

NCEA SKILLS BOOKLET

LEVEL 1

Maps section

You will use this map section to answer questions in Chapters 4 and 12. Lift the section from the staples and keep it in the pocket you have made at the front of this book.

Key for map of Warwick (M3)

Built-up area; National route marker.....	
Major business area; Recreation area.....	
Road, sealed surface, two or more lanes; Cutting.....	
Road, sealed surface, one lane; Embankment.....	
Road, unsealed surface, two lanes; Bridge.....	
Road, unsealed surface, one lane; Causeway.....	
Vehicle track; Culvert.....	
Foot track; Foot bridge.....	
Underpass; Overpass.....	
Gate; Cattle grid.....	
Railway; Station; Siding.....	
Bridge, railway; Tunnel, railway.....	
Power transmission line, major; minor.....	
Telephone line.....	
Fence; Levee or bank.....	
Mine; Windmill.....	
Yard; Building or shed; Church.....	
Post Office; School; Hospital.....	
Police Station; Fire Station; Ambulance.....	
Control station.....	
Forest, dense; medium; scattered.....	
Scrub, dense; medium; scattered.....	
Tropical rain forest; Pine plantation.....	
Orchard or vineyard, plantation; Wind break.....	
Spot elevation; Contour with value; Cliff.....	
Depression contour; Sand dunes; Sand ridges.....	
Mangrove; Wharf; Pier; Breakwaters.....	
Sand; Rock, bare or awash.....	
Intertidal flat; Wreck, exposed.....	
Coastline approximate; Ledge; Reef.....	
Lake, perennial; Stream, perennial.....	
Lake, intermittent; Stream, indeterminate.....	
Lake, mainly dry; Stream, mainly dry.....	
Swamp; Land subject to inundation.....	
Tank; Small dam; Bore or well; Spring.....	
Disappearing underground; Waterholes.....	
Cadastral line, surveyed; unsurveyed.....	
Boundary, State; Shire.....	
Boundary, County; Parish.....	
Name, County; Parish; Portion number.....	

Key for maps M2 and M4

ROADS	
Four lanes or more.....	
Two lanes.....	
Narrow road.....	
Vehicle track.....	
Foot track.....	
Poled route.....	
Training track.....	
Road Surface	<div> sealed..... metalled..... unmetalled..... </div>
State Highway.....	
Tunnel.....	
Bridge, two lane.....	
Bridge, one lane.....	
Gate, gate (locked).....	
Footbridge.....	
Cableway.....	
Industrial cableway.....	

VEGETATION FEATURES

Native forest.....	
Exotic coniferous forest.....	
Exotic non-coniferous forest.....	
Scrub.....	
Scattered scrub.....	
Shelter belt.....	
Trees.....	
Orchard.....	
Mangroves.....	

RELIEF FEATURES

Index contour.....	
Intermediate contours.....	
Perennial snow and ice contours.....	
Supplementary contour.....	
Depression contours.....	
Shallow depressions.....	
Trig stations; beacons, unbeacons.....	
Elevation in metres.....	
Cliff, terrace.....	
Rock outcrops.....	
Stopbank.....	
Cutting.....	
Embankment.....	
Sandhills.....	
Saddle.....	
Cave.....	
Alpine features	
Moraine.....	
Moraine wall.....	
Scree.....	

RAILWAYS

Double or multiple track.....	
Single track.....	
Station.....	
Railway yard.....	
Level crossing.....	
Road over railway.....	
Railway over road.....	
Tramway.....	

WATER FEATURES

Coastal rocks.....	
Sand and mud.....	
Sand.....	
Shingle.....	
Swamp.....	
Boat ramp.....	
Breakwater.....	
Slipway.....	
Wharf, jetty.....	
Dam, waterfall.....	
Cold spring, hot spring.....	
Floodgate.....	
Watercourse, drain.....	
Stream disappearing into ground.....	

MISCELLANEOUS

Residential area.....	
Large buildings.....	
Building.....	
Homestead.....	
Church.....	
Cemetery.....	
Dredge tailings.....	
Historic sites:	
Monument.....	
Plaque or signpost.....	
Maori Pa, redoubt.....	
Reservoir, tank.....	
Helipad.....	
Wind machine (pump, generator, fan).....	
Lighthouse, beacon.....	
Wreck.....	
Fence (selection only).....	
Disused water race.....	
Power line on pylons (actual positions).....	
Power line on poles (away from roads).....	
Telephone line (away from roads).....	
Masts; radio, T.V., microwave.....	
Mines; underground, opencast.....	
Buried gas pipeline.....	

WHAKATANE



EXERCISE 2 From your brainstorm you can see that Geographers study many different things. In the space below write down what you consider Geography is.

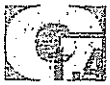
My definition of Geography is:

As you get higher up in the subject you can specialise in one of these areas of Geography. These branches of Geography have names. Many of them end in the word "ology" which means "a study of".

EXERCISE 3 Match the following branches of Geography.

- | | |
|-----------------|-----------------------|
| 1 BIOGEOGRAPHY | A Soils |
| 2 CLIMATOLOGY | B Maps |
| 3 GEOMORPHOLOGY | C Water |
| 4 PEDOLOGY | D People |
| 5 HYDROLOGY | E Human behaviour |
| 6 DEMOGRAPHY | F Shape of the land |
| 7 CARTOGRAPHY | G Caves |
| 8 PALAEOLOGY | H Rocks |
| 9 OCEANOGRAPHY | I Societies |
| 10 GEOLOGY | J Origin of humankind |
| 11 ANTHROPOLOGY | K Plants and animals |
| 12 SOCIOLOGY | L Seas |
| 13 PSYCHOLOGY | M Fossils |
| 14 SPELEOLOGY | N Weather and climate |

- | | | |
|---------|----------|----------|
| 1 _____ | 6 _____ | 11 _____ |
| 2 _____ | 7 _____ | 12 _____ |
| 3 _____ | 8 _____ | 13 _____ |
| 4 _____ | 9 _____ | 14 _____ |
| 5 _____ | 10 _____ | |



2 Natural and cultural features

Geographers study such a large number of different features that they like to simplify the situation by categorising them. One of the simplest methods of doing this is to divide features into two main categories.

NATURAL FEATURES Features that occur naturally on the earth's surface. They would still be there without people.

CULTURAL FEATURES These are features that are only present because of people. They are to do with people or are made by them.

EXERCISE 4 Go back to the star diagram you did in Exercise 1. Choose 2 different colours, one for natural branches of Geography and the other for cultural. Do a key underneath your diagram and colour code the key items.

EXERCISE 5 The photo below is an aerial photograph of a typical secondary school. Look carefully at this photo and on the next page, write 5 natural and 5 cultural features you can see.

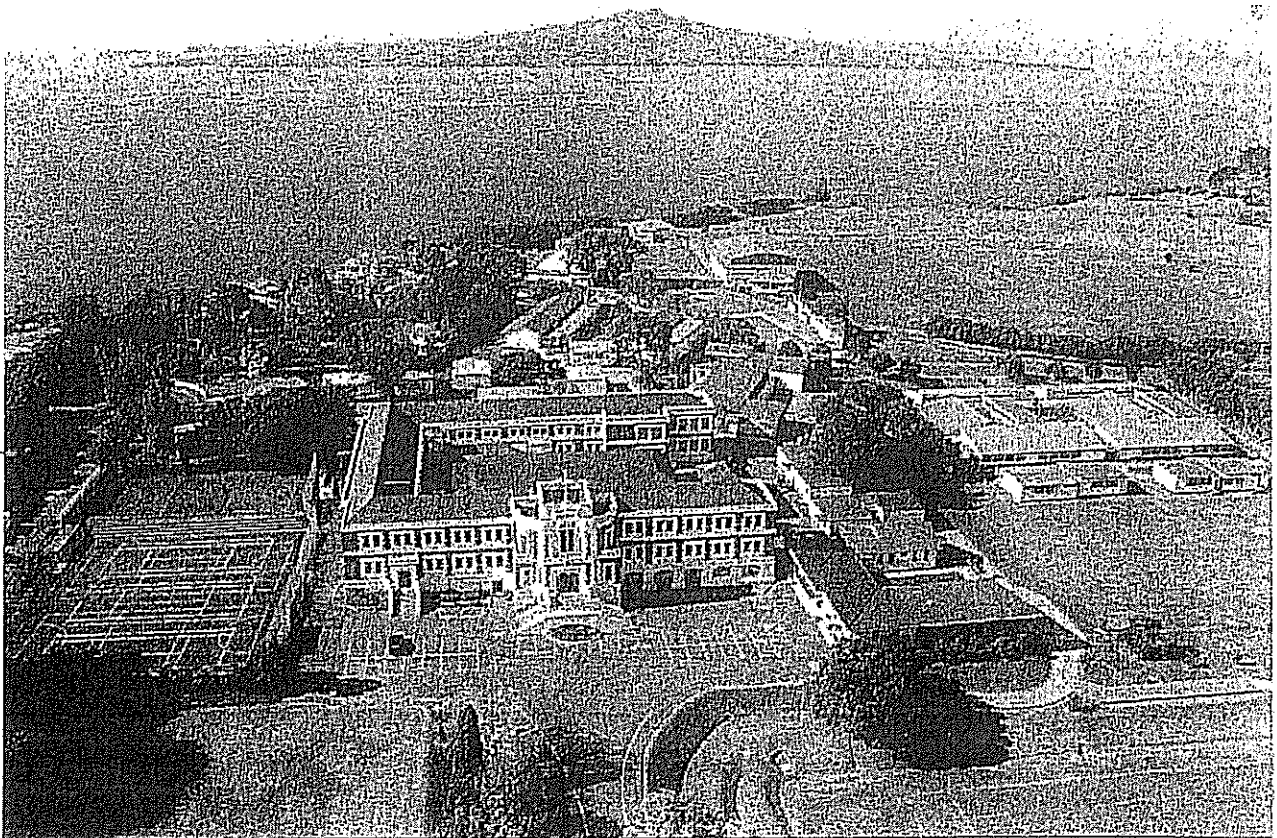


Photo: Courtesy Takapuna Grammar School

Natural features

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Cultural features

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

EXERCISE 6 State whether the following are natural or cultural features:

River _____

Canal _____

Dam _____

Coral reef _____

Factory _____

Exotic forest _____

Volcano _____

Orchard _____

Swamp _____

Valley _____

Town _____

Beach _____

Native forest _____

Garden centre _____

Sewage pond _____

Reclaimed land _____



3 Maps and mapping rules

Everyone knows that Geographers use maps regularly. Why is this?

Maps are models of reality. Like all models they are scaled-down versions of the real thing in much the same way as a toy car is a scaled-down version of a real car. Maps are printed in a size that makes them easy to handle.

A book of maps is called an atlas. If you look in an atlas you will see that there are many different types of maps. Again, Geographers love to categorise these and again you can use the divisions of **natural maps**, **cultural maps** or those that show both sets of features.

Natural Maps The most common of these are relief maps that show the shape of the land. These are concerned with features such as mountains, hills, rivers and lakes. Other less visible features of the natural environment are also represented such as rainfall or geology.

Cultural Maps These represent human features such as roads, buildings, airports and canals. Maps showing political boundaries or economic factors are also cultural.

General Maps General maps combine both natural and cultural features. These are the most useful maps for everyday use. The amount of detail will depend on the scale of the map. Atlas maps show only the major features of the environment.

Larger scale general maps are called **topographic maps**. These are usually printed on large sheets and show many details. Examples of these are included in the centre of this book. You will be learning how to use these in the next section.



In need of a relief map

Mapping rules

All of these maps have several things in common. For example they are all bird's eye views of part of the earth's surface and are drawn to scale. There are 6 things that every map needs. In order to remember this you need to think of the word **FACKTS**.

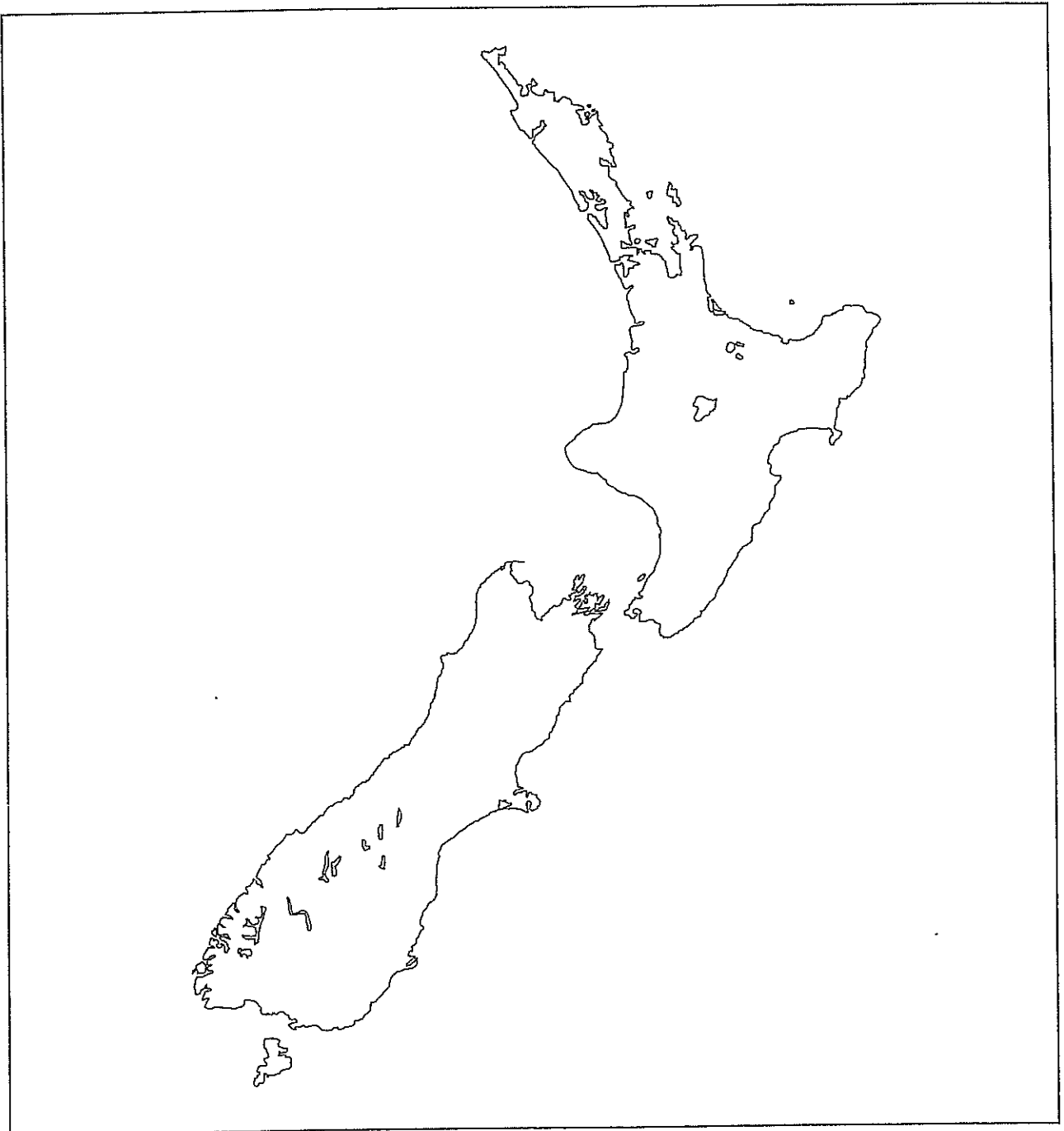
This stands for the following:

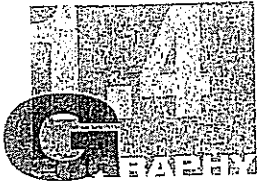
F rame
A row
C olour
K ey
T itle
S cale

FRAME	This shows the limits or borders of your map.		
ARROW	This shows which way North is		
COLOUR	Use appropriate colours on your map. These include:		
	Blue – water features	Yellow – deserts or beaches	Red – cities
	Brown – highland	Green – plains or vegetation	Black – roads
KEY	Learn appropriate symbols used (see Exercise 1, Chapter 3)		
TITLE	Make this specific to what you are showing e.g. Map of (<i>place name</i>) showing (<i>relevant features</i>)		
SCALE	Use a linear scale or a ratio (see Section 4, Chapter 3)		

EXERCISE 7 Complete the map of New Zealand below to show the listed features. All features need to show a specific location by the use of a dot, symbol or appropriate shading. Include your FACTS.

Tasman Sea	Bay of Plenty	Mt. Cook	Dunedin	Fiordland
Cook Strait	Hawkes Bay	Auckland	Hamilton	Lake Taupo
Foveaux Strait	Mt. Taranaki	Christchurch	Waikato River	Canterbury Plains
Pacific Ocean	Mt. Ruapehu	Wellington	Clutha River	Banks Peninsula





Chapter 2: Important Geographic Ideas and Māori terms



1 Important Geographic Ideas

Much of your Level One course is based on your understanding of 11 Important Geographic Ideas (often referred to as IGIs). These are outlined below.

EXERCISE 1 Match the different IGIs to their meanings. Write a – k in the appropriate boxes.

- | | |
|--|---|
| <input type="checkbox"/> 1 LOCATION | a The arrangement of features in space |
| <input type="checkbox"/> 2 DISTANCE | b To make different |
| <input type="checkbox"/> 3 ACCESSIBILITY | c Where something is found |
| <input type="checkbox"/> 4 CULTURE | d A way of viewing and thinking about one's environment |
| <input type="checkbox"/> 5 PERCEPTION | e A sequence of related actions |
| <input type="checkbox"/> 6 PATTERNS | f A two way action |
| <input type="checkbox"/> 7 PROCESSES | g An area with several common features |
| <input type="checkbox"/> 8 REGION | h How easy it is to get to a place |
| <input type="checkbox"/> 9 INTERACTION | i How far away something is |
| <input type="checkbox"/> 10 SYSTEMS | j A common way of life shared by a group of people. |
| <input type="checkbox"/> 11 CHANGE | k A set of features linked together to form a whole. |

EXERCISE 2 Each of the following sentences describes an IGI. Next to it write down which IGI this is.

- 1 The Greenhouse effect could cause an increase in NZ's temperatures. _____
- 2 Waves at a beach erode back the cliffs that they pound. _____
- 3 Trees need soil to help them grow. The soil relies on dead leaves to put nutrients back into it.

- 4 Australia lies 2000 km from Auckland. _____
- 5 In India a bride's family has to pay a dowry to her husband's family. _____
- 6 Whangarei lies North of Auckland and East of Dargaville. _____
- 7 The only route through the Southern Alps is Arthur's Pass. _____
- 8 Most of New Zealand's population is peripheral as most people live near the sea. _____
- 9 New Zealanders think of Indians as being very poor. _____
- 10 Making steel requires limestone, coal and iron ore. This is put in a furnace where processes combine it to produce steel. _____
- 11 The Southern Alps are wet and cold so few people live there. Those who do, make a living from either agriculture or tourism. _____

EXERCISE 3

For each IGI write your own definition using geographic concepts you have studied this year. Draw a symbol/picture to help you remember what each one means.

IGI	My definition	Symbol
1 LOCATION		
2 DISTANCE		
3 ACCESSIBILITY		
4 SYSTEMS		
5 INTERACTION		
6 CHANGE		
7 PROCESSES		
8 PATTERNS		
9 REGIONS		
10 CULTURE		
11 PERCEPTION		



2 Māori terms

During your Level 1 course you will need to be familiar with several Māori terms. The most common of these are given below.

Aroha	Koha	Korero purakau	Taonga
Mana	Kaitiakitanga	Tapu	Iwi

EXERCISE 4 Match the terms above to the descriptions in the table.

TERM	DESCRIPTION
	A resource either physical or cultural that can be found in the environment.
	A tribe with geographical boundaries.
	Caring for the environment in a sustainable way.
	A gift to acknowledge what someone has done.
	A legend or story that explains an event or activity.
	Māori love and feelings for the environment.
	Sacred or special.
	Respect paid to a person.

EXERCISE 5 Complete these sentences using the correct Māori term from the list above.

- 1 Māori show _____ to volcanic cones such as Ruapehu.
- 2 In Rotorua the local _____ are the Te Arawa.
- 3 The geothermal hot pools and geysers in Rotorua are considered _____.
- 4 Because of this it is important that _____ is shown to them so they can be preserved for future generations.
- 5 The presence of volcanism on Ruapehu is explained through the _____ of the great chief Ngatoro-i-rangi.



Chapter 3: Topographic map skills 1

In this section of work you will learn about basic topographic map skills that will be examined as part of your NCEA external exam at the end of the year. In this chapter you will learn skills to interpret and use the following important map features:

- | | |
|---------------|--------------------|
| 1 Map Symbols | 4 Scale |
| 2 Direction | 5 Grid References |
| 3 Distance | 6 Calculating Area |



1 Map symbols

EXERCISE 1 Use the topographic map key in the centre of this book to draw the symbols used for each of the following features:



Native forest



Exotic coniferous forest



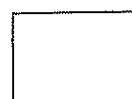
Footbridge



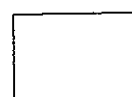
Cliff



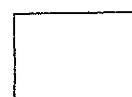
Sand/Mud



Trig station (beaconed)



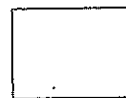
Church



Major road (State Highway)



Swamp



Foot track



Māori pa



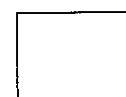
Power line on poles



Lighthouse



Railway line (single track)



Station



Contours



2 Direction

Direction markers help us to locate features on a topographic map. The main way of determining direction is by the use of compass points. This is the most common way of showing direction on a map, as it is quick and simple to use. NEVER talk about the 'top' or 'bottom' of a map. Use the terms North or South. NEVER talk about the 'left' or 'right' of a map. Use the terms West or East.

Compass points

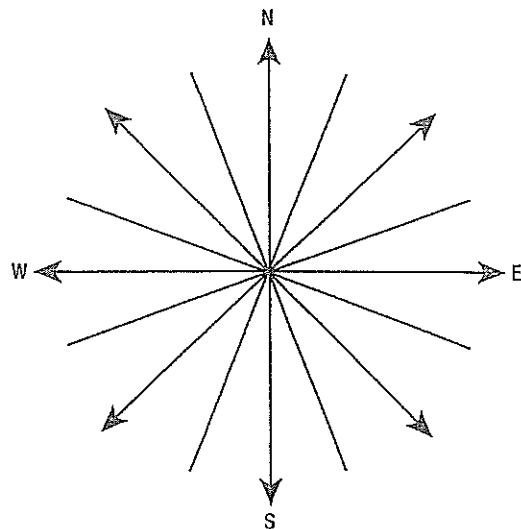
There are four main points of the compass called the **cardinal points**. Between these, are the next four or **inter-cardinal points**. Together these make up the 8-point compass that you must be able to use with accuracy.

These can be broken down even further to form the 16-point compass. The rule here is to find the nearest cardinal point first, followed by the nearest inter-cardinal point.

The general rule is that most topographical maps have north pointing straight up.

EXERCISE 2 Fill in the missing compass points on the compass rose.

NW	NNW
NNE	SSE
SSW	WNW
ESE	SE
WSW	ENE
NE	SW



Calculating direction

Direction is always a FROM and TO statement. When you read a question you need to carefully work out which point you need to start at e.g.

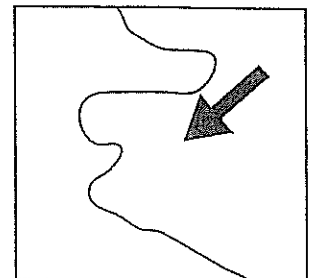
X Does it ask for the direction of X to Y or Y to X?

Y

Special cases

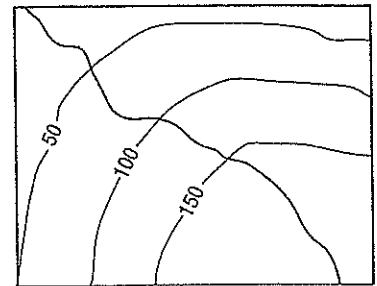
Wind Wind is always stated as the direction it is blowing from.

The wind in the diagram is blowing from a ____ direction.



Rivers Rivers always flow from high to low land. Therefore you often need to work out the height of the land first.

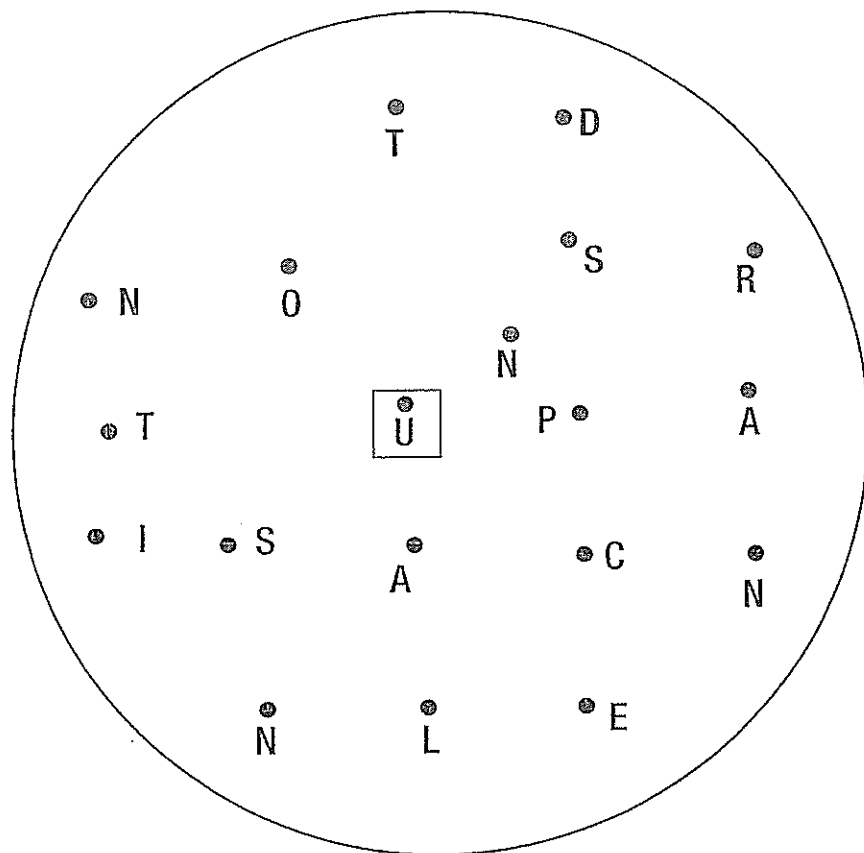
The river in this diagram is flowing towards the _____.



EXERCISE 3 Solve the riddle below. Start at the 'U' in the middle. Take each subsequent measurement from the last letter found.

How Do You Make Gold Soup? U _ _ _ _ _

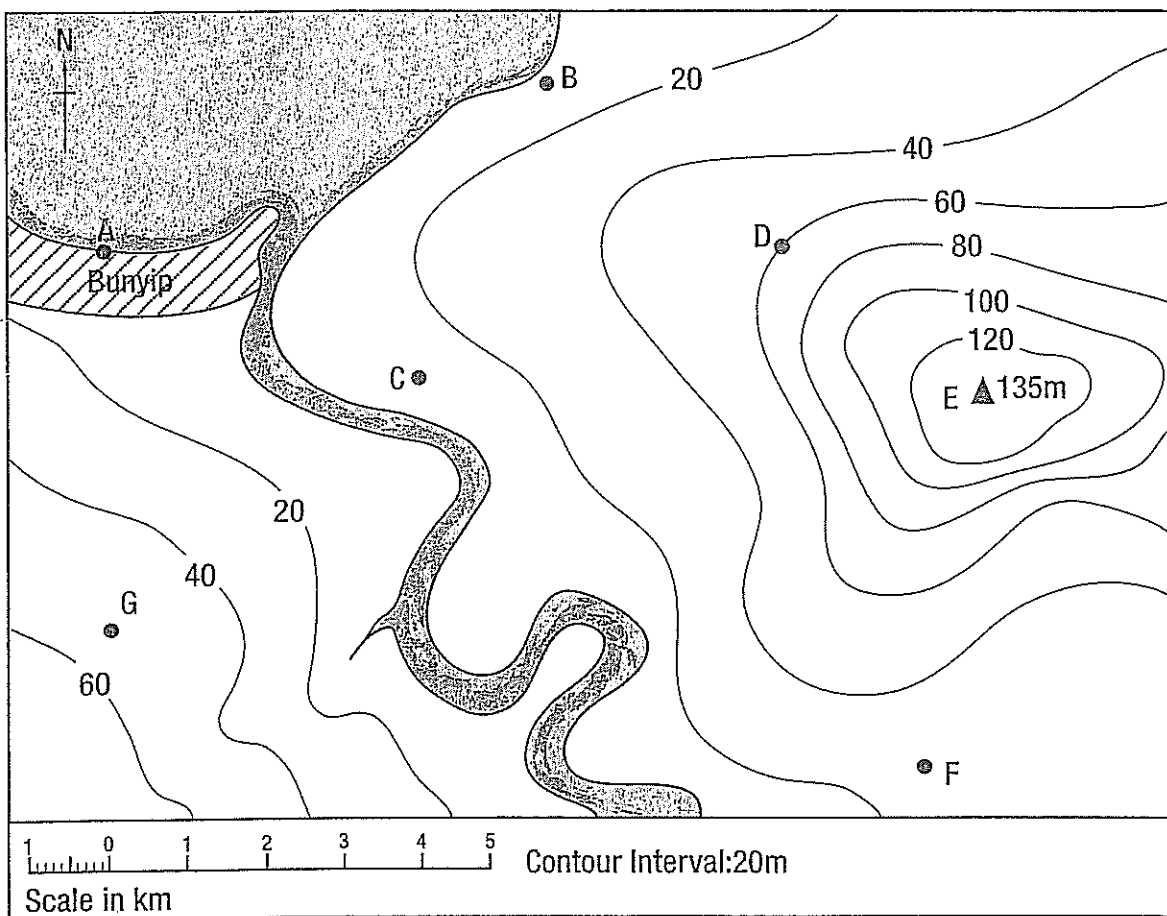
- 1 3 cm NE
- 2 6 cm S
- 3 4 cm W
- 4 3 cm NW
- 5 3 cm N
- 6 8 cm SE
- 7 2 cm N
- 8 3 cm NE
- 9 2 cm N
- 10 6 cm W
- 11 3 cm SW
- 12 2 cm SE



EXERCISE 4 Using the Bunyip Bay Area map below give the compass directions involved if:

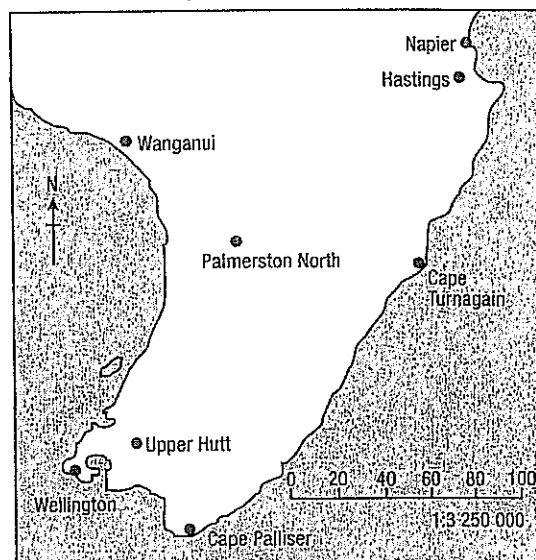
- a You stood at A and looked towards G _____
- b You stood at A and looked towards D _____
- c You stood at E and looked towards C _____
- d You stood at E and looked towards B _____
- e You stood at C and looked towards F _____
- f You stood at C and looked towards B _____
- g You stood at F and looked towards A _____
- h You stood at F and looked towards G _____

BUNYIP BAY AREA



EXERCISE 5 Using the map to the right, work out the distance from:

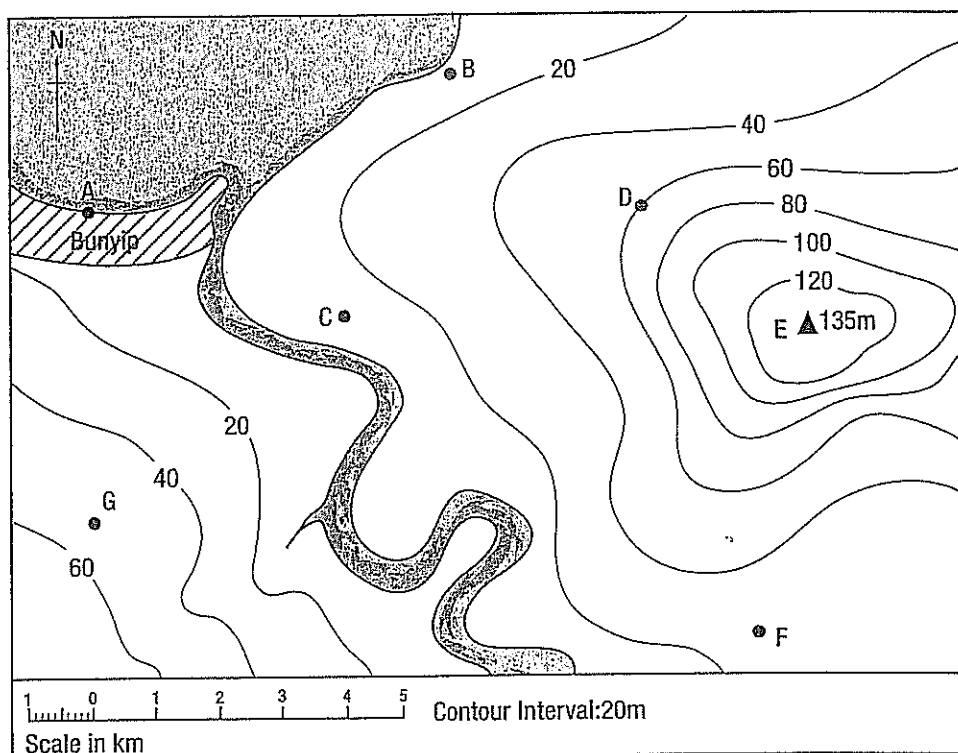
- 1 Wellington to Wanganui _____ km
- 2 Upper Hutt to Palmerston North _____ km
- 3 Wanganui to Hastings _____ km
- 4 Wellington to Napier _____ km
- 5 Cape Palliser to Cape Turnagain along the coast _____ km



EXERCISE 6 Using the Bunyip Bay map below, calculate the following distances:

- a One end of the northern border to the southern border of the map (not including the scale) _____
- b Town A to Town G _____
- c Town A to town B _____
- d Town A to the top of the hill at E _____
- e The length of the river shown _____

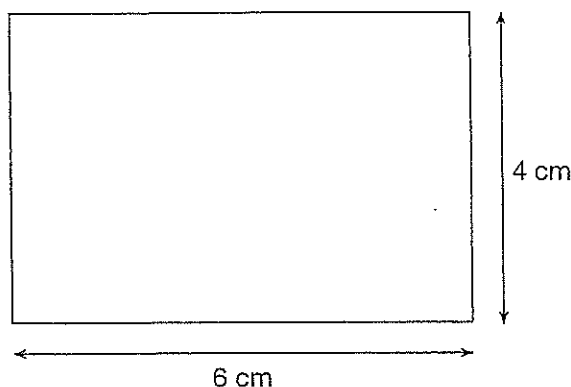
BUNYIP BAY AREA





4 Scale

If I wanted to draw a picture of the classroom that measures 6 m x 4 m it would be too big to draw at the correct size. We would therefore draw it to scale as follows:



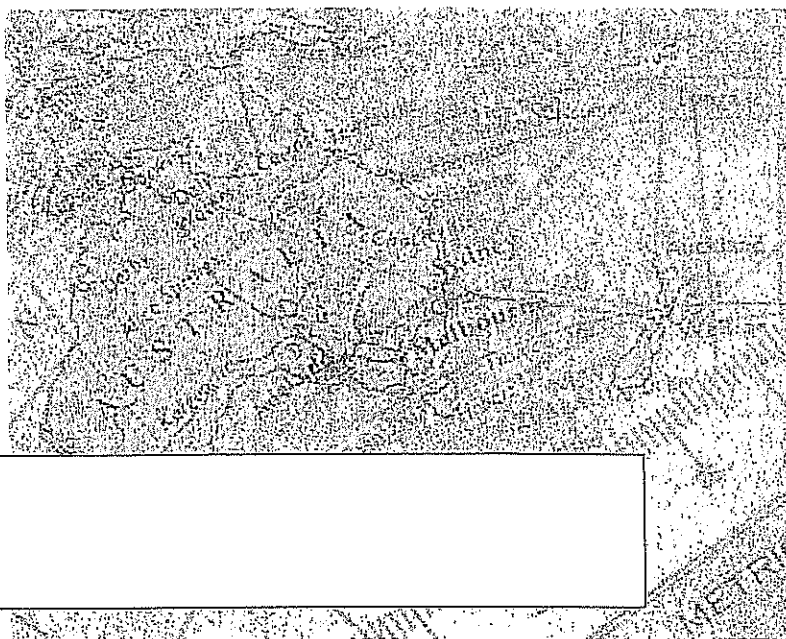
We can write the scale in several ways:

- 1 As a statement 1 cm = 1 m
- 2 As a line or linear scale
- 3 As a ratio 1 : 100

It is the last of these that students have the most trouble with. In order to find out more about ratios do the following exercise.

EXERCISE 7 Using an atlas write down the ratios used to show the following:

- A A map of the North Island _____
- B A map of NZ _____
- C A map of the Pacific _____
- D A map of the world _____
- E A map of Auckland city _____
- F A map of Australia _____



What happens to the area of land covered as the ratio increases?

Another way of looking at a ratio is that it tells you how many times an area of land has been reduced to fit onto a page.

Maps that have been reduced only a few times have a large scale. If we were to reduce the size of this page by half, it would then have a ratio of 1:2. This would mean that we could see a lot of detail.

Maps that have been reduced several times have a small scale. If we wanted to fit the world on a page we would have to reduce it by heaps – say 100 million times. This would give a ratio of 1:100 000 000. At this scale we could not see much detail.

EXERCISE 8 Put the maps A to F in Exercise 7 in order of scale from the smallest to the largest.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____

Working out ratio numbers

This is not as difficult as it looks. All that has happened is that both parts of the same equation are converted to the same units. All the maps you will be dealing with are in centimetres. The general rule is that a ratio scale always starts with a '1':

For example, if you had to show as a ratio, a scale in which

1 cm represents 1 metre

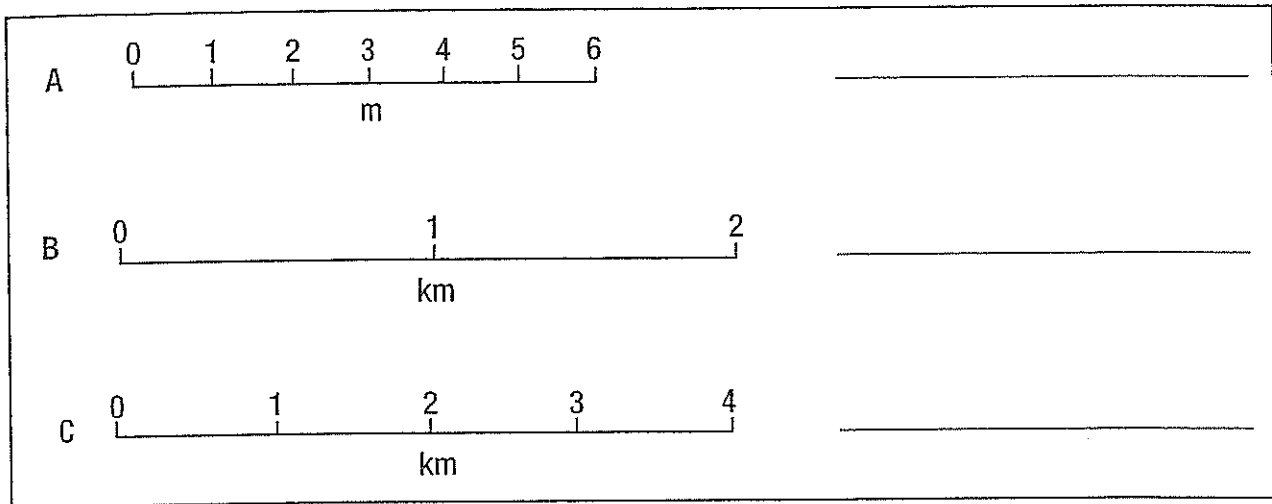
you would know that there are 100 centimetres in a metre, so the ratio would be written as:

1:100

EXERCISE 9 Work out the correct ratio where:

- 1 1 cm represents 100 m _____
- 2 1 cm represents 600 km _____
- 3 0.5 cm represents 1 km _____
- 4 0.5 cm represents 1 m _____
- 5 1 cm represents 1 km _____
- 6 2 cm represents 500 m _____

EXERCISE 10 You can also use the same principle by measuring a given linear scale and working out the correct ratio to go with it. Try the following:



EXERCISE 11 Using your knowledge of scale, match the two columns together.

- 1 Map of the British Isles
- 2 Map of a Sydney suburb
- 3 Map of Asia
- 4 Map of Australia
- 5 Map of the World
- 6 Map of Wellington Urban Area

- A 1: 137 000 000
- B 1: 50 000
- C 1: 200 000
- D 1: 4 500 000
- E 1: 50 000 000
- F 1: 13 500 000

- 1 _____
- 2 _____
- 3 _____

- 4 _____
- 5 _____
- 6 _____



5 Grid references

In order to describe the exact location of any feature on a map, grid lines are used. These are vertical and horizontal lines drawn on a map that are numbered in sequence.

Grid lines are also known as **eastings** and **northings**.

The vertical lines on a map tell you how far east you are so are called **eastings**.

The horizontal lines on a map tell you how far north you are so are known as **northings**.

Using grid lines to find locations

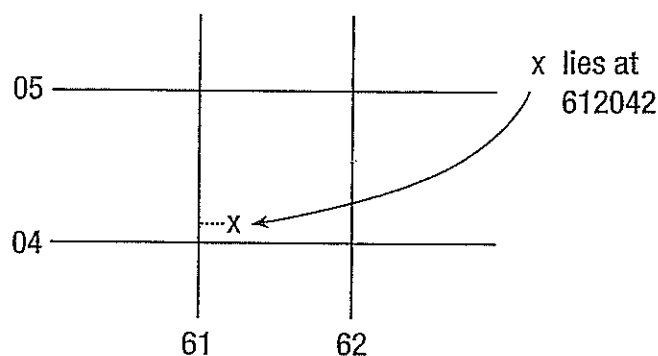
It is possible to describe the location by using either four- or six-figure grid references. Four-figure references give the general area while six-figure references are used to find a more exact location.

Always read the numbers on the bottom first and then the numbers up the side. The easiest way to remember this is that you learn to **crawl** before you **climb**.

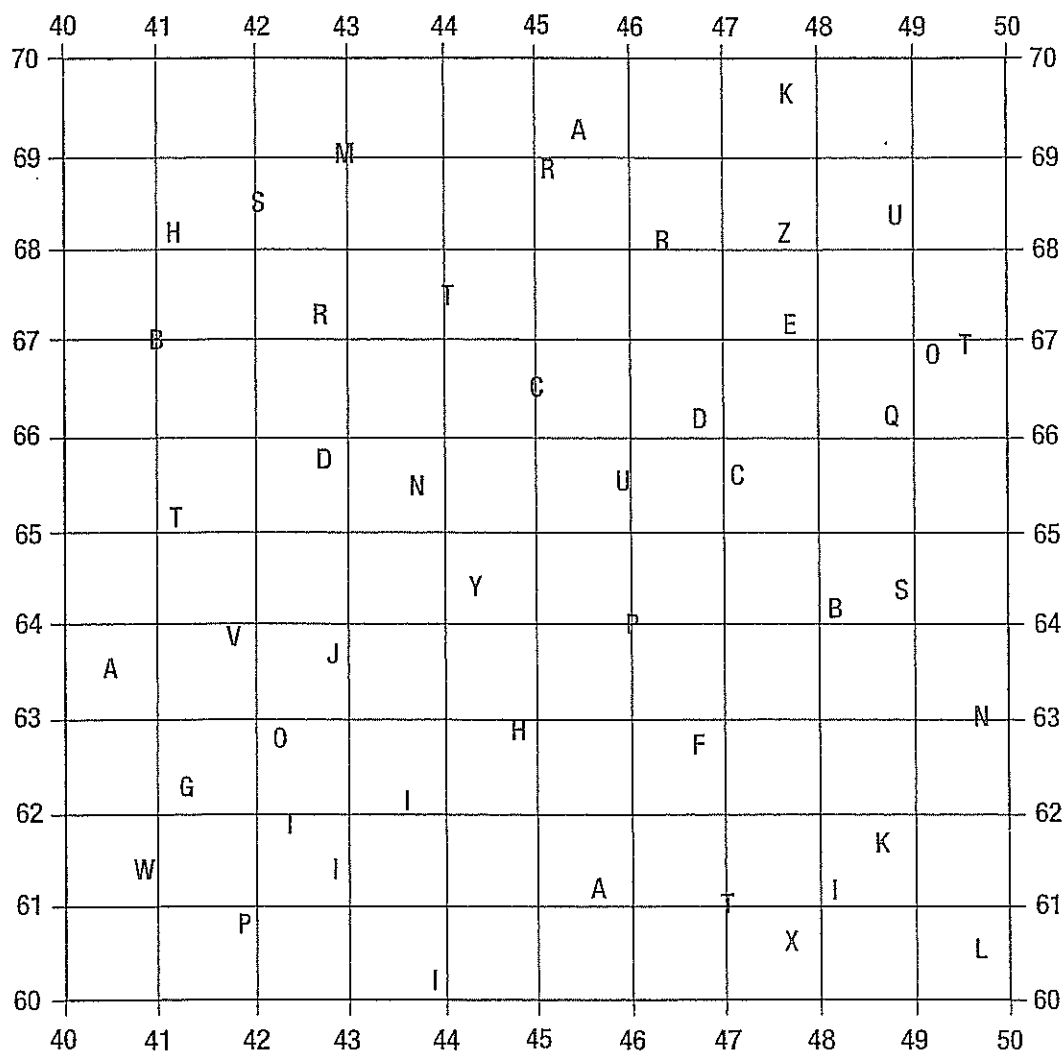
The procedure therefore is as follows:

- 1 Look for the nearest grid line to the left of the feature you wish to locate along the bottom (the easting).
- 2 Imagine that the space between that grid line and the next (between which your feature lies) is divided into 10 imaginary pieces – like 1 cm on a ruler which is divided into 10 mm. Estimate this distance or, if possible, use a ruler to measure it accurately.
- 3 Repeat this procedure for the nearest whole grid line to the bottom of the feature along the side scale (the northing).
- 4 Estimate the distance between the two grid lines or measure with a ruler.

This is shown below:



EXERCISE 12 Solve the riddle below by finding the letters at the following grid references:



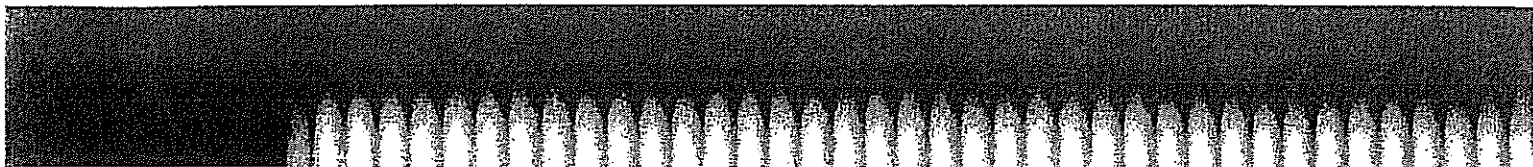
a Why wouldn't the skeleton jump off the cliff?

- | | | |
|----|--------|-------|
| 1 | 436622 | _____ |
| 2 | 440675 | _____ |
| 3 | 448628 | _____ |
| 4 | 405635 | _____ |
| 5 | 467663 | _____ |
| 6 | 497630 | _____ |
| 7 | 492669 | _____ |
| 8 | 413623 | _____ |
| 9 | 489684 | _____ |
| 10 | 412651 | _____ |
| 11 | 489644 | _____ |

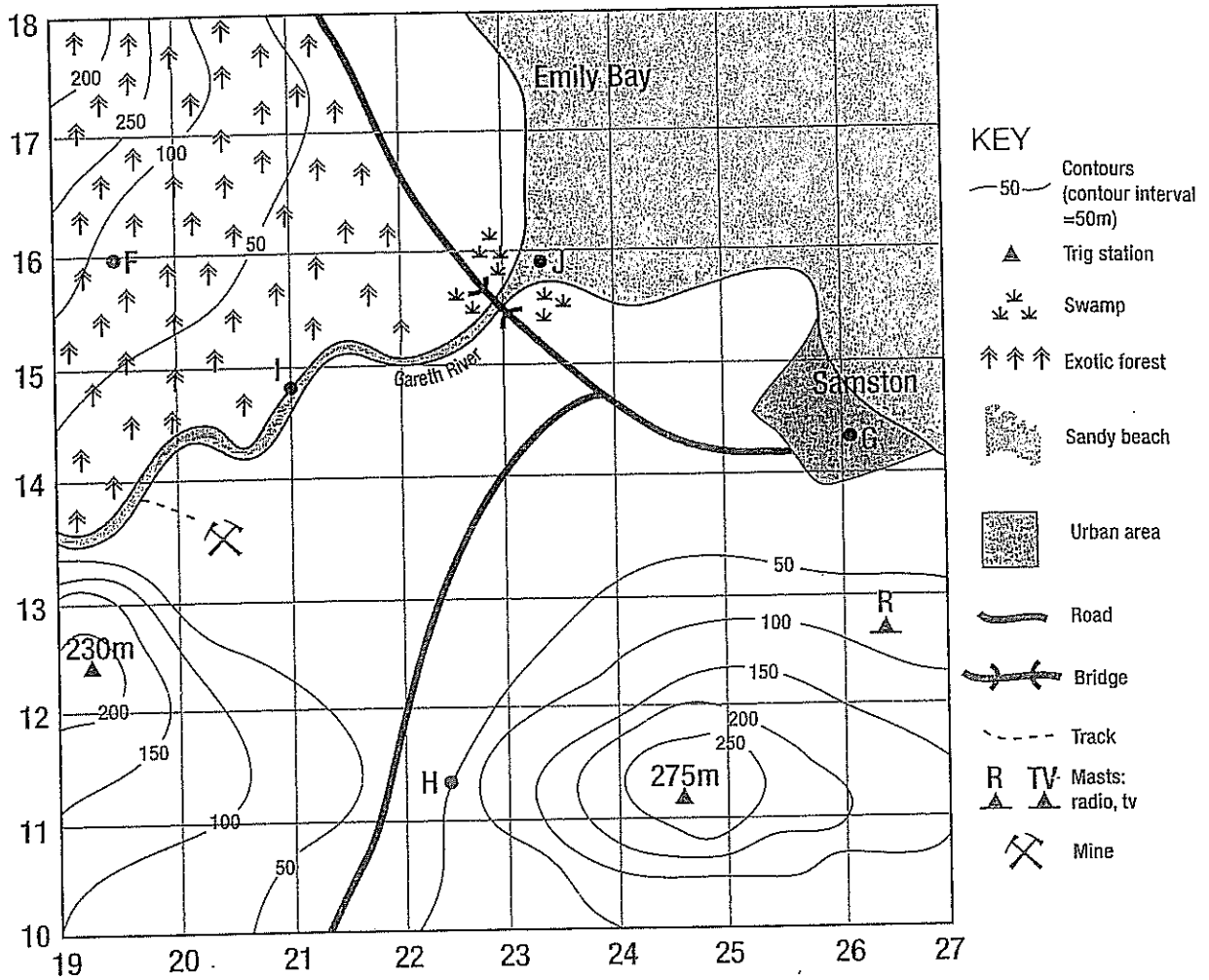
b What is big, has four wheels and flies?

- | | | |
|----|--------|-------|
| 1 | 463681 | _____ |
| 2 | 460655 | _____ |
| 3 | 481641 | _____ |
| 4 | 410670 | _____ |
| 5 | 481611 | _____ |
| 6 | 420685 | _____ |
| 7 | 412682 | _____ |
| 8 | 495670 | _____ |
| 9 | 452689 | _____ |
| 10 | 489684 | _____ |
| 11 | 471656 | _____ |
| 12 | 477697 | _____ |

c Using this grid, make up your own sentence for your neighbour to solve.



EXERCISE 13 Using the map below, try the following exercises.



1 Name the features found at the following grid references.

- a 230160 _____
- b 264127 _____
- c 204135 _____
- d 230156 _____
- e 234175 _____

2 Give the grid references for the following locations:

- a F _____
- b G _____
- c H _____
- d I _____
- e J _____



6 Relationships and patterns

One skill often asked in exams is to recognise the relationship between different features on a map. This requires you to look at the bigger picture involved, rather than small details. What you need to do here, is to think about how each feature changes and then see if they are related. This is a skill that will develop as you get more practice.

EXERCISE 14 Complete the following sentences to show the relationship between the features on a map by circling the correct answer.

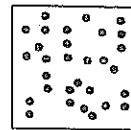
- A In areas of high or steep relief there tend to be *more/less* roads.
- B Settlements tend to occur in areas where there is *steep/flat* relief.
- C Port development occurs in areas where the water channel is *shallow/deep*.
- D Native forests are more common in areas where the relief is *steep/flat*.
- E Geothermal sites are often very popular sites for *tourists/farming*.

EXERCISE 15 What is the relationship between relief and transport shown in the map opposite?

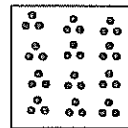
Patterns

In each of the following situations the distribution forms a different pattern. There are five main distribution patterns.

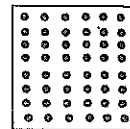
- 1 This pattern shows people sunbathing on a beach. There is no obvious pattern formed, so we call this a **random** pattern.



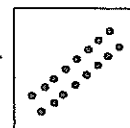
- 2 This pattern shows groups of friends talking in a party. This is called a **clustered** pattern.



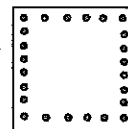
- 3 This pattern shows students sitting an exam in a hall. The pattern is very ordered so is called a **regular or grid** pattern.



- 4 This pattern shows people queuing up outside the tuck shop to buy their lunch. Because this pattern forms a line, we call it a **linear** pattern.



- 5 This pattern shows a crowd watching a rugby match. They are all seated around the outside of the ground. This is called a **peripheral** pattern.



EXERCISE 16 What type of pattern could be seen on a map where;

- a all the people tend to live close to the coastline of an island _____
- b all the buildings in a settlement occur along the main road _____
- c the population of a region occurs in small pockets where land is fertile _____
- d the trees in an orchard are all planted in neat rows? _____

