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Chapter 1

Term 1

1.1 Land use patterns in various areas

1.1.1 Social Sciences

1.1.2 Grade 8

1.1.3 GEOGRAPHY: SETTLEMENTS

1.1.4 Module 2

1.1.5 Comparing land use patterns in various areas

1.1.5.1 Activity 1:

1.1.5.2 To interpret information from Sources and answer ensuing questions

1.1.5.3 [LO 2.2]

Study the following illustrations and answer the questions that follow:

\[^1\text{This content is available online at \langle\text{http://cnx.org/content/m31561/1.1/}\rangle.}\]
1. What type of land use would you say is most prominent in this area?
2. Would you say that there has been a change in the original use of land in this area? Give a reason for your answer.
3. How did the activities impact on the natural resources of the environment?
4. Would you say that this is the ideal situation for urban development and land use?

1.1.5.4 Activity 2:

1.1.5.5 To interpret information from sources and answering ensuing questions

1.1.5.6 [LO 2.2]

Study the following illustration and answer the questions that follow:

Figure 1.2

1. Is the area depicted in the illustration, densely or sparsely populated? Motivate your answer.
2. Would you classify the area as rural or urban?
3. What type of land use is depicted in the illustration?
4. Would you consider the price of land in this area as cheap or expensive? Motivate your answer.

1.1.5.7 Activity 3:

1.1.5.8 To obtain information from environmental sources

1.1.5.9 [LO 2.2]

Answer the following questions:

1. Find out what percentage of the town/city where you live, or closest to where you live, is set aside for industrial purposes.
2. Find out what percentage (%) of the town/city is set aside for residential purposes.
3. Where would you expect to find the areas where the more wealthy people live? Is it close to the central business district or on the outskirts?
4. Migration of the population due to political policies

In South Africa we find a unique land use pattern, because of the political decisions of the past. If we look at an urban map of Port Elizabeth, we notice that certain neighbourhoods are inhabited by more than one population group. This is still the result of the policy of segregation and apartheid legislation before 1994. This policy determined that different population groups were to live in separate areas.
Figure 1.3
There was a time when Port Elizabeth's South-End was inhabited by various population groups. However, when the National Party was in power, all residents were relocated to areas such as Malabar and New Brighton. Members of the Indian community were forced to settle in Malabar, and coloured people in New Brighton. This meant that certain people had to leave their homes and start anew. They had no choice as to where they preferred to live. Those belonging to a specific population group were obliged to move to an area allocated to people of their own culture.

Today we still suffer from the effects of this policy. Sometimes people were concentrated in a neighbourhood without a proper infrastructure like roads, electricity and housing. They could not afford to live anywhere else.

1.1.5.10 Activity 4:

1.1.5.11 To obtain and interpret information from maps

1.1.5.12 [LO 1.2]

Study the following illustration and answer the questions that follow
1. What do you know about the sizes of homes in different neighbourhoods?
2. What neighbourhood would be most densely populated?

After 1994 steps were taken to compensate some of the people who had been forced to abandon their homes. This changed the shape of current urban patterns. A special commission was formed to handle land claims. The purpose is to rectify the possession of land of those who had been previously disadvantaged by political decisions. Where the original site is no longer available, the family is entitled to financial compensation. Everybody is now entitled to choose where they wish to live. No politician can decide who is to buy or own property, and where.

1.1.5.13 Activity 5:
1.1.5.14 To conduct a personal interview and draw inferences from the discussion
1.1.5.15 [LO 2.3]

On your own: Conduct an interview with a person in your environment who had to uproot as a result of the forced political removals in the 1970's. Find out more about the effect it had on them and on the lives of their families. Then write a transcription of the discussion. (Tip: Take a tape recorder along and tape the interview to be transcribed later. Remember to ask permission for the discussion to be taped.)
1.1.6 Assessment

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
<table>
<thead>
<tr>
<th>Learning Outcomes (LOs)</th>
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<tbody>
<tr>
<td>LO 1</td>
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<tr>
<td>Geographical Enquiry</td>
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<tr>
<td>The learner will be</td>
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<td>able to use enquiry</td>
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<td>skills to investigate</td>
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<td>geographical and</td>
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<td>environmental concepts</td>
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<td>and processes.</td>
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<th>Assessment Standards (ASs)</th>
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<td>This is seen when the</td>
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<td>learner:</td>
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<td>1.2 interprets</td>
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<td>information from</td>
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<td>maps and atlases and</td>
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<td>[working with sources];</td>
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<td>1.7 in various</td>
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<td>ways reports</td>
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<td>knowledge obtained</td>
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<td>formulating an argument</td>
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<td>based on information</td>
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<td>found; uses maps,</td>
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<td>diagrams and graphics;</td>
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<td>uses, where possible,</td>
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<td>computers in the</td>
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<td>presentation [putting</td>
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<tr>
<td>the answer across].</td>
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</table>

| LO 2                   |
| GEOGRAPHICAL KNOWLEDGE |
| AND UNDERSTANDING      |
| The learner will be    |
| able to demonstrate   |
| geographical and       |
| environmental knowledge|
| and understanding.     |

| This is clear when the |
| learner:               |
| 2.1 identifies        |
| and compares various  |
| kinds of settlement   |
| patterns [people and  |
| places];              |
| 2.2 identifies factors |
| that influence the    |
| formation of          |
| settlement patterns   |
| (natural, economic,   |
| social/political)    |
| [people and resources]; |
| 2.3 identifies crucial |
| factors leading to    |
| changes in settlement |
| patterns in South     |
| Africa, Africa and    |
| elsewhere [people and |
| environment].         |

Table 1.1

1.1.7 Memorandum

**ACTIVITY 1**

1. This is an area where mostly large (heavy) industries are located. Adjacent to that is a lower-income housing area (squatter camps or informal housing settlements).
2. YES!

The area was originally planned and used for industrial purposes. However, the need for labour caused people to erect informal settlements adjacent to the industrial area. The expenses of transport are eliminated, as people live close to their work.

1. Deforestation takes place to clear areas for squatters' shacks. Even more trees are chopped down to be used for firewood and building materials. There is a problem with pollution. Soil and water resources are polluted.
2. DEFINITELY NOT!

It is unplanned and uncontrolled.

Living conditions in these areas are unhygienic. People live in squalor, as basic services are minimal or non-existent. This is a breeding-ground for diseases and other problems, and presents a big fire hazard.

**ACTIVITY 2**

Available for free at Connexions (<http://cnx.org/content/col11036/1.1>)
1. Sparsely populated. It depicts the Central Business District (CBD). Commercial activities are dominant and areas are not densely populated. A large number of people daily commute to the CBD, by means of private or public transport.

1. Urban.
2. Central Business District.
3. EXPENSIVE.

Most accessible area in the urban settlement. Due to functional magnetism, all big business and service concerns compete for business premises in the CBD. As a consequence land is very expensive and multi-level sky-scrapers are commonly found.

ACTIVITY 3

1. Own answer: Varies from area to area.
2. Own answer: Varies from area to area.
3. Always on the outskirts in the best possible area zoned for housing. These areas usually have good or attractive views, or are situated adjacent to a green belt, or in a golf course development or estate.

ACTIVITY 4

1. There is a definite difference in the size of the houses among the different neighbourhoods. It varies from informal housing on common land to luxury housing on private, separate stands.
2. The informal (squatter) area.

1.2 Functions of land use

1.2.1 Social Sciences
1.2.2 Grade 8
1.2.3 GEOGRAPHY: SETTLEMENTS
1.2.4 Module 3
1.2.5 PURPOSES FOR LAND USE

The lay-out of a town or city plan shows that different areas are allocated for different purposes. The lay-out of any town or city must be well-planned. It would for instance be disastrous to allow an industry releasing toxic substances in a residential area. For this reason townplanners work years ahead to regulate each area regarding its functions, transport and land usage. It may however happen that the function of certain buildings change.

In Port Elizabeth for instance, many houses are now used for business purposes. The central business district has since been relocated. Close to Greenacres we are already beginning to see the head offices of banks and insurance companies. What once used to be part of the Mill Park residential area, is gradually becoming business premises.

1. Functions of land usage in South African cities

When we consider land use in an urban area, we find that certain basic functions are usually found in all cities. The total urban area usually consists of a number of developed areas, while others are still undeveloped.

The developed area usually consists of two types of areas, on for private and the other for public development.

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*This content is available online at [http://cnx.org/content/m31565/1.1/].

Available for free at Connexions [http://cnx.org/content/col11036/1.1]*
Areas for private development
The area for private development usually includes three types of land use functions:
a) Residential – e.g. private homes, terraced houses, flats and townhouse complexes.
b) Industries – e.g. storage, light industries and heavy industries.
c) Commerce – e.g. retail, wholesale, financial and professional enterprises.
Areas for public development
The areas for public development serve four types of land functions:
a) streets
b) recreation – such as parks, sports grounds and culture
c) public services – such as hospitals, airports, cemeteries and sewerage
d) education – primary and high school
Undeveloped areas
The undeveloped areas can usually be classified under two headings:
a) unused, open areas
b) agricultural land

1.2.5.1 Activity 1:

1.2.5.2 To describe the role and function of land use

1.2.5.3 [LO 2.2]

Study this illustration of an urban area and answer the questions:
1. Where is the business district of the urban area situated?
2. Would you describe \textbf{b} as a high-income or a lower-income residential area? Give a reason for your answer.
3. What natural obstruction could prevent possible future expansion of the city in a northerly direction (see \textbf{c})?
4. Are there adequate sporting facilities to provide in the needs of the city-dwellers?

1.2.5.4 \textbf{Activity 2:}

1.2.5.5 To discuss the function of land in any given environment

1.2.5.6 [LO 2.2]

nb: Teachers should note that this activity is a practical assignment that can be executed in groups of two.
2 The function of the land in my environment
Study the table and additional information and follow the teacher’s instructions to determine the use of land in your own environment.

<table>
<thead>
<tr>
<th>Land use category</th>
<th>description</th>
<th>Plot No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factories/Industries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wholesalers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commerce</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Services</td>
<td>e.g. churches, hospitals, airports, etc.</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>e.g. schools, universities, etc.</td>
<td></td>
</tr>
<tr>
<td>Open unused areas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agricultural land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Streets</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1.2

The teacher will assign one street block to every two learners. Learners must then fill in the details regarding the use of land on a table similar to the one on the previous page. Learners are also expected to draw a rough map of their area. If possible, it should also show the respective numbers of the plots.

IMPORTANT: Don’t walk about on your own in an unsafe area. Stay in a group. Teachers must ensure that learners don’t find themselves in areas which might be unsafe.

Assignments for groupwork:
Hand in your work sheets containing the data, as well as a neat map depicting that part of the rural area where your survey was made.

3. Urban services

The bigger the town or city, the more services are usually found. As more people live in cities, more services are needed. For any business to be profitable, there has to be a minimum number of persons to support such a business. A pharmacy depends on at least 2 000 customers to survive. Certain services, however, are available in all cities, for example post offices, while other services are only available in some cities, for instance universities.

Urban services fall in different categories, such as:
  a) Public services such as libraries, magistrate’s offices, hospitals, police stations, schools and churches.
  b) Financial and professional services, such as medical practitioners, dentists, veterinary surgeons, attorneys, banks and insurance companies.

Commercial enterprises such as pharmacies, jewellers, furnishers, outfitters and bakeries, as well as butchers and car dealers.

4. Urban problems

Cities experience a variety of problems due to factors such as a rapid increase of residents, that put a strain on resources. The following problems are generally found in most cities:
  a) Traffic problems due to the large number of residents who are road users.
  b) Pollution due to gases emitted by factories and cars.

  a) Strain on agricultural land bordering on the outskirts of the city due to the demand for land development.
  d) Deterioration of buildings in the CBD due to age and a lack of maintenance.

5. The impact of human activities on the environment

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
1.2.5.7 Activity 3:

1.2.5.8 to identify problems and find the right solutions
1.2.5.9 [LO 2.3]

Study the following illustration and answer the questions that follow:

![Figure 1.7]

1. What serious problem do residents of this city face?
2. Which steps could be taken to improve or prevent the situation?
3. In what way could recycling contribute to relieve the strain of human waste on the environment?
4. What will happen if the human race continues to pollute the earth’s environment, air and water resources?

**Further assignments for group work:**
Find more information on the following forms of pollution:

1. Air pollution
2. Water pollution
3. Soil pollution

1.2.6 Assessment
CHAPTER 1. TERM 1

LO 1
Geographical Enquiry
The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

Assessment Standards (ASs)
This is seen when the learner:

1.2 interprets information from maps and atlases and from graphic and statistical

1.5 identifies and records information in the specific field [working with sources];

1.7 in various ways reports knowledge obtained during the study by formulating an argument based on information found; uses maps, diagrams and graphics; uses, where possible, computers in the presentation [putting the answer across].

LO 2
GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING
The learner will be able to demonstrate geographical and environmental knowledge and understanding.

This is clear when the learner:

2.1 identifies and compares various kinds of settlement patterns [people and places];

2.2 identifies factors that influence the formation of settlement patterns (natural, economic, social/political) [people and resources];

2.3 identifies crucial factors leading to changes in settlement patterns in South Africa, Africa and elsewhere [people and environment].

| Table 1.3 |

1.2.7 Memorandum

ACTIVITY 1
1. More or less in the middle. Always in the most accessible part of the urban area.
2. Low-income housing area. This is an informal settlement area, in other words a squatter area. B is also adjacent to an industrial area, which makes it highly unsuitable for high-income housing.
3. Industries.
4. No provision was made for sport facilities.

ACTIVITY 2
Answer according to the area where you live.

ACTIVITY 3
1. Pollution. The lack of refuse removal as a basic survive is the underlying problem.
2. Providing more and free rubbish bins and big refuse containers. Launching educational programs in the community.

Factories in the distance (on the diagram) can be forced by means of legislation to install filters in chimneys for combating pollution.

1. Very important role. Recycling containers can be placed on strategic points. Separate containers (clearly marked) for paper; glass and tins.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
2. The destruction of the environment will increase to such an extent that future generations will not be able to enjoy the same quality of life as present generations. May lead to an outbreak of diseases and epidemics.

1.3 Migration³

1.3.1 Social Sciences

1.3.2 Grade 8

1.3.3 GEOGRAPHY: SETTLEMENTS

1.3.4 Module 4

1.3.5 MIGRATION

1. The migration of people to new surroundings

You have already become acquainted with the migration of people from the countryside to the city. Migration, however, does not only take place from rural to urban areas. People move from one urban area to another, and also from one country to another.

Migration from the place where you have been living for many years, e.g. from Cape Town to a new city, e.g. London, is known as EMIGRATION.

Migration to a place where you have found a new home, is called IMMIGRATION, e.g. to London.

Migration is a permanent relocation to a new environment or place.

Reasons for migration

There are various reasons why people move from one place the other. These factors can usually be divided into two categories, namely:

- Push factors – factors that encourage people to leave a specific area.
- Pull factors – factors that entice people to settle in a specific area.

1.3.5.1 Activity 1:

1.3.5.2 To obtain information about migration

1.3.5.3 [LO 1.2]

Collect information about people who migrate to other countries and answer the questions that follow:

1. What circumstances in South Africa do you think made people decide to take such a step?
2. What influence will this tendency have on the South African economy if highly schooled workers are to leave the country in large numbers?

2. Factors that promote migration

2.1 Push factors

Push factors play an important role as a reason for migration. Push factors can mainly be divided into three categories:

a) Political factors: political factors play a role where people immigrate due to pressure or persecution experienced in their land of birth. During the years of Apartheid many black South Africans left the country and went to live elsewhere, e.g. in England and Europe due to political pressure and persecution that they suffered here, as well as the lack of educational opportunities.

b) Economic factors: economic factors play a role when the economic system of a country is not favourable, causing people to leave for another country where they can enjoy a better life. Many people have moved to the USA and England where better working conditions are available.

³This content is available online at <http://cnx.org/content/m21522/1.1/>.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
c) **Environmental factors:** people also leave their homes because of an unfavourable physical environment. Too much or too little water may be a serious hazard for the environment. People are forced to move because they live on the flood plains of a river. During a flood their properties and lives are threatened by the water masses.

### 1.3.5.4 Activity 2:

#### 1.3.5.5 To communicate personal experiences in writing

**1.3.5.6 [LO 1.5]**

**On your own**

You are a migrant worker who helps to harvest fruit in the Cape. You work on a farm near Worcester. Write a letter to your family living in Kimberley, describing the difficult living and working conditions you experience.

**Political push factors**

People are often obliged to leave their country due to persecution or threats to their lives because of their political ideas. These refugees must then find themselves another place to live. They cannot return to their country, because their lives are in danger.

Many people had to flee from former East European countries because they did not agree with the ideas of the political party in power.

In Zimbabwe we also find that many people flee to neighbouring countries, e.g. South Africa. When their political ideas differ from those of the ruling party, they are sometimes abused and tortured by members of the ruling party. This causes them to leave the country.

**Economic push factors**

When the economy of a country collapses, people are forced to flee to other countries to find food. One such example is the famine in Ireland in 1840 when the potato crops failed. About five million people died due to the food scarcity.

**Environmental push factors**

Water plays an important role here – either too little (drought) – or too much (floods). In the USA and Canada this is a common problem. People can be forced to leave their homes to survive.

### 1.3.5.7 Activity 3:

#### 1.3.5.8 To find examples of push factors by means of research

**1.3.5.9 [LO 1.7]**

**In groups**

Visit the library and find two examples of each of the following push factors:

- a) Political factors
- b) Economic factors
- c) Environmental factors

#### 2.2 Pull factors

**Political pull factors**

Sometimes countries with a democratic government is a popular destination for immigrants. Some persons living in a country where the political system allows very little freedom, may prefer to leave that country. One such example is the flow of immigrants from Eastern to Western Europe. However, this decreased considerably after the demolition of the Berlin Wall.

**Economical pull factors**

People often move to areas offering better work opportunities. One such drawcard is the exploitation of natural resources, such as oil and gold. Can you think of more places or towns that owe their existence to minerals? Despite extreme climatic conditions, people still venture to these areas to earn large sums of money. One example is workers on oil drills in the North Sea.
Environmental factors
People prefer to live in an area with a temperate climate. They avoid areas that become either very hot or very cold. Others may prefer a very dry climate, for the sake of their health, for instance those who suffer from asthma.

1.3.5.10 Activity 4:
1.3.5.11 To find information on emigration by means of research
1.3.5.12 [2.3]

In pairs
Find information on the number of people who emigrated from South Africa between 1993 and 1997. Draw a graph indicating the number for every year, and establish if there has been an increase or decrease in the number of people who left the country.

RESEARCH
Conduct research on one of the following types of migrants:
- slavery
- migrant labourers
- students

1.3.6 Assessment

Learning Outcomes (LOs)
LO 1
Geographical Enquiry
The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

Assessment Standards (ASs)
This is seen when the learner:
1.2 interprets information from maps and atlases and from graphic and statistical
1.5 identifies and records information in the specific field [working with sources];
1.7 in various ways reports knowledge obtained during the study by formulating an argument based on information found; uses maps, diagrams and graphics; uses, where possible, computers in the presentation [putting the answer across].

LO 2
GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING
The learner will be able to demonstrate geographical and environmental knowledge and understanding.

This is clear when the learner:
2.1 identifies and compares various kinds of settlement patterns [people and places];
12.2 identifies factors that influence the formation of settlement patterns (natural, economic, social/political) [people and resources];
2.3 identifies crucial factors leading to changes in settlement patterns in South Africa, Africa and elsewhere [people and environment].

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
1.3.7 Memorandum

ACTIVITY 1

- Emigration abroad.

The scarcity of jobs.
- The safety situation in South Africa.
- Farm murders.
- Increased wave of violent crimes in South Africa, etc.

ACTIVITY 2 and 3

Own answers!

ACTIVITY 4

Own research.

1.4 Transport

1.4.1 Social Sciences

1.4.2 Grade 8

1.4.3 GEOGRAPHY: SETTLEMENTS

1.4.4 Module 5

1.4.5 TRANSPORT

1. Improved means of transport

In the years before factories started to mass produce goods in large quantities, people worked on a smaller scale, either at home or in smaller buildings. They used to walk to work and therefore lived as close to work as possible. Towards the middle of the 19th century (about 1825 - 1875) the industrial revolution took place; machines were manufactured, the first motor cars were assembled and factories were erected. Means of transport were developed, and soon it would not only be cars, but also trams, steam trains and eventually electric trains, tube trains, buses and fast cars. People could suddenly live further away from the workplace, which meant that the boundaries of towns and cities were expanding rapidly. This had a big influence on the inside and outside appearance of the city, e.g.

The workplace and living areas gradually became further removed from each other;
- various types of living areas (upper class, middle class and working class) and working areas (office blocks and shops in the centre of town; factories on the outskirts of town) sprang up;
- tall buildings were erected in city centres or the centre of towns, because this was where everyone wanted to be; land became more expensive and people started building “on top of other buildings” (storeys); a new method of transportation, the elevator, came into use;
- roads and railway lines were constructed and people erected their homes and businesses alongside so that towns and cities began to take on different shapes if viewed from the top;
- large areas of towns/cities have tarred surfaces for parking, streets were widened and concrete jungles developed;
- many of the functions in the centre of town (CBD - Central Business District), such as cinemas, bigger shops, offices, etc. have relocated to the suburbs. Large shopping centre complexes, such as Tyger Valley Centre and Eastgate were built and accommodate a large number of functions under one roof. One stop shopping conveniences with ample parking areas and less traffic draw large numbers of people every day.
- the city suddenly started expanding in almost all directions, making it difficult to say what shape a city is taking on. Most cities have no particular shape.

This content is available online at: \(<http://cnx.org/content/m21524/1.1/>\).

Available for free at Connexions \(<http://cnx.org/content/col11036/1.1/>\).
2. What impact does this development have on the people in our country?

We already know that cities are enormously popular and that literally thousands of new residents move to bigger towns and cities, some because they have been transferred and already have work, and others in the hope of getting a job to earn a better living. Let's try to form an image of the effects of the huge expansion of towns and cities:

People move to city surroundings for various reasons. It is estimated that between 10 000 and 15 000 new residents move into the larger Cape Town area every month. Some of them (a small group) have jobs, have been transferred or feel like a change of surroundings and are usually financially sound. Most of them, however, hope to find work and make a better living. We start by focussing on this group;

when they arrive, most people have no work or a place to live. They therefore move to the outskirts of the city where they erect informal structures. This was the beginning of gigantic town areas such as Khayalitsha, Crossroads, Guguletu, Soweto, etc.;

because these people have no money or jobs, they live in squalor. There are no proper sanitary amenities, nor do they have access to clean water or washing amenities. Above all, they are hungry, and a hungry person will do anything for food, even steal, if need be;

this leads to the escalation of crime. Unemployed persons stay at home during the day while others go out to work. Those who work are robbed in day-time, while at night they are confronted by gangs who rob them of their money;

as the informal towns are mostly unplanned, the people are exposed to natural elements, such as storms and gales etc., and their homes are often flooded after heavy rainfall;

to keep warm, they have to make a fire, and to cook, they use gas or primus stoves that work with paraffin and are highly inflammable. Often we hear and read about big fires in the informal settlements, ... hundreds of huts going up in flames – people often die, while many lose all their possessions;

those who have jobs must catch a morning train, bus or taxi (a new industry that has originated as a result of the shortage of transport) and as the workplace might often be very far from where they live, they have to leave their homes very early in the morning, arriving back home late at night. This means that their own children, who stay by themselves all day, are neglected.

many youngsters and children beg on the streets of the city centre. Children do not attend school, but live on the streets, sleeping on verandas in front of shops, while others try to build informal shacks of plastic and bagging on any available open spaces. They are often found on the traffic islands along the main roads and on the freeways and under the bridges;

motor vehicles also contribute to air pollution in the city and a large part of the brown blanket of air that we often see above the city, comes from exhaust fumes of motor vehicles;

those who are financially well-off, can afford houses, live in one of the suburbs, and drive to work in their private cars.

One's financial position therefore determines what type of transport one uses, which again influences where one lives and works.

Those who can afford it, mainly use their private cars and/or rely on lift clubs to get to and from work. This means that they are able to buy a house wherever they wish.

The poor and the needy have no choices. If they do not live within walking distance from their work, they have to live close to a bus stop or station in order to get to work in the morning, otherwise they have to walk. It is surprising to see how many people walk long distances to work every day, because they cannot afford any form of transport.

1.4.5.1 Activity:

1.4.5.2 To obtain information by means of surveys

1.4.5.3 [LO 1.7]

This section on modes of transport can be done by means of local surveys, executed by the learners themselves, e.g.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
1. Make a survey of how learners in your class get to school. Draw an evaluation grid and write the different kinds of transport at the top, e.g. bus, train, private car, walk, etc.

2. Make a second survey and establish the approximate distances that learners live from school and compare it with the means of transport that they use.

   Let individual learners each draw their own evaluation grid and do a survey at their parents’ homes on the following aspects: where they work, how they get to work – different kinds of transport, lift-clubs, etc.

   Conduct a survey amongst the workers at school to establish where they work and how they get to work. Ask questions such as: At what time in the morning do you leave home? At what time do you arrive back home? How do the children get to school? etc. Compare the different sets of information with one another – what do you find?

3. Make a list of problems that people living in big towns and in cities experience in relation to traffic, e.g. traffic jams; time lost due to getting stuck in slow traffic; poor means of transport in lower socio-economic areas; dangers on trains running to the suburbs, etc. (Do on separate fullscap paper and add to module.)

   Identify the THREE biggest or most serious problems. Divide the class into THREE groups, each group taking one problem through the stages of problem solving. Suggest possible solutions and give some kind of presentation in class...

   Hold a class/panel discussion on the impact of means of transport in the lives of people of different socio-economic groups.

1.4.6 Assessment

Learning Outcomes (LOs)

   LO 1

   Geographical Enquiry

   The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

   Assessment Standards

   (ASs)

   This is seen when the learner:

   1.2 interprets information from maps and atlases and from graphic and statistitical
   1.5 identifies and records information in the specific field [working with sources];
   1.7 in various ways reports knowledge obtained during the study by formulating an argument based on
   information found; uses maps, diagrams and graphics; uses, where possible, computers in the presentation
   [putting the answer across].

   LO 2

   GEOGRAPHICAL KNOWLEDGE AND

   UNDERSTANDING

   The learner will be able to demonstrate

   geographical and environmental
   knowledge and understanding.

   This is clear when the learner:

   2.1 identifies and compares various kinds of settlement patterns [people and places];

   12.2 identifies factors that influence the formation of settlement patterns (natural, economic, social/political) [people and resources];

   2.3 identifies crucial factors leading to changes in settlement patterns in South Africa, Africa and elsewhere [people and environment].

1.4.7 Memorandum

ACTIVITY:

Class project.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
1.5 Land use patterns

1.5.1 Social Sciences

1.5.2 GEOGRAPHY: SETTLEMENTS

1.5.3 Module 1

1.5.4 LAND USE PATTERNS

The origin and functions of settlements differ. We shall take a brief look at the different types of land use in a town or city in South Africa.

South Africa has some densely populated urban areas. These include areas such as Gauteng and the Cape Town City Metropole. The Nelson Mandela Metropole which includes Port Elizabeth, Uitenhage and Despatch, is another densely populated area. On the other hand there are certain parts of the country where the population is very sparse. Do you know of any such areas? .......... The Northern Cape Province perhaps? In some of these country towns the population is in fact decreasing. This is partly due to the depopulation of the rural areas, resulting from the pulling and pushing factors that you have already studied.

In a small town like Hofmeyr in the Eastern Cape, there are only about five hundred inhabitants. Many businesses in this town have already closed down. There is not enough spending power left to make businesses profitable. Even banks have already closed their doors. This also influences the prices of houses. Prices have dropped considerably over the last few years. Many home-owners cannot find buyers for their homes. They practically have to give their homes away.

1.5.4.1 Activity

1.5.4.2 To interpret information from sources and answer questions that arise from this knowledge

1.5.4.3 [LO 2.1]

1. Why do you think certain urban areas are expanding, while others (especially in rural areas) stagnate?
2. Define the term “depopulation.”
3. What kind of problems do property owners in rural areas experience where the population of small towns is dwindling?
4. Do you think there is a relationship between the depopulation of the rural areas and the pressure on urban areas to supply housing and an infrastructure?

1. Different land use zones in the city

If you study a map of any town or city, it becomes clear that not all the land is used for the same purposes. There are various functions to be fulfilled in any particular town or city, and these take place in different areas. Industries, for example, are usually found on the outskirts of a city, while the head offices of large organisations are likely to be in the central business district.

As any city has different needs, there are different kinds of businesses, institutions or persons to supply in these needs. Just think of sport for a moment. Which amenities in your area cater for sport? Cities also have many other functions. Let’s have a look at some typical land use zones in the city:

1.1 Central Business District (CBD)

The Central Business District is the heart of any city and its function is commercial. All cities have such an area. The location of the CBD usually offers easy access to all the main traffic routes. The price of land in the Central Business District is usually exceptionally high, so that most buildings in this area are very tall. In the course of time, as the city expands, the CBD of any given city may move to a new location. In Port Elizabeth for example, the CBD was once close to the harbour. The area has since moved to Cape Road, which is further away from the original CBD.

\[\text{This content is available online at } \text{http://cnx.org/content/m21517/1.1/}.\]

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
1.2 Wholesalers

Wholesalers supply goods to retailers. The public cannot buy directly from the wholesalers. They only supply stock to the smaller shops. Wholesalers usually have larger businesses with ample storage space. The products are stored on ordinary shelves, with very little attention to advertising, display and decoration.

- **Flats and lower status housing zone**

This zone is usually distinguished by blocks of flats or smaller houses on small plots. Think of Hillbrow in Johannesburg, for example. The buildings might sometimes appear old and dilapidated, giving the area a lower status. In earlier days these neighbourhoods usually enjoyed a higher status. With the development of other neighbourhoods with newer houses, many residents moved out. Now the original flats or houses are inhabited by people with a lower income. This is the reason why the zone is called a transition area.

1.4 Medium-status housing zone

Resident living in this zone usually fall in the middle-income group. This means that they earn more than those who make use of lower-status housing. However, these people still prefer to live near the workplace.

1.5 High-status housing zone

This zone is usually found on the fringe of the city. It consists of big houses on large plots. Sometimes the plots are big enough so that the owners can keep horses and other animals. The residents fall in the high-income bracket. They find it more important to live in attractive, peaceful surroundings than close to work. Time spent on travelling is of no consequence.

1.6 Large industries

Large industries are also found outside the city boundaries. Mostly this is because industries need larger premises, and they are not located near residential areas due to factors such as possible noise and air pollution. Land is also cheaper on the outskirts of the city, while also offering more land for future expansion.

1.7 Rural-urban seam

The rural-urban seam is a zone where urban land use is slowly encroaching on the area. Initially it forms the border between urban and rural areas. Although rural activities such as dairy farming may still occur, these tend to decrease, making way for other types of land use.

1.5.5 Assessment

1.5.6

**Learning Outcomes (LOs)**

**LO 1**

**Geographical Enquiry**

The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

**Assessment Standards (ASs)**

*This is seen when the learner:*

1.2 interprets information from maps and atlases and from graphic and statistical

1.5 identifies and records information in the specific field [working with sources];

1.7 in various ways reports knowledge obtained during the study by formulating an argument based on information found; uses maps, diagrams and graphics; uses, where possible, computers in the presentation [putting the answer across].

**LO 2**

**GEOGRAPHICAL KNOWLEDGE AND UNDERSTANDING**

The learner will be able to demonstrate geographical and environmental knowledge and understanding.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
This is clear when the learner:

2.1 identifies and compares various kinds of settlement patterns [people and places];
2.2 identifies factors that influence the formation of settlement patterns (natural, economic, social/political) [people and resources];
2.3 identifies crucial factors leading to changes in settlement patterns in South Africa, Africa and elsewhere [people and environment].

1.5.7 Memorandum

ACTIVITY 1:

- Urban areas expand as a result of economic and other developments taking place in the vicinity. This in turn creates jobs and other opportunities, causing people flock to these areas. As opposed to this, other areas stagnate or even deteriorate when there is a decline of the economy and services are terminated. In this instance people have no choice but to leave the area.

A process where the population leave a particular area to settle permanently in another areas. Hence the number of inhabitants decreases. This process has a snow-ball effect, as it becomes almost irreversible once it has started.

People struggle to sell their properties. As properties do not fetch what they are worth, people often lose a lot of money in an effort to sell. It might take so long to find a buyer that properties are eventually “given away” at ridiculously low prices.

Definitely!

Each urban area is designed to accommodate a certain number of inhabitants. Although these areas do expand, but growth goes hand in hand with thorough planning. As urban areas do not always make provision for the depopulation of rural areas, the rise in numbers places an unnecessary burden on infrastructure and urban services such as the provision of electricity, water, sewage, refuse removal and public transport.
Chapter 2

Term 2

2.1 The sustainability of natural resources

2.1.1 Social Sciences:

2.1.2 GEOGRAPHY

2.1.3 Grade 8

2.1.4 NATURAL RESOURCES

2.1.5 Module 6

2.1.6 THE SUSTAINABILITY OF NATURAL RESOURCES

a) What is meant by “sustainability”?

Sustainable development refers to the carefully planned utilisation of natural resources. The goal of conservation cannot be achieved without development to alleviate the poverty and misery endured by hundreds of millions of people all over the world. Development is essential for raising the standard of living of all people, which would in turn enable them to realise their potential, enjoy healthy and dignified lives, and to guarantee the well-being of future generations.

But this development must be responsible and wise. It must be directed and controlled, taking full account of the needs of the present and future generations. It must go hand in hand with conservation, allowing the fullest coexistence between humans and nature.

Humankind depends on nature to maintain and sustain life. Nature provides us with air, water and food, and supplies whatever we need for housing, transport, job opportunities and recreation. Some of these resources however, such as minerals and fossil fuels, are finite and hence non-renewable. These substances, which are formed over millions of years, will eventually run out if we continue exploiting them at current rates.

b) The South African context

South Africa is a unique country with unique problems. The developed sector of the population has been responsible for some of the most serious environmental destruction known to mankind. Air pollution in Mpumalanga is said to be as bad, or even worse, than the most heavily polluted industrialised parts of Eastern Europe. Taking income and population into account, South Africa is the world’s highest emitter of carbon dioxide.

Also South Africa’s developing sector is responsible for huge environmental degradation. Political policies of the past had tragic implications for the environment, such as widespread soil erosion in KwaZulu, Transkei and many other areas, and a loss of vegetation through overcrowding and overstocking.

\(^1\)This content is available online at <http://cnx.org/content/m21519/1.1/>.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
South Africa nevertheless has a record unique in Africa for protecting its wildlife resources. Its big game, which at one stage was threatened by extinction, has been relocated to various areas. South African expertise in this field is now universally acknowledged. Far-reaching steps have been taken to protect the country’s unspoilt nature and wilderness areas (although some of these measures were applied in an autocratic way, ignoring the interests of local communities).

Large tracts of land and numerous precious ecosystems have been damaged, degraded and destroyed. In the Tugela Basin in KwaZulu-Natal more than 90 per cent of the original wetland has been destroyed. The quagga is extinct. The wattled crane can follow soon. Every year millions of tons of precious topsoil are washed away during the rainy season. Taking everything into account, the ability of South Africa’s environment to provide for its people and other forms of life has taken a severe knock.

Widespread poverty – and often chronic poverty – must be eliminated, as it is one of the main causes for environmental destruction in South Africa. In many parts of the country impoverished communities are battling to survive. In such circumstances environmental ethics are often considered irrelevant and conservation concerns written off as an unnecessary luxury in the never-ending struggle for survival. People are sometimes even forced to eat the seed corn of the next year’s crop. Environmental degradation is seldom deliberate, but eventually the increasing number of humans in a limited area exacts an environmental toll. Trees are chopped down and grasslands and soil are destroyed, while water sources are polluted – ironically enough, the very fabric on which people depend for their survival.

The flip side of the coin is the effect of extravagant lifestyles that are not sustainable. Such practices often go hand in hand with wastage and widespread pollution. Precious water, often purified to exacting drinking standards at great expense, is used to run to waste on huge (exotic) suburban lawns. Municipal landfill sites overflow with waste products of the throw-away consumer society. Greed, over-consumption and corruption are widespread and became, if not morally acceptable, an unquestioned way of life in some sectors of the community.

Under this twin onslaught of poverty and excess, South Africa’s natural resource base is crumbling and its biological diversity is dwindling. The devastating long-term effect of environmental neglect is a bankrupt nation with little hope of ecological and economic recovery.

c) What is meant by biodiversity?

Biodiversity describes the vast wealth of life-forms on Earth:
The millions of micro-organisms, animals and plants, all the genes they contain, and the intricate ecosystems they function in, which together form the “living world.”

These plants and animals, continuously evolving over millions of years, have made the planet fit for human habitation.

They help maintain the chemical balance of the earth, and stabilise the weather and climate.

Apart from all other uses, they supply all our food and many of our raw materials and medicines.

d) Ecological systems

An ecosystem is the living and non-living components of any given environment and the interaction among the components.

A study of ecosystems and the interaction between organisms and their environment is called ecology.

A representation of different ecological environments

2.1.7 Assessment

Learning Outcomes (LOs)

LO 1

Geographical Enquiry

The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

Assessment Standards (ASs)

We know this when the learner:

1.1 identifies and selects a variety of geographical and environmental sources relevant to an enquiry [uses fieldwork and other enquiry methods; finds sources];
1.2 interprets maps and atlas information, graphical and statistical sources [works with sources].

**LO 3**

**Exploring Issues (social and environmental)**

The learner will be able to make informed decisions about social and environmental issues and problems.

*We know this when the learner:*

3.3 investigates possible ways of reducing resource consumption [makes choices].

### 2.2 Energy and water

#### 2.2.1 Social Sciences:

#### 2.2.2 GEOGRAPHY

#### 2.2.3 Grade 8

#### 2.2.4 NATURAL RESOURCES

#### 2.2.5 Module 7

#### 2.2.6 ENERGY AND WATER

**Energy**

In general terms, energy use in South Africa is inefficient and unsustainable. The country’s estimated share of two per cent to the world’s carbon dioxide production is a disproportionately high contribution to global warming and human-induced climate change. According to the United Nations, on a per capita basis South Africa is the world’s third highest emitter of carbon dioxide. The country should therefore not strive towards generating and selling more power, as it would lead to more pollution. We should rather manage the demand, so that overall consumption is reduced.

More than three quarters of South Africa’s energy is derived from coal, making the country’s dependence on this non-renewable resource one of the highest in the world. However, South Africa has huge coal reserves of more than 58 000 tonnes. About half of the coal mined in South Africa is used to generate electricity. A quarter is used to produce synthetic liquid fuels through the Sasol process, while another quarter is burnt directly by industry or in homes to provide heat.

All the big coal-fired power stations are situated within a 150 km radius of the major coal mines in Mpumalanga. The result is air pollution that some scientists suggest is equal to the worst in the world.

Air pollution poses extremely serious environmental consequences, as a substantial amount of South Africa’s agriculturally productive land and commercial forests, as well as about 25 per cent of its surface water run-off also occur within this region. Direct coal burning by industry and in townships without access to electricity, is also responsible for substantial pollution, resulting in environmental and health problems.

#### 2.2.6.1 Activity 1:

#### 2.2.6.2 To explain concepts relating to energy

#### 2.2.6.3 [LO 1.1]

1. Identify the three natural resources which, according to the text, are not utilised in a sustainable way, and describe their meanings:

2. Why do half of South Africa’s population rely on fuel-wood as a source of energy?

3. Explain the following:
   - Synthetic fuel
   - Global warming

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2This content is available online at [http://cnx.org/content/m21518/1.1/].

Available for free at Connexions [http://cnx.org/content/col11036/1.1]
Sustainability

Human-induced climate change

A major environmental problem is the fact that an estimated half of South Africa’s population currently still rely on the non-sustainable use of fuel-wood for their energy requirements. If current consumption rates continue, all natural woodlands in the former 'homeland' areas could be denuded by 2020.

Although nuclear power does enjoy some support, electricity generated at the Koeberg power station is more expensive than other power in the national network.

Moreover, a number of major environmental and social problems relating to the disposal of dangerous nuclear waste have not yet been solved.

2.2.6.4 Activity 2:

2.2.6.5 To find ways to reduce the use of resources

2.2.6.6 [LO 3.3]

1. Discuss the following statement:

More emphasis should be given to the provision of efficient and accessible public transport, while there should be incentives for making less use of private transport.

Key words: air pollution, fuel consumption (wastage and conservation), maintenance of roads; environmental destruction.

2. Discuss the following statement:

Solar-powered geysers should be made compulsory.

Explain what you understand under solar heating.

How does solar heating work?

For what purpose can solar heating be applied?

Is it less or more expensive than electricity?

Water

All life on Earth depends on water. South Africa is an arid country and water is the most important factor limiting future development. Yet the productivity and diversity of this country’s vital fresh water systems were allowed to deteriorate, or even to be destroyed.

Reasons for the above include unwise aforrestation, agricultural development, industrial and municipal pollution, urbanisation, the introduction of alien species, and the clearing of natural vegetation.

While the water supply in most formal urban areas is of high quality and effective water-borne sewage systems are the norm, many people in both rural and informal settlements do not have adequate access to water. Where water is available, the poor quality often causes serious health problems.

Most South African rivers are impounded or regulated at one or more points along their length, radically altering their ecological status. So much water is now extracted from previously perennial rivers, such as the Letaba and Levuvhu (supplying water to the Kruger National Park), that they have ceased to flow for long periods, despite good rains.

The demand for water is still increasing exponentially and it is estimated that huge parts of South Africa will experience a permanent drought somewhere between 2002 and 2040. It is obvious that water conservation measures must be implemented in all spheres of life as a matter of urgency.

2.2.6.7 Activity 3:

2.2.6.8 To inform and educate people about the importance of water conservation

2.2.6.9 [LO 3.3]

1. Plan an efficient advertising campaign to inform the public about the necessity of water conservation and the sustainable use of water.

First decide on what kind of people you are going to target (rural or urban people; any other specific groups?).

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
Decide which media you are going to use (radio, TV, magazines, newspapers, posters, a play, poems, songs, a calendar, etc.)

When you have clarity on the above, you can decide on the content (of the text of copy which you are going to write) and visual material or costumes and props (which you might also like to make yourself) to bring the message across.

2. Plan an educational programme to make learners in grade 1 aware of the need for water conservation. If possible, implement the programme yourselves, or pass it on to learners in other classes or schools, and write a report to evaluate their efforts.

Wetlands play an important role in maintaining biodiversity. These systems also serve as an important source of water for many rural communities. However, many wetlands have been reclaimed or affected by drainage programmes for agricultural crops, the production of wood, or by filling up the area for roads and houses.

### Activity 4:

#### To make people aware of the importance of wetlands

**[LO 3.3]**

Wetlands play an important role in maintaining biodiversity. These systems are also an important water source for many rural communities. Despite this many wetlands are drained or disturbed by drainage programmes relating to agricultural crops, wood production and reclaiming land for roads and houses.

1. What is a wetland? See how much you can find out.
2. Why is it important to protect wetlands?

### Assessment

**Learning Outcomes (LOs)**

**LO 1**

**Geographical Enquiry**

The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

**Assessment Standards (ASs)**

*We know this when the learner:*

1.1 identifies and selects a variety of geographical and environmental sources relevant to an enquiry [uses fieldwork and other enquiry methods; finds sources];

1.2 interprets maps and atlas information, graphical and statistical sources [works with sources].

**LO 3**

**Exploring Issues (social and environmental)**

The learner will be able to make informed decisions about social and environmental issues and problems.

*We know this when the learner:*

3.3 investigates possible ways of reducing resource consumption [makes choices].

### Memorandum

**Activity 4:**

1. These are low-lying areas with ample water. It is a complex ecosystem on its own, boasting a wealth of plant and animal life.

2. Wetlands form a unique ecosystem and needs to be protected.

Wetlands serve as a “sponge” to absorb superfluous water.

For the protection of biodiversity.

Accommodates a large variety of plant and animal species.

Community interest.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
2.3 Agriculture, forestry and alien plants

2.3.1 Social Sciences:

2.3.2 GEOGRAPHY

2.3.3 Grade 8

2.3.4 NATURAL RESOURCES

2.3.5 Module 8

2.3.6 AGRICULTURE, FORRESTRY AND ALIEN INVADERS

Agriculture
The greatest damage that humans inflict on the earth – and by implication, the greatest threat that humanity poses to its own future survival – is through the practice of agriculture. Huge areas of the planet’s natural terrestrial ecosystems have already been destroyed and replaced with artificial agricultural systems, greatly reducing or even negating the ability of the land to control and influence its own climate and chemistry.

Of South Africa’s surface area of some 120 million hectares, about 85 per cent is used for agriculture and forestry. Only 45 per cent of the country receives more than 500 mm rain annually – the generally accepted minimum for dryland crop production – and only 12 per cent is suitable for cultivation. The rest is mainly natural veld used for grazing.

Because of the lack of suitable planning in the past and gross over subsidisation – often to win political favour – much prime arable land has been irrevocably lost to urbanisation, mining (particularly on the Witwatersrand and in Mpumalanga) and other activities. Also, injudicious management and cultivation of crops not ecologically suited to conditions have caused widespread degradation in the form of soil erosion and desertification. Annual soil losses, mostly through poor land husbandry practices, are estimated at between 300 and 400 million tonnes annually.

The question of existing land ownership in agriculture is being addressed as a matter of urgency by the Government of National Unity. Before the 1994 elections, an estimated 50 000 white farmers – many of them heavily subsidised for political reasons and extensively in debt to an amount of R14 billion – owned some 85 million hectares, of which about 14,3 million were arable. The 700 000 black farmers in the former “homeland” areas had access to only some 15 million hectares, of which only 2,3 million were arable.

2.3.6.1 Activity 1:

2.3.6.2 To identify the poor management of agricultural land and suggest precautionary measures

2.3.6.3 [LO 3.3]

1. Underline the correct words. Explain your choice.

- Livestock must be **decreased/increased** to remain within the capacity of the land.

- The simultaneous cultivation of crops and the keeping of livestock must be **encouraged/discouraged**.

2. Why is it necessary that the use of fertilizers, insecticides and weed killers should be strictly controlled? Give your opinion.

3. In what respect does urbanisation contribute to the destruction of agricultural land?

Forestry

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3This content is available online at [http://cnx.org/content/m21520/1.1/](http://cnx.org/content/m21520/1.1/).

Available for free at Connexions [http://cnx.org/content/col11036/1.1/](http://cnx.org/content/col11036/1.1)
Forests are an integral part of Earth’s life-support systems, playing a crucial role in regulating the atmosphere and climate through their ability to store carbon and drive local hydrological cycles. They protect soils from excessive erosion, regulate run-off and reduce the effect of floods and consequently silt loads in rivers. Natural forests are usually highly diverse ecosystems, supporting millions of species and providing human beings with a wealth of benefits. They are also an important part of the resource base for tourism and recreation, and have an inestimable cultural value as a source of beauty, contemplation and inspiration that finds expression in art, music, literature, dance and religion.

Unfortunately, forests everywhere are under increasing pressure from pollution and acid rain (although there are some doubts in this regard), unsustainable logging, the gathering of fuel-wood, bark stripping for traditional medicine, and clearing for agriculture and urbanisation.

In South Africa, indigenous evergreen forest is the smallest and most widely dispersed of the country’s seven major biomes, and covers just 0.25 per cent of the land surface. With the arrival of the European settlers in the 17th century, these forests were heavily exploited, with many areas being completely destroyed or reduced to scrub. The remaining state-owned indigenous forests, particularly those in the southern Cape, are now carefully managed for sustainable yields of timber like yellowwood, stinkwood and ferns, although there is major concern in several areas about alien plant invaders and the encroachment of exotic species. Other indigenous forests in private hands are mostly not adequately protected and are rapidly diminishing.

As a result, ecosystems have been degraded, biodiversity reduced, soil eroded and valuable water resources wasted.

South Africa is an important exporter of especially pine, wattle and blue gum timber.

2.3.6.4 To investigate ways to reduce the exhaustion of timber as a resource

2.3.6.5 [LO 3.3]

1. Suggest an alternative substance from which each of the following products could be manufactured:

- Bottle corks (tree bark)
- Rayon material
- Wooden planks for the manufacturing of furniture
- Sawdust
- Paper
- Sleepers (rails)
- Wooden boxes (fruit)
- Pencils

2. Which functions performed by trees (forests) as a life-sustaining system cannot be replaced by anything else? (See par. 1)

2.3.6.6 Activity 3:

2.3.6.7 To indicate the most important forestry areas on a map

2.3.6.8 [LO 1.1]

- Draw an outline map of the RSA. Consult an atlas and fill in the most important forestry areas on the map.

Alien plant species

South Africa’s natural environment has already been invaded by more than 100 species of alien fauna and flora. It has caused widespread ecological damage and incurred losses to the value of several millions of rand in respect of lost agricultural potential and other land uses. Moreover, the extermination of alien species is a costly and time-consuming process.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
The alien plants that have spread fastest over the past decades, eating into hundreds of thousands of hectares, include hakea, Australian Acacia, the Mauritius-thorn, paraffin-bush, lantana, water-lily, nasella tussock, various types of pine, and the jointed cactus.

Alien fish species such as trout and bagger have already eliminated the indigenous fish of various river systems, while extinct bird species such as the European starling and Indian myna birds have become a nuisance in urban and possibly rural areas. Their exact numbers, however, are not known. Alien rats and mice are problem animals in human settlements, while the Argentine ant is a threat to South Africa’s fynbos as it eliminates the seed-dispersing indigenous ant.

South Africa’s most precious water resources are also badly affected by alien plants. River-bank habitats are particularly vulnerable to invasion and many of the upper and middle river courses have almost been completely overgrown with dense patches of silver and black wattle trees (Acacia species).

In fynbos-areas the water balance of mountain catchment areas have been upset by dense patches of alien plants, thus creating a far bigger fire hazard than the natural vegetation.

All seven of the most important biospheres are threatened by alien plants, with fynbos, savannah and wooded areas being affected most severely. Up to now efforts to kerb alien plants in the formal conservation areas of the sub-continent have met with varied success, when directed at alien trees and shrubs. Invasion by weeds and grasses are mostly ignored and little ecological information is available on this problem.

2.3.6.9 Activity 4:

2.3.6.10 To do research on alien species and put the findings into writing

2.3.6.11 [LO 1.2]

The eradication of alien species is a costly and time-consuming process.

1. Write short notes on one alien plant and one alien animal found in your area.
   a) Alien plant
   b) Alien animal

Some alien plants

Jointed cactus

Invasion by the jointed cactus hinder farming activities and cause the value of the land to depreciate. It diminishes the grazing potential of the veld.

Animals can become covered with sores and ulcerations as a result of the barbed thorns hooking into their flesh.

Oleander

Parts of the plant are poisonous for humans, birds and other animals.

Early signs of poisoning include sweating, loss of appetite, nausea, vomiting, dizziness, stomach cramps, etc. Serious cases can lead to death due to heart failure or paralysis of the respiratory system.

Port Jackson

The Port Jackson was originally planted to bind the sand on the Cape Flats.

The bark of the trees was initially used for the tanning of leather, but was later replaced by better types of bark.

The wood of the Port Jackson is softer and weaker than that of Rooikrans, which is a better sand-binder.

Lantana

This alien plant is so aggressive in the warmer regions of the Cape that it can choke trees of 10 metres in height.

Invasion in plantations hamper forestry activities. Animals eating the leaves may die.

Poisoning in humans may cause kidney failure, leading to death within three weeks.

Rooikrans

Rooikrans forms thick, impenetrable stretches of large shrubs or low trees with entangled crowns.

They cause a serious problem, as the germination suppresses the growth of indigenous plants, causing them to disappear.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
2.3.7 Assessment

Learning Outcomes (LOs)

LO 1
Geographical Enquiry
The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

Assessment Standards (ASs)

We know this when the learner:
1.1 identifies and selects a variety of geographical and environmental sources relevant to an enquiry [uses fieldwork and other enquiry methods; finds sources];
1.2 interprets maps and atlas information, graphical and statistical sources [works with sources].

LO 3
Exploring Issues (social and environmental)
The learner will be able to make informed decisions about social and environmental issues and problems.

We know this when the learner:
3.3 investigates possible ways of reducing resource consumption [makes choices].

2.3.8 Memorandum

ACTIVITY 1

1. REDUCES: Carrying capacity refers to the number of sheep or stock that can graze successfully and sustainable on a hectare of land. Livestock must be reduced to be in line with the carrying capacity of the land. This will protect the land against overgrazing and prevent eventual soil erosion and desertification.

ENCOURAGED: Diversified (mixed) farming should be encouraged in areas with sufficient rainfall. This will prevent that farmers rely solely on one type of farming, and suffer financial losses when prices go down. It also helps to combat the exhaustion of the soil.

2. If these substances are used correctly (scientifically), it can help to increase production, which is to the advantage of the farmer and his land. Irresponsible and uncontrolled application of the said substances can result in the destruction of ecosystems and the poisoning of water resources, so that the land may become completely unproductive.

3. Urbanisation results in a rapid growth of the population in urban areas. This in turn causes a large demand for housing areas and commercial sites, the result of which is deforestation, or even the impingement on precious agricultural land, as urban areas expand towards the outskirts of towns and cities.

ACTIVITY 2

1. Bottle corks: Synthetic corks are already being used on a wide scale

Rayon material: Natural fibres
Wooden planks: Hardened synthetic material – will be difficult
Wooden sawdust: Cottonwool and synthetic fibre or wool fibre
Paper: Impossible – recycling necessary
Sleepers: Concrete
Wooden boxes: Cardboard that can be recycled
Pencils: Plastic-covered graphite

Wetlands form a unique ecosystem and has to be protected.
Wetlands act as a “sponge” to absorb surplus water.
To maintain biodiversity.
Accommodates a large variety of plant and animal species.
Interest of the community.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
2. Trees and woods play an essential role in the regulation of atmospheric and climatic processes.
It stores carbon and keeps local water cycles intact.
Stabilises soil (compact) against erosion.
Reduces the impact of floods.
Maintains species – ecosystem.
Tourism and recreation.

ACTIVITY 3
Answer will depend on area where you live.

2.4 Marine resources and the coastal zone

2.4.1 Social Sciences:
2.4.2 GEOGRAPHY
2.4.3 Grade 8
2.4.4 NATURAL RESOURCES
2.4.5 Module 9
2.4.6 MARINE RESOURCES AND THE COASTAL ZONE

Marine Resources
The oceans are the dominant feature of Earth which is aptly named the “blue planet”. They cover more than two thirds of its surface and play a crucial role in the hydrological cycle, the chemistry of the atmosphere, and the shaping of climate and weather. Although the oceans are so vast, their true biological wealth is concentrated in a relatively narrow strip along the continental shelves (with a maximum depth of about 200 m), coastal margins and estuaries. These include the major fishing grounds which produce more than 80 per cent of the world’s fishing catch, among the most important sources of nutrition for tens of millions of people. South Africa ranks 24th among the world’s fishing nations, with more than 90 per cent of its annual catch (worth more than R1 billion annually) being taken in the highly productive cold waters off the west coast.

Both international and in South Africa little formal attempt has been made to manage the sea for multiple use; former and existing regulations have focused primarily on the exploitation of commercially valuable marine resources. Unsustainable fishing is the main threat to living marine resources, which in the past were frequently over-exploited. Some fish populations, like the pilchards off the coast of Namibia, have yet to recover. During the past decade, South African authorities have applied a quota system within a Total Allowable Catch (TAC) for each of the various commercial species, as well as closed seasons and minimum size limits, as a means of achieving the sustainable utilisation of fishing resources.

Under South Africa’s old order, the traditional access to marine resources by fishing communities – “those who get their hands wet”, as the fishermen say – was gradually removed, with preference being given to major companies controlled by large shareholders.

- A few years ago the Western Cape government decided to introduce fishing quotas by means of legislation. This met with severe resistance amongst various communities. Two of the many responses in local newspapers are cited below:

Fish on the verge of extermination
It was with shock that I read an article in Die Burger of 18 April on the collapse of line-fish in our waters. Eight line-fish species are presently being caught faster than they can breed.

---

4This content is available online at <http://cnx.org/content/m21521/1.1/>.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
According to the report of Dr. Marc Griffiths of Marine and Coastal management, licence holders will have to be reduced in order to save the fish industry.

The report mentions that galjoen, Cape salmon, white steenbras, witstompeens and dark kabeljou are being caught faster than they can breed, and that the elf has already been overexploited. Apparently the dageraad has almost become extinct.

To save the fish resources from complete extinction, stricter measures will have to be applied.

Sacrifices will have to be made by rock- and beach anglers, as well as by coastal net and trailer-owners. Additionally, the Government will seriously have to think about appointing more law enforcement officers, with a view to enforcing the regulations on the conservation of Marine and Coastal management, and applying them properly.

Foreign fish trailers will have to be prohibited from fishing within the 200 km territorial waters of South Africa, and no fish quotas should be allocated to them.

Beach-net owners should be forbidden to fish for at least two years. If they are indeed allowed to continue fishing along the coast, their nets should drastically be shortened to 100 m, without a bag in die net. Coastal nets exterminate large numbers of undersized fish.

Rock and beach anglers, of whom I am one, will also have to make sacrifices if we wish our descendants to enjoy the privilege of fishing.

The daily fishing quota of anglers and fish trailers should be reduced drastically. An angler should not catch more than five fishes per day.

More coastal reserves should be established, allowing fish to breed freely. Scientific studies should determined which parts of the coast would be most suitable to serve as reserves.

To my mind the whole of False Bay should be out of bounds for trailers, as was the case in the past.

According to the report of Dr. Griffiths (in table seven) eighteen fish species have already become totally extinct as a result of over-exploitation. It really seems to be a bleak day for the fishing industry.

Everybody will have to make sacrifices if we do not see ourselves going to museums one day to show our grandchildren what a galjoen looked like. To my mind the larger angling population will simply have to stand together if we want to protect our fish.

The Government will have to allocate fishing quotas to those who really need it, and not to their friends as well. It would also be a good idea to publish the names of those who hold quotas.

Ebert van RooyenVishoek
Die Burger, 22 April 2000

2.4.6.1 Activity 1:

2.4.6.2 To find information in a document, determine its importance, and discuss the choices

2.4.6.3 [LO 1.2]

The public’s concern about the annihilation of the country’s fishing resources, is very obvious from the letter on p. 21.

1. Write down five of the writer’s suggestions that you regard as the most important.

2. Conduct a class discussion to motivate your choices.

The Coastal Zone

The shallow waters on the seaward side of this narrow strip include the most productive and diverse habitats in the entire marine environment: estuaries, mangroves, salt marshes, mudflats, seagrass and seaweed beds, and coral reefs. These habitats have a vital ecological function, particularly as nursery areas for commercially valuable fish species. Generally, they provide food and shelter for a huge number of species, perlemoens (abalone), oysters and mussels. In all, they account for more than two thirds of the world fisheries production. These areas also help to reduce the effects of flooding, and are often highly popular for recreation.

The landward side of the coastal zone is where most of the world’s population live. Six out of 10 people live within 60 km of coastal waters, and some two-thirds of all cities with populations of 2.5 million or more near tidal estuaries. Within the next two to three decades, the population of this coastal zone is subject to

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severe pollution, both by direct discharge and via river systems. More than three-quarters of marine pollution comes from land-based sources, with shipping, dumping, and offshore mining and oil production responsible for the rest. Problems include the uncontrolled discharge of industrial effluents, raw and treated sewage, pesticide and fertiliser residues, and silt loads from erosion, particularly into bays where the potential for dispersion and dilution is lowest. The artificial introduction of nutrients (such as nitrogen and potassium) by humans into coastal waters now equals – and will soon outstrip – that from natural sources, creating huge ecological problems.

**Strict new regulations may leave fishermen jobless**

Chris Liebenberg

**Yzerfontein** – Seasoned West coast fishermen are of the opinion that the envisaged new fishing quota regulations will have far reaching effects for fishing communities here and elsewhere along the coast who rely on the sea for their daily living.

There are fears that the towns may in the long run become economically dysfunctional when the regulations are enforced.

The new regulations stipulate inter alia that those persons who receive traditional line fish quotas, may enjoy no other fishing rights. This applies to traditional line fishing, hand line catches and tuna.

The number of licences that will be allocated, will limit the size of the crew per boat.

For local boat owners and fisherman who depend on line-fishing for their living, especially snoek, these provisions are a cause of serious concern.

It stipulates that licences will be issued to only 450 boats for the area between Cape Point and Lambert’s Bay and that the crew on some of the boats will be limited to four.

Boat owners say the limiting of boats and crew is bound to leave about 70% of the line-fishers jobless.

According to Mr. Dan Nortjé, a local resident and boat owner, he has been fishing in this area with a crew of ten for the past 37 years.

Certain members of his crew have been fishing here for over 17 years. They have families and have no other skills apart from hand line fishing.

Nortjé says should he get a licence, six members of his crew will have to be retrenched. Should he not succeed in obtaining a licence, he will have to retrench all ten of them, leaving him unemployed himself, with a boat that generates no income at all.

*Die Burger, 22 April 2000*

### 2.4.6.4 Activity 2:

**2.4.6.5 To summarise the contents of a newspaper report**

**2.4.6.6 [LO 1.2]**

Read the report and write a paragraph that would sum up the contents in about 100 words.

### 2.4.7 Assessment

<table>
<thead>
<tr>
<th>Learning Outcomes (LOs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LO 1</td>
</tr>
<tr>
<td><strong>Geographical Enquiry</strong></td>
</tr>
<tr>
<td>The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.</td>
</tr>
</tbody>
</table>

*continued on next page*
### Assessment Standards (ASs)

<table>
<thead>
<tr>
<th>LO 3</th>
<th>Exploring Issues (social and environmental)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.3</td>
<td>The learner will be able to make informed decisions about social and environmental issues and problems.</td>
</tr>
<tr>
<td></td>
<td>We know this when the learner:</td>
</tr>
<tr>
<td></td>
<td>3.3 investigates possible ways of reducing resource consumption [makes choices].</td>
</tr>
</tbody>
</table>

#### Table 2.1

<table>
<thead>
<tr>
<th>2.4.8 Memorandum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTIVITY 1</strong></td>
</tr>
<tr>
<td>• Licence-holders must be reduced.</td>
</tr>
<tr>
<td>• More stringent measures must be applied.</td>
</tr>
<tr>
<td>• Government must appoint more law-enforcement personnel.</td>
</tr>
<tr>
<td>Territorial waters must be protected.</td>
</tr>
<tr>
<td>More coastal reserves must be established.</td>
</tr>
<tr>
<td><strong>ACTIVITY 2</strong></td>
</tr>
<tr>
<td>Write your own summary report.</td>
</tr>
</tbody>
</table>

### 2.5 Commerce and industry, mining

#### 2.5.1 Social Sciences:

#### 2.5.2 GEOGRAPHY

#### 2.5.3 Grade 8

#### 2.5.4 NATURAL RESOURCES

#### 2.5.5 Module 10

#### 2.5.6 COMMERCE AND INDUSTRY, MINING

Commerce and Industry

The economy and the environment are inextricably linked. A healthy environment is not only ecologically important, but is also essential to the economic welfare of the nation. On the other hand, a healthy economy cannot be based on a damaged environment and a damaged natural resource base.

Economic development without environmental responsibility is neither acceptable nor practical. It is not a matter of chance that those companies which are leaders in their fields accept that environmental issues are inextricably linked to politics, the economy and the nation's social fabric, and accept caring for the environment as a social responsibility. They have already discovered that environmental management

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5This content is available online at <http://cnx.org/content/m31571/1.1/>. Available for free at Connexions <http://cnx.org/content/col11036/1.1/>.
is good for business; that eco-responsibility today will pay off in the form of improved dividends tomorrow. This is not just a matter of improving public relations – more resource-efficient technologies, energy efficiency, waste reduction and pollution prevention can and do increase profits substantially.

It is generally accepted than an expanding economy is needed to generate the wealth required to improve the quality of life for all South Africans, though funding for the Reconstruction and Development Programme (RDP) and other urgently required development initiatives and social upliftment programmes. But such economic development should follow a different pattern from that practised previously in both South Africa and the industrialised nations of the West, which often blighted the environment and exacted a huge social toll. The economy needs to be sustainable, operating within the finite limits of the natural resource base, and the emphasis should be not only on growth in the amount of goods and services, but equally on the growth of personal and human resources.

Figure 2.1

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
Commerce and industry in South Africa

2.5.6.1 Activity 1:

2.5.6.2 To identify the most important industries in the RSA in each of the given towns or cities, and put it in writing

2.5.6.3 [lo 1.2]

Consult the key and write down the different industries found in each city or town:

- Cape Town:
- Saldanha:
- Mossel Bay:
  - Port Elizabeth:
  - East London:
  - Durban:
- Richards Bay:
  - Kimberley:
  - Bloemfontein:
  - Sasolburg:
  - Vereeniging:
  - Witbank:
- Johannesburg:
  - Pretoria:

Mining

South Africa is extremely rich in minerals. It has the largest known deposits of gold, chromium, manganese, vanadium, andalusite and the platinum-group metals, as well as huge reserves of other valuable metals and minerals like coal, nickel, silver, antimony, asbestos, diamonds, copper, iron, zinc, lead, phosphate, uranium, titanium and zircon.

The country’s previous economic growth was largely sustained by the exploitation of these non-renewable resources, with mining contributing some 29 per cent of Gross Domestic Product in 1961.

But mining is by nature a non-sustainable activity and cannot support development in the long term.

Mining activities, on some one per cent of South Africa’s land surface, have caused huge environmental damage and pollution in many parts of the country.

This includes the discharge of polluted water back into the environment, air pollution (partly form spontaneously burning coal discard dumps, although the mining industry has done much to address the issue in recent years), waste generation, the release of ozone-depleting CFCs from huge refrigeration plants used to cool deep mines, unsightly and space-wasting dumps, and physical devastation through unrehabilitated open-cast mines.

Moreover, scarce resources, especially water and soil, has in the past been squandered by mining activities, while mining also caused serious environment related health problems amongst the workers. Mineral ore enrichment also caused considerable damage to the environment.
**Mining in South Africa**

2.5.6.4 Activity 2:

2.5.6.5 To identify different mining Activities on a map and write it down

2.5.6.6 [LO 1.2]

- Consult the map and write down the different mining activities found in every city or town.

**ENVIRONMENTAL EDUCATION**

Although environmental education has a long history, until fairly recently formal curricula in the South African education system largely ignored environmental principals and the philosophy of sustainable living. Also, there have been powerful forces effectively nullifying much of the positive benefit of environmental education: advertising and mass entertainment, which – both in this country and internationally – have

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
promoted excessive consumption, ignored the need to conserve scarce resources, and glorified wasteful living practices.

The result is that many people in South African society have become accustomed to, or take as a desirable role model, a clearly unsustainable lifestyle based on rampant consumerism and characterised by the use of disposable goods and excessive packaging.

- Many people do not understand the links between individual lifestyles, the alleviation of poverty, the use of resources, environmental degradation and, ultimately, the survival of humanity.
- They have not been taught how changing their behaviour can help others and have a positive influence on the natural environment.
- They have to be shown why an acceptable quality of life for all is dependent on the wise, sustainable use of the country’s natural resources.

**Urbanisation**

Cities generate and accumulate wealth, and are the main centres for education, new job opportunities, greater economic opportunities, health care and cultural opportunities. But they are also immense and often wasteful consumers of natural resources, requiring enormous quantities of water, energy, foodstuffs and raw materials, much of which is not used sustainably.

Without proper planning, they sprawl over and sterilise large tracts of land.

Cities generate massive amounts of pollution which contaminate water, soil and air far beyond their boundaries, while also endangering and reducing the quality of life of their own inhabitants.

The lack of effective policies for sustainable development of rural economies forces many young and economically active people to abandon these rural areas, damaging the social fabric.
Chapter 3

Term 3

3.1 Direction and bearing

3.1.1 Social Sciences
3.1.2 GEOGRAPHY
3.1.3 Grade 8
3.1.4 MAPWORK
3.1.5 Module 11
3.1.6 DIRECTION AND BEARING

1. Why should we be able to read a map?

A map is a reduction of reality as it seen perpendicularly from above and drawn to a certain scale. The scale indicates the number of times by which reality is reduced.

A good map provides information with regard to location, direction, distance, relief, routes and more. The reader can therefore read the information with ease and draw precise conclusions from it.

The series of 1:50 000 topographic maps of South Africa will be used for our studies. This is a collection of maps that cover the whole of South Africa. Each map in the series has a number to indicate its exact location and what its coordinates are. (see section 2.2.3)

A topographic map does not present phenomena of the landscape only, but also pictures the topography (relief) of the landscape by means of contour lines (see section 2.5.3).

These maps are all drawn to a scale of 1:50 000. This means that each centimetre on the map in reality represents 50 000 centimetres of the landscape. The true size is therefore reduced 50 times (see section 2.4).

To be able to read the map, you have to know and understand the symbols that are used in mapping (see section 2.5).

2. The basic elements of a map
2.1 Direction and Bearing

To be useful, a map needs to indicate the direction in which North is located. If such an indication is missing, the map must be rotated to make it readable, i.e. to have words running from left to right. This will position the northern part of the map in the position that is furthest from the reader.

1This content is available online at <http://cnx.org/content/m31578/1.1/>.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
2.1.1 Direction
The position of different places on the map in respect of one another can be determined by
The direction of the compass

3.1.6.1 ACTIVITY 1:
3.1.6.2 Complete Figure 2 by labelling the 16 main compass points.
3.1.6.3 [LO 1.1]
Always take careful note of the point FROM which and the point TO which you have to work.
Example:
2.1.2 Bearing

Bearing is a more accurate measurement that direction, because it is expressed as an ANGLE.

All bearings are taken to the right (clockwise) from NORTH by means of a protractor.

Take good note of the points FROM which and TO which you have to work to determine bearing.

The steps you have to take are:

Connect the relevant points by means of a pencilled line.

Draw the line to North through the point FROM which you have to take the measurement.

Position the protractor by placing 0º against the north line, with the centre on the point from which you have to measure.

Measure the angle from the north line to the connecting line (pencilled line of Step 1) to the right (clockwise).

Example 1:
Example 2:

What is the bearing from A to B?
3.1.6.4 ACTIVITY 2:
3.1.6.5 Study the map and calculate the direction and the bearing.
3.1.6.6 [LO 1.1]

Figure 3.5

<table>
<thead>
<tr>
<th>What is the direction?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) From A to B?</td>
</tr>
<tr>
<td>b) From C to B?</td>
</tr>
<tr>
<td>c) From C to D?</td>
</tr>
<tr>
<td>d) From D to E?</td>
</tr>
<tr>
<td>e) From E to B?</td>
</tr>
</tbody>
</table>

Table 3.2

<table>
<thead>
<tr>
<th>What is the bearing?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) From A to B?</td>
</tr>
<tr>
<td>b) From C to B?</td>
</tr>
<tr>
<td>c) From C to D?</td>
</tr>
<tr>
<td>d) From D to E?</td>
</tr>
<tr>
<td>e) From E to B?</td>
</tr>
</tbody>
</table>

Table 3.3
3.1.7 Assessment
Learning Outcomes (LOs)

LO 1
Geographical Enquiry
The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

Assessment Standards (ASs)
We know this when the learner:

- identifies and selects a variety of geographical and environmental sources that are relevant to the research;

- interprets information from maps and atlases, as well as graphic and statistical sources;

- calculates distance from maps and compares it to real distance;

- identifies physical features and features created by people and aerial photographs and maps.

Table 3.4

3.1.8 Memorandum

ACTIVITY 1:

![Figure 3.6]

ACTIVITY 2:
The Direction
a) SW
b) WSW

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
c) ENE
d) SSW
e) WNW

The bearing is

a) \(180 + 33 = \pm 213^\circ\)
b) \(180 69 = 249^\circ\)
c) \(\pm 75^\circ\)
d) \(\pm 23^\circ\)
e) \(\pm 94^\circ\)

3.2 Location

3.2.1 Social Sciences
3.2.2 GEOGRAPHY
3.2.3 Grade 8
3.2.4 MAPWORK
3.2.5 Module 12
3.2.6 LOCATION

1. Location
The location of a place can be determined by various means:

1.1 The index of the atlas
There is an alphabetical list of place names at the back of each atlas.
Let’s take Oudtshoorn as an example: Oudtshoorn RSA 8-33º 36” S, 22º 11’ E.
The number of the page on which you will find Oudtshoorn is given directly after the name Oudtshoorn.
This is followed by the latitude: 33º 36” S.
Which is followed by the longitude: 22º 11” E.
Oudtshoorn will be shown on the map at the place where these lines cross.
Example:

\[\text{Example:}\]

\[\text{This content is available online at } \langle \text{http://cnx.org/content/m31592/1.1/} \rangle.\]
Figure 3.7

REMEMBER!

The latitude is ALWAYS given FIRST. As South Africa is situated in the Southern Hemisphere, the southern longitudinal line is given first, followed by the eastern latitudinal line, as South Africa also lies in the Eastern Hemisphere.

3.2.7 ACTIVITY 1:

3.2.8 Find the location of the following places by using the index of the atlas:

3.2.9 [LO 1.2]

1. Noupooort
2. Port Elizabeth
3. Johannesburg
4. Durban
5. Stellenbosch

A map is divided into blocks of the same size. Blocks arranged horizontally, are designated numerically (in numbers), while the vertically arranged blocks are marked alphabetically. The letter and number of each block can then be used as a guide to locate a place.

Example:
The man is in block 3A.

3.2.10 ACTIVITY 2:

3.2.11 Name the blocks in which you find the following:

3.2.12 [LO 1.1]

1. a Building
2. a Horse
3. a Tree
4. a Car

1.1.1 Grid referencing / Coordinates
This is the method that is used to indicate location on 1:50 000 topographic maps.
Each topographic map sheet represents a portion of a degree (\(^\circ\)).
Each degree is divided into 60 minutes (\(^\prime\)).
Each minute, again, is divided into 60 seconds (\(^\prime\prime\)).
Example:
Figure 3.9

The location of A is 33° 31’ S; 22° 12’ E.
The location of B is 33° 33’ S; 22° 14’ E.
What will the location of C and D be?
REMEMBER!
There are 60 seconds (‘) between two minute lines, but this is not indicated on topographic maps. These 60’ have to be estimated (30’, for instance, will lie more or less in the central position between two minute lines.)
The location of C is 33° 34’ 10” S; 22° 11’ 25” E.
The location of D is 33° 33’ 30” S; 22° 15’ 50” E.
REMEMBER!
All the latitudinal lines on 1:50 000 topographic maps are Southern latitudinal lines and the higher numbers are towards the south. All the longitudinal lines are EASTERLY longitudes and their numbers increase eastwards. Latitudinal lines are always given FIRST.

3.2.13 Assessment

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Geographical Enquiry
The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

*continued on next page*
Assessment Standards (ASs)

We know this when the learner:

- identifies and selects a variety of geographical and environmental sources that are relevant to the research;

- interprets information from maps and atlases, as well as graphic and statistical sources;

- calculates distance from maps and compares it to real distance;

- identifies physical features and features created by people and aerial photographs and maps.

Table 3.5

3.2.14 Memorandum

ACTIVITY 1:

2. C4.
3. D2.
4. E5.

ACTIVITY 2:

1. 31°11’S, 24°56’E
2. 33°57’S, 25°34’E
3. 26°09’S, 28°00’E
4. 29°50’S, 31°01’E
5. 33°56’S, 18°52’E

ACTIVITY 2:

2. C4.
3. D2.
4. E5.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
3.3 Designation\(^3\)

3.3.1 Social Sciences
3.3.2 GEOGRAPHY
3.3.3 Grade 8
3.3.4 MAPWORK
3.3.5 Module 13

3.3.6 DESIGNATION OF TOPOGRAPHIC MAPS

Topographic maps of the RSA are drawn according to degree square. Each degree square is indicated by means of a number that consists of four figures. These figures are assembled from the values of the latitudinal and longitudinal degrees shown at the northwesterly corner of the map.

---

\(^3\)This content is available online at [http://cnx.org/content/m31601/1.1/].

Available for free at Connexions [http://cnx.org/content/col11036/1.1]
The shaded square is the map sheet with which we are working at present. What information does it provide?

22° 28’ represents the following:

- 22° = 22º latitudinal line (South)
- 28° = 28º longitudinal line (East)

C = square divided into four squares that represent 30’ of a degree and are always named in the sequence AB.

CD

B = the larger square C is also divided into four squares, each representing 15’ of a degree. The sequence in which they are named also is AB.

CD

Each squared degree is therefore spread out over sixteen 1:50 000 topographic map sheets.

**ACTIVITY 1:**

[LO 1.2]

1. Indicate the location of the following 1:50 000 map sheets by making use of a representation.
   - 28° 22’ DA
   - 35° 28’ BC

2. Which map sheet lies immediately to the North of 28° 22’ DA?

3. Which map sheet lies immediately to the East of 35° 28’ BC?

4. Which map sheet west of 28° 22’ DA?

5. Which map sheet lies South of 35° 28’ BC?

### 3.3.7 Assessment

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- interprets information from maps and atlases, as well as graphic and statistical sources;
• calculates distance from maps and
  compares it to real distance;

• identifies physical features and features
  created by people and aerial photographs and maps.

Table 3.6

3.3.8 Memorandum

ACTIVITY:

1. 2822 BC.
2. 3528 BD.
3. 2822 CB.
4. 3528 DA.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
3.4 Scale and distance calculations

3.4.1 Social Sciences

3.4.2 GEOGRAPHY

3.4.3 Grade 8

3.4.4 MAPWORK

3.4.5 Module 14

3.4.6 SCALE AND CALCULATING DISTANCE

1. Scale and calculating distance
   1.1 Scale
   Scale refers to how much smaller the map is than the actual earth area of the earth surface that is represented. You have already learnt about the different kinds of scale that are used:
   a) The word scale expresses the scale in words, e.g. “One centimetre represents half a kilometre.”
   b) The ratio scale is written as a ratio or a fraction, e.g. 1:50 000 or \( \frac{1}{50000} \)
   This means that one unit (e.g. cm) on the map represents 50 000 of the same unit (cm) of the earth surface.
   c) The linear scale is a line marked off in centimetres to indicate a corresponding distance on the earth in kilometres.

   ![Figure 3.12](image)

   Distance shown as 3,5 km

   1.1.1 Measuring distance on a map
   We will be making use of the topographic map series drawn to the scale of 1:50 000 throughout.
   Work in the following manner to determine distance:
   Use a ruler to measure the distance on the map accurately in centimetres.
   Convert the distance to km or m, depending on what is required.
   Example:
   A_____________________________B
   Scale 1:50 000
   The map distance between A and B is 10 cm.
   What is the actual distance in km?
   10 cm \( \times \) 50 000
   500 000 cm \( \div \) 100 000
   = 5 km
   What is the actual distance in m?

   4This content is available online at <http://cnx.org/content/m29749/1.1/>.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
10 cm × 50 000
500 000 cm ÷ 100
= 5 000 m

Why do we divide by 100 000 and by 100?
The metric units of measurement can be represented as follows:

<table>
<thead>
<tr>
<th>Km</th>
<th>Hm</th>
<th>Dm</th>
<th>M</th>
<th>dm</th>
<th>cm</th>
<th>mm</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
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<td>0</td>
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Table 3.7

We therefore have 100 000 cm in 1 km 100 cm in 1 metre

You may use a shorter method, if you can remember that the scale of 1:50 000 is the same as:

Now calculate the distance as follows:
10 cm × 0,5
= 5 km
10 cm × 500
= 500 m

If a meandering road has to be measured, the route should first be measured by laying a piece of string along its representation. Then measure the length of the string against a ruler and then use the method suggested above, or the linear scale.

ACTIVITY:
1. Calculate the actual distance in metres if the distance on the 1:50 000 topographic map is as follows:
   a) 2,3 cm
   b) 6,8 cm
   c) 5,5 cm
2. Calculate the actual distance in kilometres if the distance on the 1:50 000 topographic map is as follows:
   a) 90,4 cm
   b) 56,3 cm
   c) 103,6 cm
3. Study the 1:50 000 topographical map of Beaufort West and answer the following questions:
   a) What is the distance (as the crow flies) in km from Grootplaat (32°16′15″S; 22°34′36″E) to Lammertjiesleegte (spot height 881) (32°19′50″S; 22°32′50″E)?
   b) How far will you travel (on the N1) in your car from the Motel (32°20′00″S; 22°35′00″E) to the train bridge (32°21′48″S; 22°33′43″E).

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
c) What is the distance in metres of the Springfontein dam wall? (33°20'39"S; 22°35'08"E) [LO 1.3]

3.4.7 Assessment

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Table 3.8

3.4.8 Memorandum

ACTIVITY:

1.1. 1150 m.

1.2. 3400 m.

1.3. 2750 m.

1.1 45.2 km.

1.2 28.25 km.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
1.1 51.8 km.
2.1 4 cm x .5 = 2 km.

1.2 ± 10.8 X .5 = 5.4 km.

1.3 ± .4 cm X 500 = 200 m.
3.5 Conventional signs used on 1:50 000 maps

3.5.1 Social Sciences
3.5.2 GEOGRAPHY
3.5.3 Grade 8
3.5.4 MAPWORK
3.5.5 Module 15
3.5.6 CONVENTIONAL SIGNS USED ON 1:50000 MAPS

Figure 3.14
Available for free at Connexions <http://cnx.org/content/col11036/1.1>
Conventional signs used on 1:50 000 maps

These signs form part of the “language” of topographic maps. They are provided in the key / reference below the map and are used the world over. You should get to know and understand them thoroughly.

Map symbols for cultural phenomena (phenomena created by people)

The signs used on maps are selected to be immediately recognisable for what they represent. Cultural phenomena that are shown are buildings, towns, power lines (in black) dams, canals (in blue) trees, plantations and fields (in green). These symbols are exaggerated on the map, because they would be too small to be represented if their actual sizes were represented.

Map symbols for natural phenomena

The most important natural phenomena are mountains, hills, valleys and plains. These phenomena, however, have to be deduced from contour lines and are not represented by specific symbols. We’ll be studying contour lines shortly.

Another important natural phenomenon shown on topographic maps is the drainage of any particular area. This is observed by examining the rivers and their tributaries, which are indicated in blue on a topographic map.

On topographic maps, perennial rivers are indicated by means of continuous blue lines, while the (seasonal) rivers of areas with low or seasonal rains are indicated with dotted lines.

The direction of the flow of a river also provides important information about the higher and lower parts of an area:

Water ALWAYS flows from high to lower places.
Tributaries flow into the main stream in the direction of the flow.

Example:

![Figure 3.15](http://example.com/figure3.15.png)

Observe the way in which dam walls are constructed across a river bed. The dam wall is always downstream.

Example:

![Figure 3.16](http://example.com/figure3.16.png)

Height prediction on a topographical map

Height can be indicated on a map in several ways.

The **trigonometric beacon** is shown by means of a triangle with the beacon’s number to the right of the triangle, as well as its exact height above sea level, in metres, below the triangle. On a map, these beacons are usually shown to be on the highest parts.

Example:
SPOT HEIGHTS on a map are shown by means of black dots and the height value is printed alongside it.

Example
The vertical difference in height between two high points is obtained by subtracting the lower measurement from the higher one, e.g.: A = 800 m; B = 200 m; Difference in height = 600 m.

Contour lines are unbroken brown lines marked in number values.

Contour lines connect all places that have the same height above sea level. The figure printed on the line indicates the actual height in metres.

The difference in height between two consecutive contour lines is known as the contour interval or vertical interval and is always 20 m. Each 100 m is indicated with a thicker contour line.

The further apart the contour lines are, the more level (flat) the landscape.

The closer to one another the contour lines are, the steeper and more mountainous the landscape.

Where there are perpendicular cliffs, contour lines touch. Remember, however, that contour lines never cross one another.

By examining the contours, you will be able to determine the direction in which a river is flowing and to identify certain forms of the landscape.

ACTIVITY 1:
[LO 1.4]
1. Explain what is represented by the following map symbols:
   a)

   ![Figure 3.18]

   Figure 3.18

   b)

   ![Figure 3.19]

   Figure 3.19

   c)
2. Carefully study the area between the N1 and the R81 (SE corner of the map). Name at least six map symbols that occur in this area.
3. Are there any indications that the railway is electrified?
4. What type of communication lines join Beaufort West with the outside world?
5. What map symbols will you find at the following coordinates?
   a) 32º17'06"S ; 22º37'15"E
   b) 32º19'11"S ; 22º34'04"E
   c) 32º20'49"S ; 22º34'09"E
   d) 32º19'26"S ; 22º37'28"E
6. What is the average height above sea level in the vicinity of the rifle range (32º19'06"S ; 22º35'37"E)?
7. What is the height of the highest trig. beacon on the topographic map?
8. What is the contour interval on this map?
9. Determine the vertical difference in length between Lammertjiesleegte (32º20'52"S; 22º33'37"E) and trig. beacon 148.
10. Is there any relation between the route of the railway and the relief of the area?
11. What is the name of the perennial river in this area?
12. In which direction does this river in no. 11 flow?
13. Do you think there is a flood danger in this area? Explain.
14. What indications are there on this map that stock farming occurs in this area?
15. What do you think is the purpose of the furrows indicated on the map?
16. What can you derive from the rainfall in this area?
3.5.7 Assessment
Learning Outcomes (LOs)

LO 1
Geographical Enquiry
The learner will be able to use enquiry skills to investigate geographical and environmental concepts and processes.

Assessment Standards (ASs)

We know this when the learner:

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Table 3.9

3.5.8

3.5.8.1 Memorandum

ACTIVITY:

1. (a) Graves.

(a) Excavations.
(b) Provincial border.
(c) Power lines.
(d) Trigonometrical beacon

1. Faint roads, rivers, buildings, railway lines, power lines, dams, windmill, forested area, cultivated lands, trigonometrical beacons, spot height, rows of trees.
2. None.
3. Roads, railway line.

1. (a) Railway line.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
(b)1. Faint footpaths.

(c)1. Cultivated lands.

Built-up area. (Mgquba).

- ±550 - 600 m.
- ρ 318 (32°45'50"S, 26°52'0"E) is 653,6 m high.
- 20 metres.
- Hillcrest = 540 m.

ρ 84 = 624.2
624.2 - 540 = 84.2 metres.

- In general the railway lines follow the contour lines more than roads do.
- Tyume.
- Comes from the north and leaves the map in the south-west.
- Yes, when it rains a lot the areas where the 2 main streams converge, can be flooded.
- Irrigation dams and cultivated lands close to rivers.
- Trees and bushes.
- Moderate to reasonably high rainfall.

3.6 Reading contour patterns on a topographic map

3.6.1 Social Sciences
3.6.2 GEOGRAPHY
3.6.3 Grade 8
3.6.4 MAPWORK
3.6.5 Module 16
3.6.6 Reading contour patterns on a topographic map

a) A STEEP SLOPE AND A GRADUAL SLOPE

In the case of a gradual slope, the contour lines are far apart.

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6This content is available online at <http://cnx.org/content/m29760/1.1/>.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
In the case of a steep slope, the contour lines are closer to one another.

b) A CONVEX AND CONCAVE SLOPE

![Image of a convex and concave slope](image)

**Figure 3.24**

c) A FLAT-TOPPED MOUNTAIN (MESA)
A large, flat, table-like top is distinguishable.

![Image of a flat-topped mountain](image)

**Figure 3.25**

d) A FLAT-TOPPED HILL (BUTTE) AND POINTED HILLS

![Image of a flat-topped hill and pointed hills](image)

**Figure 3.26**

Pointed hill

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
Flat-topped hill

In the case of pointed hills, the contours are nearly circular and at equal distances from one another. The contours with the highest height values are in the middle.

In the case of a flat-topped hill, the inner two or three contours will be close together. The innermost contour has the highest value, but encloses a larger, oval area (the table).

e) A CLIFF OR WATERFALL

Where two or three contour lines lie together, a perpendicular cliff is indicated. This occurs in mountainous regions.

When a river is precipitated over such a cliff, a waterfall is created.

f) MOUNTAIN RANGES

The highest contour values in mountain ranges are also in the middle of the pattern of contours, but high peaks will have separate points. Rivers could occur here.

g) A POORT AND NECK

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
Poort

When a river runs through a narrow opening in a mountain range, such an opening is referred to as a poort. The cliffs/precipices are very steep, so contours are close together on the map.

A neck occurs where a lower point that is still much higher than the surrounding area occurs between two hills.

h) A RIVER VALLEY AND A SPUR

A spur is formed between two river valleys.

In the case of a river valley, the greatest height is to the outer side and the land sinks down towards the inner side, where the riverbed is.

In the case of a spur, the greatest height is to the inner side and the land sinks down towards the outer side of the spur.

All of the above landforms will not occur on all topographic maps, but many of them will occur on such maps. Practising to read topographic maps will enable the map-reader to recognise these features easily.

ACTIVITY:

[LO 1.4]
1. Build a model to represent contours.

   Figure 3.33

   a) Copy the various contours by means of tracing paper.
   b) Collect cardboard boxes and cut each of the shapes formed by the individual contours from the cardboard.
   c) Start by cutting out the shape formed by the lowest contour (400 m) and repeat the cutting out for each of the contours.
   d) Arrange the cardboard sheets representing contour areas as in the figure and paste them together.

   a) You could finish this model by applying Plaster of Paris to create a relief model showing different landforms.

3.6.7 Assessment

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  and maps.

Table 3.10

3.6.8 Memorandum

ACTIVITY:

1. Different topographical sketch-maps can be given to different groups. Different contour models are
   then built and evaluated per group.

3.7 Topographic maps and photographs

3.7.1 Social Sciences

3.7.2 GEOGRAPHY

3.7.3 Grade 8

3.7.4 MAPWORK

3.7.5 Module 17

3.7.6 Topographic maps and photographs

The big difference between a photograph and a map is that a map represents a vertical “plan” of a region,
while a photograph presents a realistic image.

The ordinary photographs with which we are acquainted are taken with a camera that is held in the
horizontal position.

\footnote{This content is available online at <http://cnx.org/content/m31931/1.1/>}
Objects that are close to the camera look large and those that are further away seem smaller. Objects in the foreground also obscure information regarding what is behind them. This hidden area is known as the hidden ground. What happens behind the double-storey building is unknown to us.

These photographs cannot be used for information when we draw maps. A special kind of aerial photograph is used for the drawing of maps. Such photographs are taken vertically, i.e., by means of a camera that is attached to a special aeroplane in such a way that it points down towards the earth.

Study a vertical aerial photograph of Pietermaritzburg. The 1:50 000 map and the aerial photograph show the same area. You will therefore be able to identify the objects that are the same on the photograph and the map.
A technical college will be found on the map at 29°35′30″S; 30°23′43″E. On the aerial photo the position of the technical college is marked S.

By comparing the features of the card with those of the aerial photograph, may other characteristics will be recognisable.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
3.7.6.1 **ACTIVITY:**

Use a topographic map and aerial photo of Pietermaritzburg and answer the following questions by circling the letter of the correct answer.

1. The point F on the aerial photo is the
   a) national road  
   b) dirt road  
   c) railway

3.7.7 **Assessment**

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**Table 3.11**

3.7.8 **Memorandum**

**ACTIVITY:**

1.1(a) Higher than the surrounding area.

1.2(c) East.

1.3(b) Permanent.

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
1.4(b) Dam.

1.5(c) River.

1.6(a) Hospital.

1.7(c) Sports grounds.

2. If the residential area of Willowtown were to develop, it will develop to the
   a) south
   b) east
   c) west
3. The most important freeway on this map is the
   a) N6
   b) N3
   c) N2
4. The phenomenon marked E on the aerial photo is
   a) water tower
   b) athletic field
   c) cricket field
5. The object marked with a 2 is a
   a) hiking trail
   b) bridge
   c) river
6. The object marked with a C is a
   a) factory
   b) police station
   c) residential home
7. The object marked with a I is a
   a) water tower
   b) golf course
   c) silo

Available for free at Connexions <http://cnx.org/content/col11036/1.1>
Attributes

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Connexions’s modular, interactive courses are in use worldwide by universities, community colleges, K-12 schools, distance learners, and lifelong learners. Connexions materials are in many languages, including English, Spanish, Chinese, Japanese, Italian, Vietnamese, French, Portuguese, and Thai. Connexions is part of an exciting new information distribution system that allows for Print on Demand Books. Connexions has partnered with innovative on-demand publisher QOOP to accelerate the delivery of printed course materials and textbooks into classrooms worldwide at lower prices than traditional academic publishers.