1: 5 000 000 is the smallest.
- A small scale map, because we need to "compress" a large part of the Earth's surface onto a single sheet of paper.
- A large scale map, because we need to show lots of detail.
- 1:50 000 topographical series  
1:250 000 cadastral  
1:50 000 and 1:250 000 geological series

1. A topographic map shows natural (relief, drainage etc.) and human features (transport routes, boundaries etc.).
2. 1:50 000
3. A system of parallel (North-South and East-West) lines dividing the map into numbered and labelled blocks (for example letters on one axis, and numbers on the other) for easy reference to a particular block.
- 4.



- a. See cross-section
- b. Look at the triangle Q-R-Y



- Gradient is the vertical interval (VI) here represented by Y – R over the horizontal equivalent (HE here represented by Q – R)
  - The VI is 80 m (read off from the cross section)
  - To get the HE, we need to multiply by the scale (provided). The HE is 1,67 km, or 1 670 m
  - It is now easy to cancel out, for a gradient of 1 in 20,85
  - We can round this off to 1:21
  - For every 21 metres that you move in a horizontal plane, you gain (or lose 1 metre in the vertical plane.
- c. Yes (see cross-section)
- d. No (see cross-section)
5. a. Yes
- b. No
- c. Simply measure the total vertical axis on the first cross-section, and compare it to the total length of the cross-section in the second example. You will see that the ratio is about 6:9 or 1:1,5. In other words, the second cross-section is one and a half times “taller” than the first.
- d. Vertical exaggeration (VE). We do this so that detail in the third dimension (height) stands out better on the cross-section.

Worksheet 5 on  
page 267

### Worksheet 5 (remedial)

#### ANSWERS

#### Photographs

1. North. Because, if you look at the map extracts, the mountains lie to the north of George and George airport, and run in an east-west direction
2. South. Because, if you compare the photo to the map, the sea is to the south, and the camera is aligned at right angles to the coastline.
3. High angle oblique, because the horizon is visible.
4. Vertical aerial photograph.
5. Grid-iron, or right angle street pattern.

Worksheet 6 on  
page 269

### Worksheet 6 (remedial)

#### ANSWERS

#### Geographical Information Systems (GIS)

1. Computer based software systems which allow spatial data to be stored and manipulated. The data (layers) can be superimposed upon one another and further manipulated or compared in order to solve certain spatial problems, perform spatial analysis, and answer various questions which involve data in a spatial context.
2. Vector data in the first diagram (lines, vectors and points are accurate) and raster data in the second (data refers to blocks or cells).
3. a. thematic layers
- b. a geodatabase (GIS database)
- c. There is not really sufficient information. Drainage and slope (the information we have) provide a basis for solving our problem (defining an area suitable for agriculture) but information on soils, rainfall, and existing roads and other infrastructure would be very useful.

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

## Worksheet 7 (remedial)

### ANSWERS

### Rural settlements

1.
  - a. An isolated farmstead or dwelling is not situated close to any other settlement. The farmer makes use of his or her own ideas and skills to manage the farmstead.
  - b. A hamlet is a small settlement with no economic services, shops, churches or recreational services.
2.
  - a. isolated farmstead
  - b. village
  - c. hamlet
3.
  - a. Any two of the following:
    - a small group of dwellings situated in close proximity to each other
    - size of the settlement ranks between a hamlet and a town
    - minimal economic services offered, such as a school, general shops and agencies for banks
    - no major administrative services offered
  - b. river (water for farming); flat or gradual land
  - c. agriculture (farming)

## Worksheet 8 (remedial)

### ANSWERS

### Rural settlement issues

1. Rural depopulation is the migration of rural people to urban areas.
2.
  - a. Lack of basic needs for health and development, such as
    - lack of supply of running water (woman carrying water)
    - lack of electricity (no power lines installed)
    - lack of refuse collection (no bins)
    - lack of good infrastructure (dirt road)
  - b. The lack of running water and refuse collection causes the spread of diseases such as cholera. Dirt roads will be flooded and washed away when it rains, so houses are inaccessible other than on foot. Lack of electricity means people use fires, candles and gas, all of which can be dangerous.
3.
  - a. In photograph A there are VIPs, so they are getting basic sanitation.
  - b. No clean running water for irrigation or washing clothes; no electricity; no refuse collection

## Worksheet 9 (extension)

### ANSWERS

### Urban settlements

1.
  - a. 6 000 years newer/younger
  - b. 3 000 years newer/younger
  - c. at least 400 years newer/younger (Cape Town was first established in 1652)

2. *Site*: Between two rivers – Limpopo and Sashe – for water availability; Mineral availability – gold; Savannah vegetation supports wildlife, such as elephants, which in turn provided tusks for ivory.  
*Situation*: Sufficiently close to eastern coast for getting goods to sea ports.
3. Great Zimbabwe

Worksheet 10 on  
page 277

## Worksheet 10 (remedial)

### ANSWERS

### Urban land value

1. increases
2. offices and shops
3. factories
4. houses
5. highest
6. residential

Worksheet 11 on  
page 278

## Worksheet 11 (remedial)

### ANSWERS

### Structure of the economy

1.
  - a. Heavy industries are more capital intensive and less consumer orientated and have more environmental impact.
  - b. Light industries are less capital intensive and more consumer orientated, with less environmental impact.
2. Characteristics of footloose industries are any of the following:
  - light industries
  - location is not influenced by markets or raw materials
  - emphasis is on direct line of business
  - operate through fax and telephone lines
 Characteristics of ubiquitous industries are any of the following:
  - usually light industries
  - emphasis on local materials
  - material available to manufacturer
  - associated with low-order functions
3. Any two of the following:
  - provide government assistance and support to the poor and
  - historically disadvantaged where economic potential exists
  - promote trade and industry with the aim of creating jobs
  - promote international competition
  - promote investment in these areas
  - increase private sector investment
  - promote participation between different sectors
 No, not without assistance from government and the private sector.  
Local people in IDZs are usually too poor and disadvantaged to create and promote industry.
4. Any two of the following:
  - overcrowding
  - surrounding areas are left poor
  - surrounding area's infrastructure is limited
  - surrounding area's basic needs are lacking

- less emphasis is put on the surrounding areas
  - surrounding towns or areas are 'dormant towns' as people only sleep there.
5. industrial decentralisation
  6. a. A: PWV/Gauteng; B: Durban/Pinetown;  
C: Port Elizabeth-Uitenhage; D: South Western Cape Metropole
  - b. Any two of the following:
    - Rich in raw materials and minerals
    - Good supply of power
    - Good water supply
    - Skilled and unskilled labour
    - Access to local and international markets
    - Good transport infrastructure
  - c. Any of the following:
    - food processing
    - textiles and clothing
    - fish canning and packaging
    - power station
    - petroleum refinement

Worksheet 12 on  
page 280

## Worksheet 12 (remedial)

### ANSWERS

### Informal and formal sector

1. The formal sector consists of companies that have fixed business premises and pay tax to the receiver of revenue.
2. They decrease.
3. Any one of the following:
  - primary
  - secondary
  - tertiary
4. The informal sector is characterised by small, medium and micro enterprises that have no fixed business premises and do not pay tax.
5. By incorporating the informal sector into the formal sector
6. Any of the following:
  - spaza shop
  - vendors and street traders
  - shoe repairs business
  - shoe-cleaning business
  - hairdressers working from home

Worksheet 13 on  
page 281

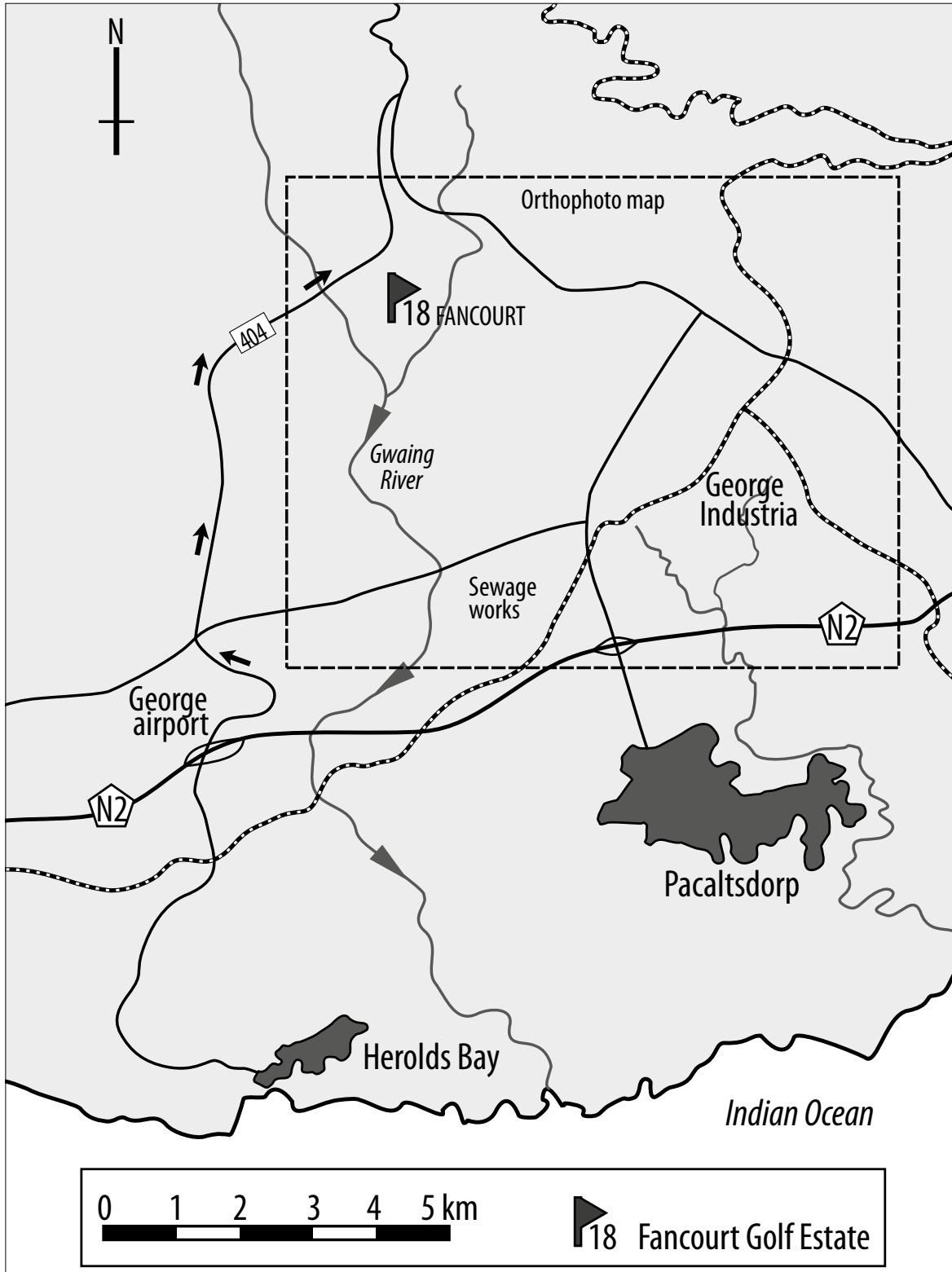
## Worksheet 13 (revision)

### ANSWERS

### Using atlases

1. A thematic map shows information related to a particular topic or theme. It is drawn specifically for this purpose. Maps of population density and distribution, vegetation maps, and political maps are all thematic.
2. Thematic. It shows a specific theme, namely erosion surface (land surfaces) over southern Africa.

1.



2.
  - a. A: Heather Park
  - b. B: sportsground
  - c. C: a dam
  - d. D: Camphersdrift River
  - e. E: industrial area
  
3. Orthophoto maps are much cheaper to produce than conventional maps. The larger scale allows for more detailed study. They are easier to update than conventional maps.

## 4. LESSON PLAN TEMPLATE

Topic of lesson	
Time	
Curriculum and Assessment Policy Statement (CAPS) content	
Resources	
THE LESSON	
Introduction	
Main part of lesson	
Conclusion	
Informal assessment	

© You may photocopy this page for use with *Study & Master Geography Grade 12*.

## 5. DOCUMENTS

This section can be used to file the Curriculum and Assessment Policy Statement (CAPS) for Geography (Grades 10–12) and any other documents supplied by the Department of Basic Education.









# Study & Master

## Geography

*Study & Master Geography Grade 12* has been especially developed by an experienced author team for the Curriculum and Assessment Policy Statement (CAPS). This new and easy-to-use course helps learners to master essential content and skills in Geography.

The comprehensive Learner's Book:

- includes hundreds of good-quality maps, photographs and diagrams in full-colour
- offers current and relevant content
- explains key concepts and geographical terms in accessible language
- includes over 150 activities that develop learners' skills and understanding
- provides for frequent consolidation in its Review and Exam Preparation sections.

The innovative Teacher's Guide includes:

- guidance on teaching each lesson of the year and on assessment
- answers to all activities in the Learner's Book
- photocopiable tests and examinations
- extra assessment tasks
- photocopiable consolidation, extension and revision activities.

**Norma Winearls** has taught Geography for 34 years in both the United Kingdom and South Africa. She is currently Principal of the Middle School at St George's Grammar School in Cape Town. **Peter Holmes** has been Professor and Head of the Geography Department at the University of the Free State since 2003. His teaching career started in the Eastern Cape where he had taught high school Geography before joining UCT as lecturer/senior lecturer in Environmental and Geographical Science.



PROUD PARTNERS



**CAMBRIDGE**  
UNIVERSITY PRESS

[www.cup.co.za](http://www.cup.co.za)

ISBN 978-1-107-68837-7



9 781107 688377