

# 1.5

# Learning about the UK using OS maps

## In this unit you will learn about:

- Ordnance Survey (OS) maps.

## Key Skills

- Use and interpret OS maps
- Use and interpret aerial photos
- Label maps

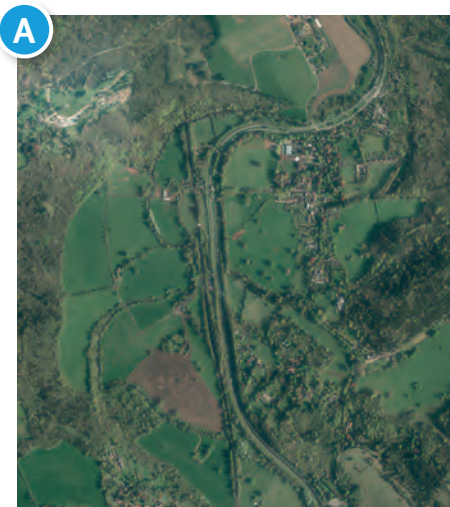
## Maps and photos

Look at photo **A** and map **B**. The map shows the same area as the photo. Locate the River Mole on the photo and the map. Now locate and follow the route of the A24.

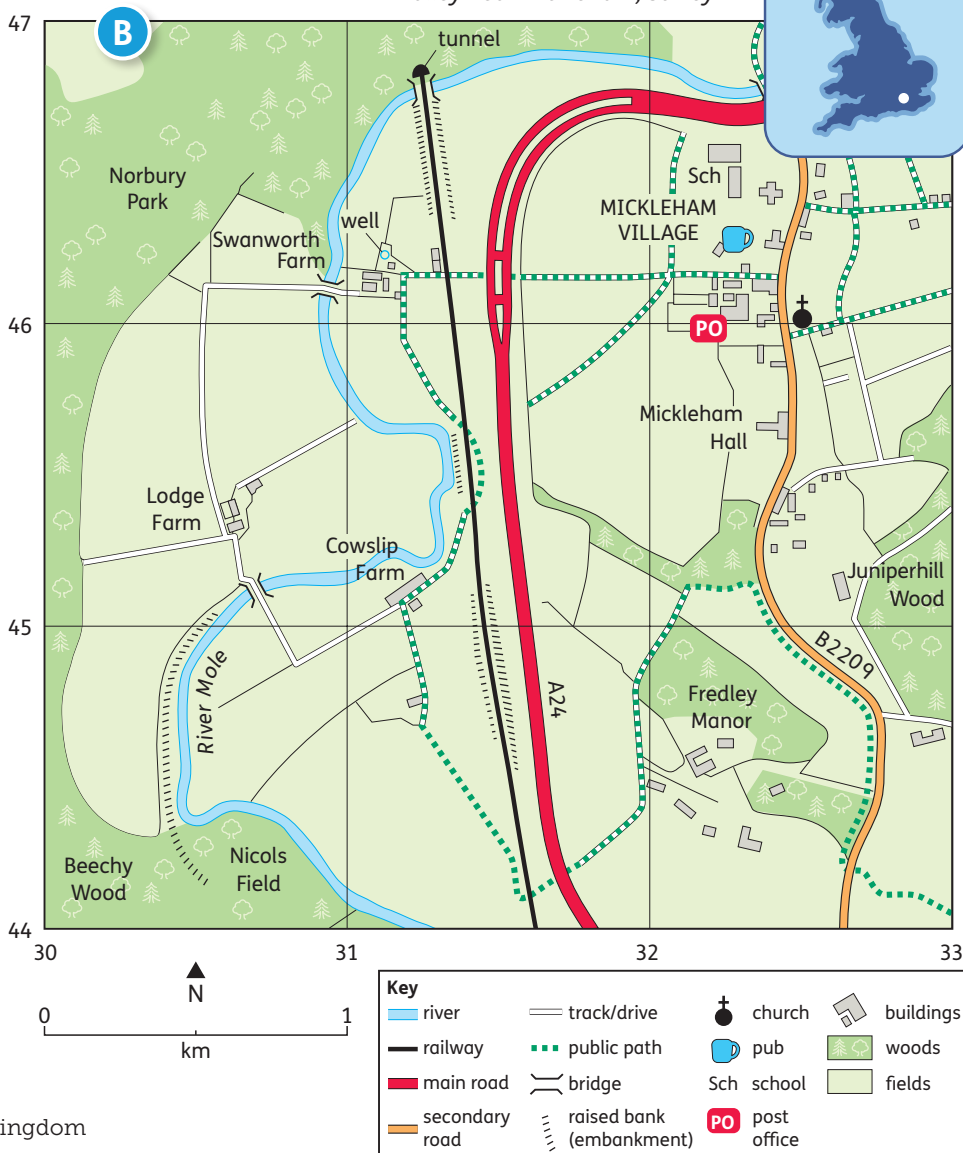
Notice that the map uses symbols to show features such as roads and schools. These are explained in the key. Like all good maps it also has a title, a scale and a north arrow.

## Key Terms

**Ordnance Survey (OS) maps** – very detailed maps of Great Britain available at different scales



Aerial photo of the River Mole valley near Mickleham, Surrey



## Did you know...

### What are OS maps?

**Ordnance Survey maps** (or OS maps) are extremely detailed maps. They use symbols and have grid lines to help you locate places. You will use OS maps a great deal as you study geography.

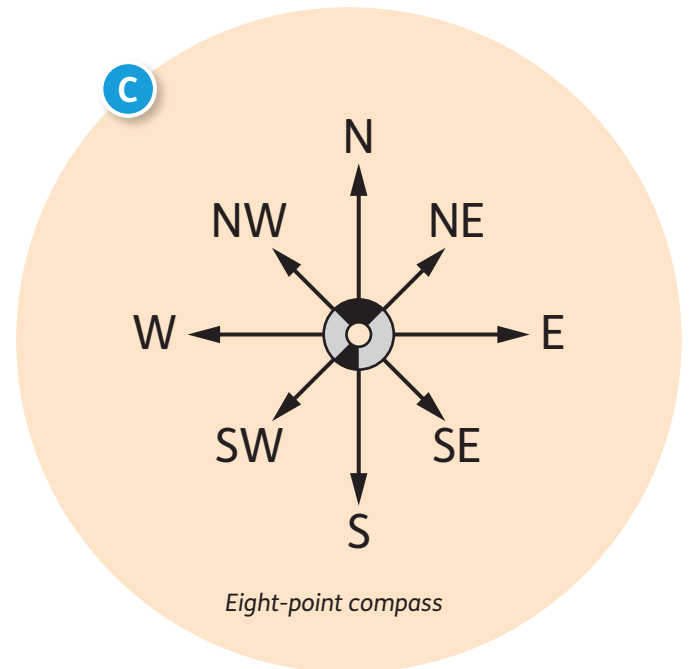
## A sense of direction

Locate the north arrow in the top left-hand corner of map **B**. Most commonly, the north arrow on a map points straight up. But be careful! Always check the north arrow to make sure.

Diagram **C** shows the eight points of a compass. They allow you to be quite precise when giving directions.

Using the compass with map **B** shows you that:

- The railway runs roughly north–south. So does the A24.
- The church in Mickleham Village is east of the post office.
- The pub in Mickleham Village is south of the school.



### Activities

*The 'How to...' section (pages 281–282) outlines OS map skills, including giving compass directions, measuring distance and using grid references. See also page 304 for a guide to OS map symbols.*

- 1 Study map **B**.
  - (a) Draw the symbol for a bridge over the river.
  - (b) **Identify** the farm located nearest the well.
  - (c) **State** the number of the secondary road.
  - (d) There is a pub in Mickleham. **Identify** the other three buildings that serve the local community. Draw the symbol for each one.

- 2 Chip the seagull took a trip across the area in map **B**. Circle or underline the correct directions.

From Lodge Farm Chip flew *south-east* / *south-west* to Cowslip Farm. He walked (slowly) along the public path to Swanworth Farm which is *north* / *east* of Cowslip Farm. He continued *east* / *north-east* flying above the public path towards Mickleham Village.

- 3 Make up your own short story about Chip the seagull, using the map and giving directions.



#### Tip!

Use the eight point compass (diagram **C**) to help you.

## Measuring distance

Look again at map **B**. Notice that a line has been drawn under the map to show distance. This is called a **linear scale**.

*For more guidance on linear scale, see 'How to...' on page 282.*

Use your ruler to measure 1km on the scale. This is the straight line distance. You can use your ruler and the scale to see that Cowslip Farm is about 1km from Swanworth Farm.

## Finding places using grid references

Map **B** has gridlines and each one has a number. The numbers increase from left to right and from bottom to top. The gridlines can be used to identify a grid square or pinpoint a place.

*You can learn about grid references in 'How to...' on page 281.*

### Four-figure grid references

Look at map section **D**. This is the top right-hand grid square from map **B** and shows part of Mickleham Village. You can identify this specific grid square by giving it a four-figure grid reference.

Grid references always give the number along the bottom first, followed by the number up the side.

#### Tip!

Use the saying 'along the corridor and up the stairs' to help you remember the correct order of the numbers in grid references.

Now look at grid **E**. The highlighted square shows the position of map segment **D**. Notice that the highlighted square is the *next square beyond* grid line 32 and the *next square above* grid line 46.

The four-figure grid reference for this square is therefore 3246.

### Six-figure grid references

To pinpoint a place within a grid square, six-figure grid references are used.

- Divide the distance between each grid line into tenths (you will usually guess at – rather than measure – 'tenths' in-between grid lines).
- Add the 'tenths' number to the number of the gridline to give three numbers reading across and another three numbers reading up.

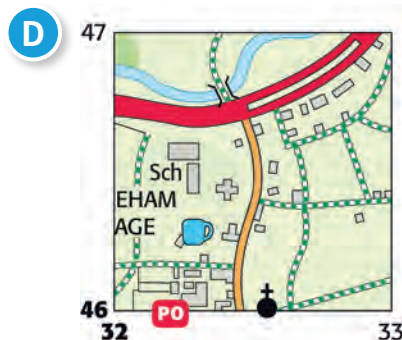
So, on grid **F**, the school in grid square 3246 is located at:

32 and 3/10 along and 46 and 5/10 up.

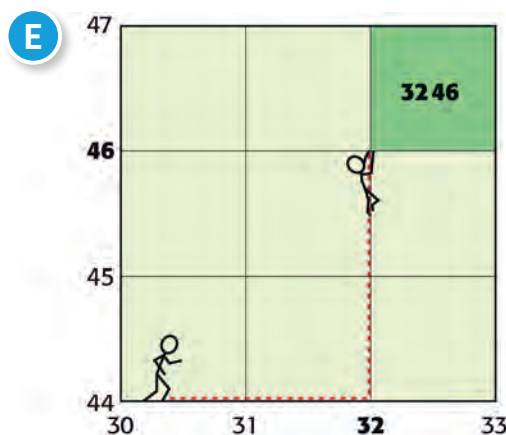
This is written 3 2 3 4 6 5.

#### Key Terms

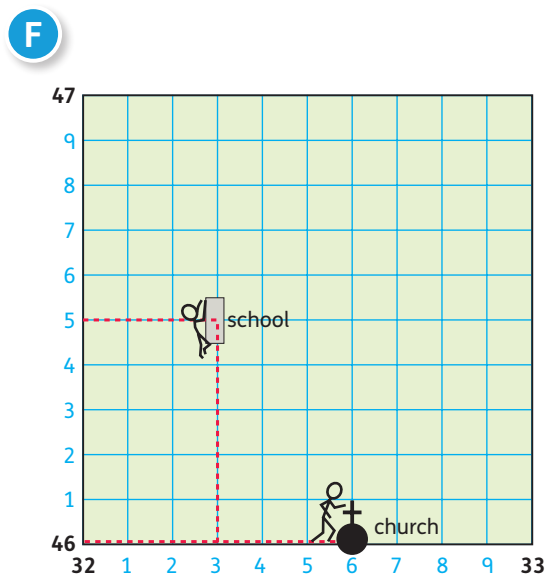
**linear scale** – a line on a map divided into equal parts, which shows how much map distance represents the real distance between places



Mickleham Village grid square



Finding a four-figure grid reference



Finding a six-figure grid reference

## Activities

## 4 Look at map B.

- Use your ruler to measure 0.5 km from the scale bar. **Identify** two places that are 0.5 km apart.
- Give** the name of the farm in grid square 3045.
- Use your ruler and the scale bar to **calculate** the straight line distances between the following places.
  - Cowslip Farm and Fredley Manor
  - Swanworth Farm and Mickleham Hall
  - The bridge near Lodge Farm and Fredley Manor
- Give** the four-figure grid references for the following places.
  - Nicols Field
  - Fredley Manor
  - Norbury Park
- Give** the two grid squares Juniperhill Wood is in.

- Identify** what is located at the following six-figure grid references.
  - 312468
  - 324457
  - 322460
- Give** the six-figure grid reference for the pub in Mickleham.
- Chip the seagull is lost. He has flown into the well in grid square 3146! **Give** the six-figure grid reference of the well so he can be rescued.

5 Now it's time for you to be a cartographer (a person who makes maps). Copy the section of the OS map and key below.

- Make up your own symbol for a campsite and locate it on your map.
- Give** its six-figure grid reference.
- Explain** your choice of location.
- Use the OS map key on page 304 to locate three other symbols of your choice. Name and give the six-figure grid references for each one.





# 1.6

## SKILLS FOCUS

# OS maps

### Key Skills

- Use and interpret OS maps
- Use and interpret aerial and ground photos

### Did you know...

The word 'corfe' comes from an old English word meaning 'cutting' or 'gap'. Look at map **B** to see the natural gap through the hilly ridge to the north of Corfe Castle, which is where the castle is located.

## Corfe Castle

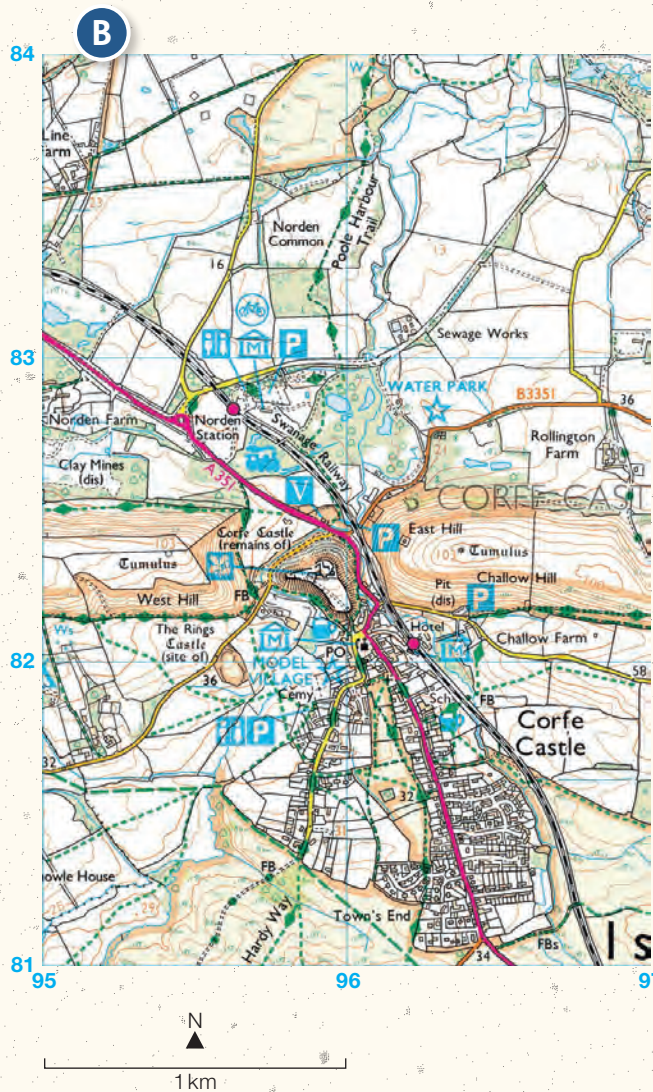
Corfe Castle is a historic village in Dorset, southern England. Photo **A** shows the castle that the village is named after. You can see that the castle was built on top of a steep-sided hill, making it easy to defend. Below the castle, towards the bottom of the photo, you can see part of the village of Corfe Castle. Can you spot the main road and a railway, too?



The castle and village in Corfe Castle, Dorset

Map **B** is an OS map showing Corfe Castle. The scale is 1:25,000. This means that 1 centimetre (cm) on the map is equal to 25,000cm (250 metres) on the ground. So, 4cm on the map is 100,000 metres (m), or 1 kilometre (km), on the ground.

Try locate the features in photo **A** on map **B**. Start by finding the castle and then use the shape of the main road to help you. Remember that you can see part of the village of Corfe Castle in the photo.



OS map of Corfe Castle (1:25,000)



### Challenge

Produce a poster advertising Corfe Castle to tourists visiting Dorset.

- Use the Internet to research additional information.
- Identify the range of attractions available to tourists.
- Use photos or sketches to make the poster attractive.

### Tip!

To find the direction in which a photographer was looking, identify a feature in the bottom centre of the photo and one in the top centre. Find these two features on the matching map. Work out the direction from the bottom feature to the top feature. This is the direction that the photographer was looking in.

## Activities

*For a handy guide to OS map symbols, see page 304. You will need to refer to this to complete the activities on this page.*

- 1 In which grid square is the castle located? Give the four-figure grid reference.
- 2 Locate the church with a tower on photo A. Now find it on the map.
  - (a) Draw the symbol used to show the church on the map.
  - (b) Give the six-figure grid reference for the church.
- 3 On the map, locate the church with a tower and the railway station in Corfe Castle.
  - (a) In what direction is the railway station from the church?
  - (b) The straight line distance between the church and the railway station is less than 250 metres. True or false?
- 4 Locate the main road on photo A. Using map B, give the number of this road.
- 5 Look at photo A. In which direction was the photographer looking? Is it north-east, north-west or south-east?

- 6 Photos C, D and E were taken in Corfe Castle. Copy and complete the table below, using evidence from the photos.

Photo	Feature in the photo	OS map symbol	Six-figure grid reference
C			
D			
E			

- 7 Look at photo F. Using this and what you've already learned about the village:
  - (a) State the features of Corfe Castle that might be attractive for tourists.
  - (b) Suggest two advantages and two disadvantages of tourism in Corfe Castle.



Corfe Castle in summer

- 8 Using photo A and map B, suggest why the castle was built on land to the north of the village.





## HOW TO...

# Cartographic (map) skills

- In this unit you will find out how to use and interpret information on different kinds of maps and photos.

## Using atlas maps

Atlas maps are useful sources of information for geographers.

- Basic maps of countries and regions of the world show physical relief, settlements and political information.
- Thematic maps show information about a specific subject, such as climate, population or tourism.



## Atlas maps

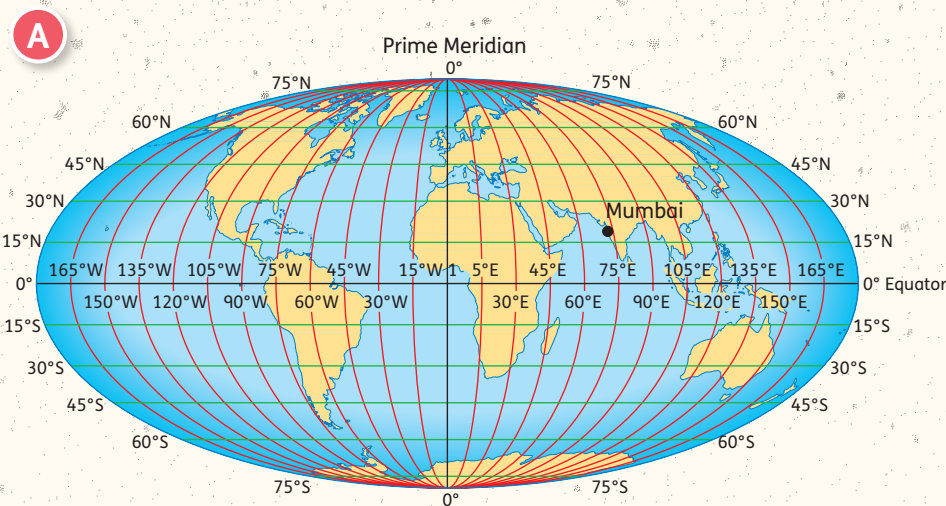
### Latitude and longitude

A place on the Earth's surface can be located by its latitude and longitude (map A).

- *Lines of latitude* run *parallel* to the Equator. This divides the world into the northern and southern hemispheres. Latitude increases north and south of the Equator to reach 90° at the north and south poles.
- *Lines of longitude* run between the north and south poles. The Prime Meridian, 0° longitude, passes through Greenwich in London. Values are given east and west of this line.

You will make use of a range of atlas resources while studying Geography. You may be asked to identify patterns or distribution on maps, so make sure you practise these skills.

- A *pattern* means there is a connection between things, for example population concentrated along the coast or buildings along a road.
- *Distribution* is a term used to describe where things are. There may or may not be a regular pattern. For example, the distribution of population in Kenya shows that most people live in the highlands where the climate is less extreme and soils are good for farming. Fewer people live on the lower ground in eastern Kenya because it is very hot and dry.



Latitude and longitude

### Tip!

Latitude and longitude are measured in degrees (using the symbol °). Each degree is subdivided into 60 minutes (using the symbol '). So, '30 minutes' (30') is half a degree.

The location of a place is given as follows:

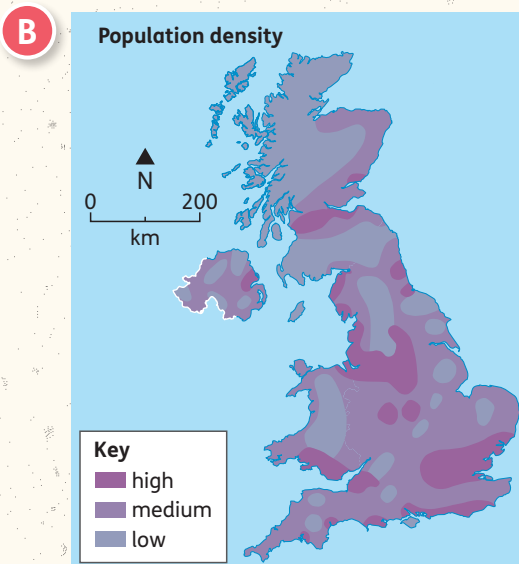
Manchester: 53° 30' N 2° 15' W

On map A, Mumbai is located at 18° 56' N 72° 51' E

## Choropleth maps

A choropleth map uses different colours or shading densities to show the distribution of data categories (map B). A choropleth map has the following features:

- The base map shows regions or areas – in map B it is areas of the UK.
- Data are divided into groups or categories. Ideally there should be 3–6 categories.
- Usually, the darker (or denser) the shading, the higher the values. This makes it easier to see the overall pattern.

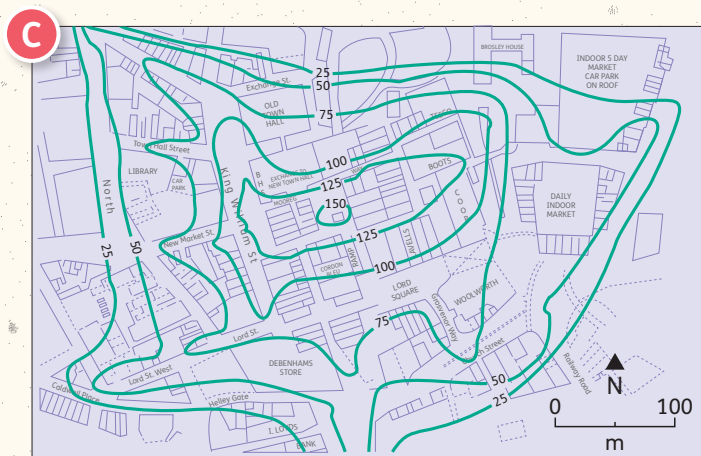


Choropleth map showing the population density of the UK

## Isoline maps

An isoline map uses lines of equal value to show patterns ('iso' means 'equal'). Some of the most common types of isoline map show aspects of weather and climate. For example, isobars show pressure and isotherms show temperature.

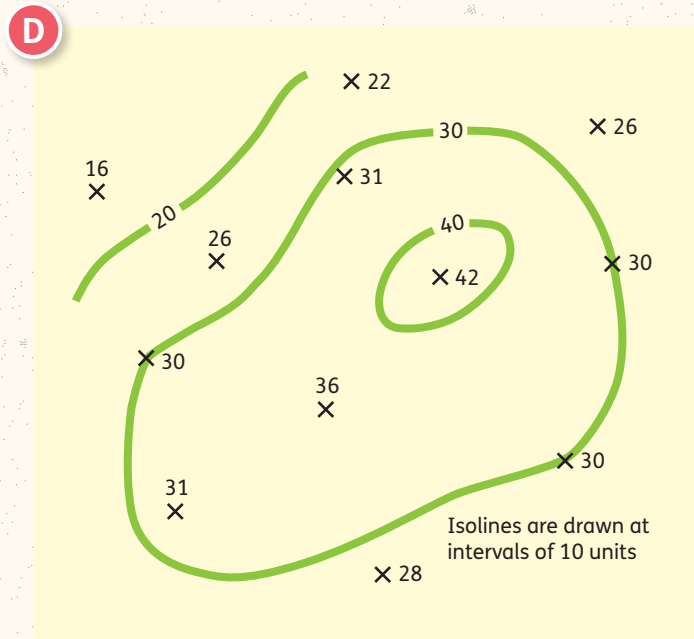
Isoline maps can be tricky to draw but they are a good way of showing patterns when added to a base map, for example, pedestrian counts at different places in a town (map C).



Isoline map showing pedestrian counts in Blackburn's town centre

To draw an isoline map:

- mark your observed data onto a base map or sheet of tracing paper
- consider how many lines to draw and at what intervals you will draw them, for example every ten units
- carefully draw each line so that the higher values are on one side and the lower values on the other side (map D).

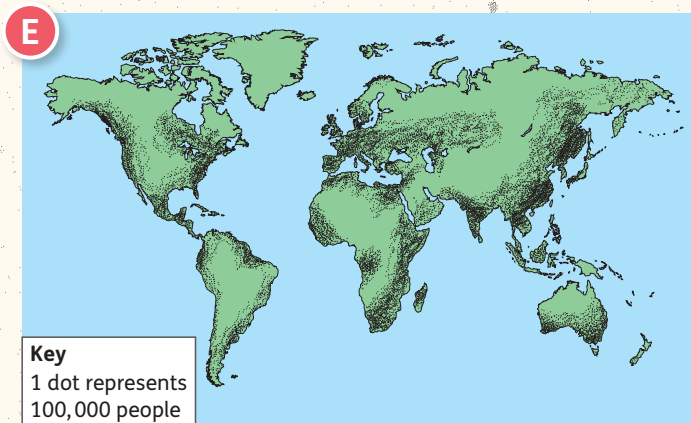


Drawing isolines



## Dot maps

Dot maps show information as individual dots on a map. Each dot can represent one or more of something. On map E, one dot represents 100,000 people.

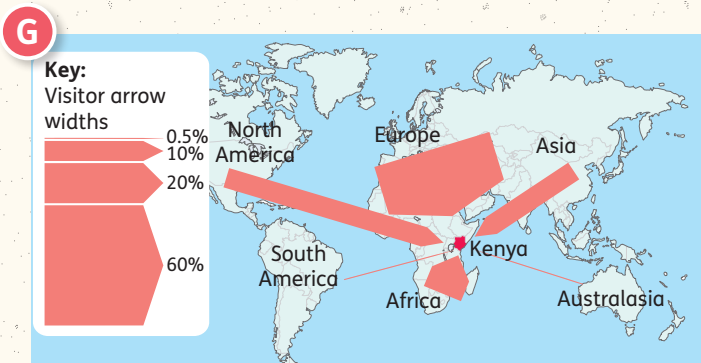


Dot map showing global population distribution

## Flow line maps

Flow line maps use lines to show the movement of people or things between different places. The arrows point from where the movement started to where it ended. Map G shows where tourists visiting Kenya came from.

The lines are of different thicknesses, and are drawn in proportion to each other. Thick lines show high amounts of movement, while thin lines show low amounts. On map G this shows that most people visiting Kenya came from Europe.



Flow line map showing the origin of tourists to Kenya

### Tip!

When drawing a flow line map, try to avoid lines crossing over each other. Don't forget to write the scale on your map.

## Desire line maps

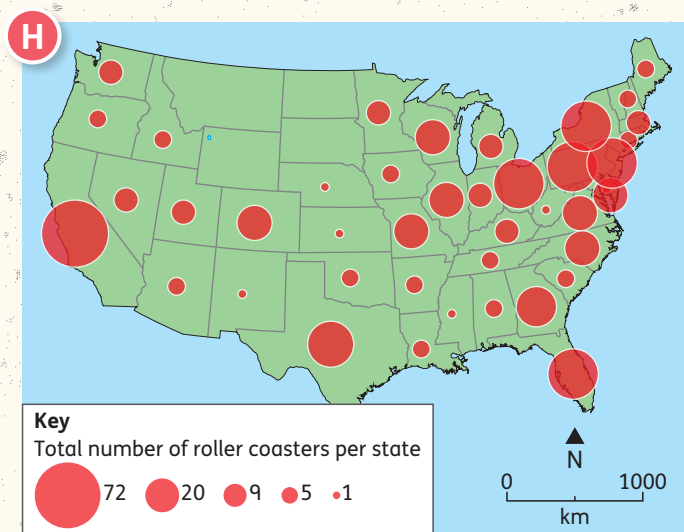
Desire lines show movement of people or goods between places (map F).



Desire line map of international flights from Heathrow

## Proportional symbols maps

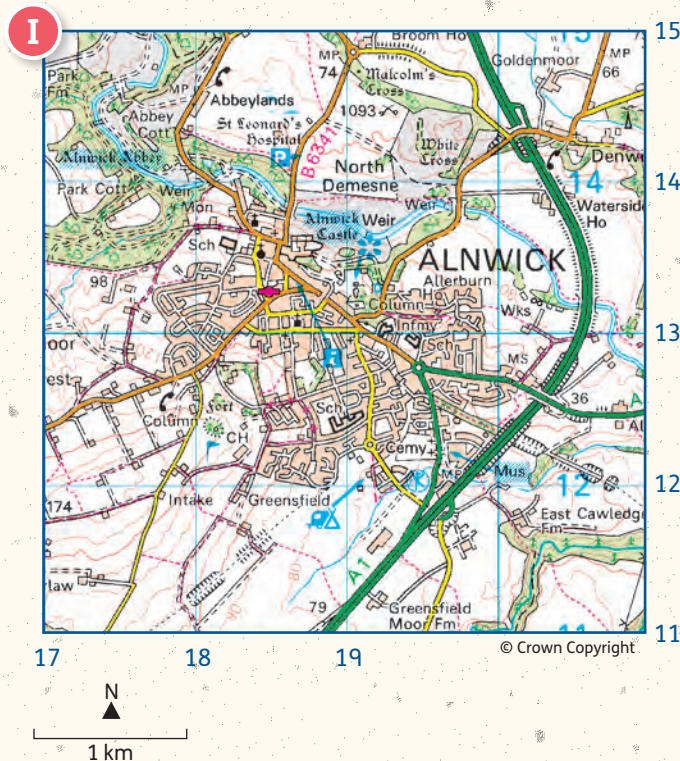
Proportional symbols (for example, circles) are a useful way to show data on a base map (map H). The sizes of the symbols are drawn in proportion to each other. On this map, the bigger the symbol, the more roller coasters there are in the state. The symbols can be difficult to draw so you will need to choose your scale carefully.



Map with proportional circles

## Ordnance Survey (OS) maps

OS maps help you to identify and describe physical and human features of a landscape. You need to be confident using OS maps at a range of different scales, including 1:50 000 and 1:25 000.

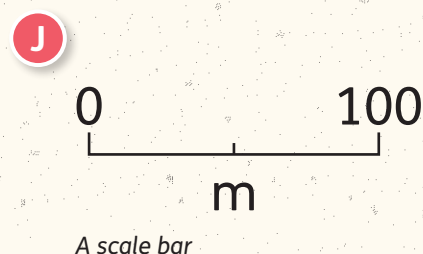


Characteristics of a small market town – Alnwick (a nucleated settlement)

### Scale

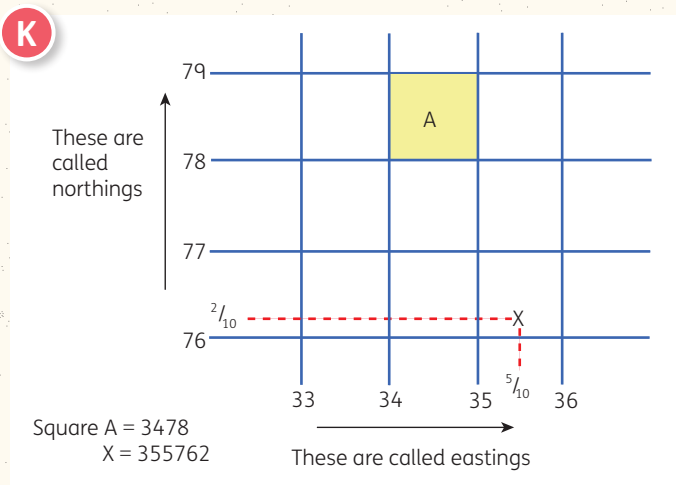
OS maps are drawn to scale. This means they accurately represent the real world. Scale can be shown using a *ratio* or a *linear scale*.

- A scale of 1:25 000 means that 1 unit on the map equals 25,000 units on the ground.
- 1:50 000 means that 1 unit on the map equals 50,000 units on the ground.



## Four-figure and six-figure grid references

Ordnance Survey maps have numbered gridlines drawn on them. The lines that run up and down are called *eastings*. They increase in value from left to right (west to east). Those that run across the map are called *northings*. They increase in value from bottom to top (south to north) (diagram K).



How to use grid references

### How to locate a grid square

To locate a grid square on a map, we use a *four-figure reference*:

- the first two digits refer to the *easting* value
- the second two digits give the *northing* value.

For example: The four-figure reference for grid square A on diagram K is 3478; grid square A is the square after the values 34 and 78.

#### Tip!

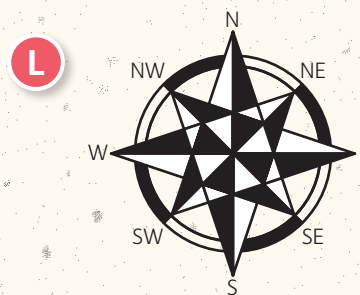
Remember to give the *eastings* value *first* and then the *northings*. Think of the phrase 'along the corridor and up the stairs'!

### How to locate a point

To locate a point, each square is split into tenths to give a *six-figure reference*. Look at diagram K and notice that point X is at grid reference 355762. Notice how the eastings value is 355 and the northings value is 762. It is the third digit of each set that gives the 'tenths' value. Thus the eastings value is 35 and 5/10ths and the northings value is 76 and 2/10ths.

## Compass directions

On most maps the direction 'north' is straight up – but not always! You should always check this in the key when using maps and diagrams. Look at diagram L. It shows the eight points of a compass. Always use compass directions carefully and precisely, for example, 'Settlement X is to the north-west of Settlement Y'.



The eight points of the compass

## Distance

Distance can be measured as a 'straight-line' or 'curved' distance (for example, along a road or a river).

### Straight-line distance

Every map has a scale, usually in the form of a linear scale – a straight line with distances written alongside. To calculate a straight-line distance, simply measure the distance on the map between any two points, using a ruler or the straight edge of a piece of paper. Then line up your ruler or paper alongside the linear scale to find out the actual distance on the ground in kilometres (diagram M).

### Curved distance

A curved distance takes longer to work out. Use the straight edge of a piece of paper to mark off sections of the curved line, converting the curved distance into a straight-line distance (diagram M).

#### Tip!

- On a 1:25 000 map, 1cm equals 25,000cm on the ground, or 250 metres. 1km on the ground equals 4cm on the map.
- On a 1:50 000 map, 1cm on the map represents 0.5km and 2cm equals 1km.
- The distance between gridlines on any OS map is 1km. On a 1:25 000 map the gridlines are 4cm apart. On a 1:50 000 map they are just 2cm apart.

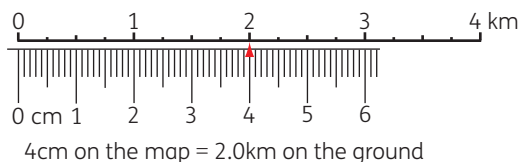
M

#### Straight-line distance

- 1 Use a ruler to measure the distance between two places on the map, in centimetres.

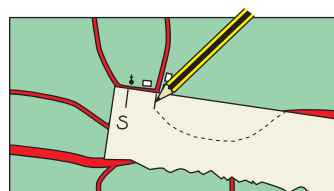


- 2 Measure out the distance on the map's linear scale to discover the distance on the ground in kilometres.

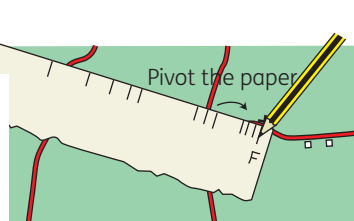


#### Curved-line distance

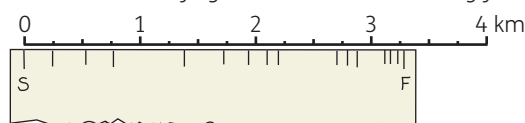
- 1 Place the straight edge of a piece of paper along the route to be measured. Mark the start with the letter S. Look along the paper and mark off the point where the route moves away from the straight edge.



- 2 Pivot the paper and mark off the next straight section. Repeat this until you reach the end of the route. Mark this finishing point with the letter F.



- 3 Place the edge of the marked paper alongside the linear scale on the map and convert the total length to kilometres. Remember to always give the units when writing your answer!





## Identifying and describing landscape and relief features

Contour patterns on maps can be used to **identify** basic physical features, such as river valleys, ridges and plateaus (diagram N). Having identified these features, you need to be able to *describe* them by referring to size, shape, height and orientation (direction).



Using contours to identify basic landscape features

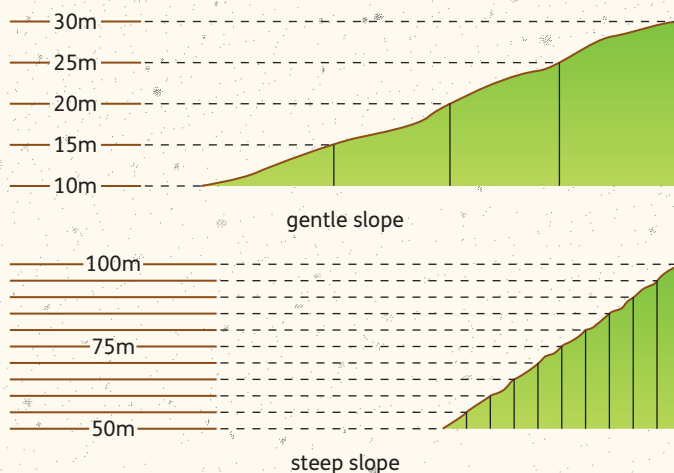
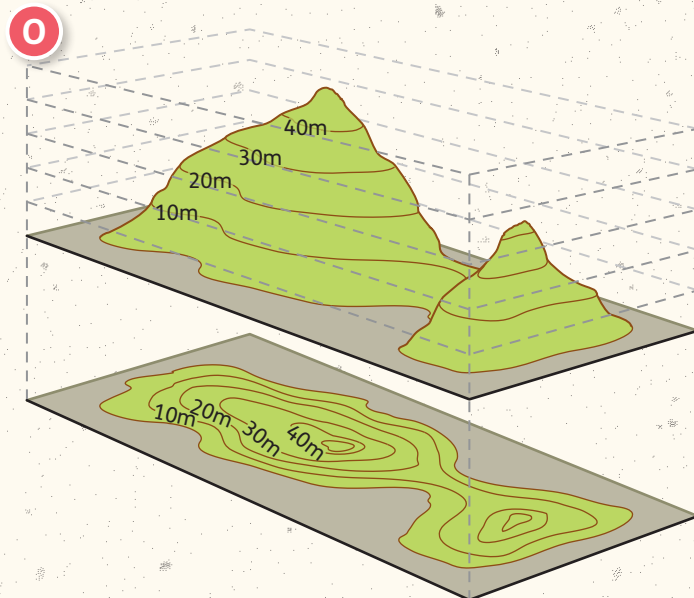
## Contours, spot heights and gradient

The height of the land is shown by:

- **contours** – lines on the map (usually brown) joining points of the same height above sea level. Where contour lines are very far apart it means the ground is flat. When they are very close together, the ground slopes steeply.
- **spot heights** – usually shown by black dots with a height above sea level written alongside.

### Example

'The ridge is about 2km wide, is orientated roughly north-south and rises to a maximum height of 232m at grid reference 376490. It has a steep eastern side and gentle western side.'



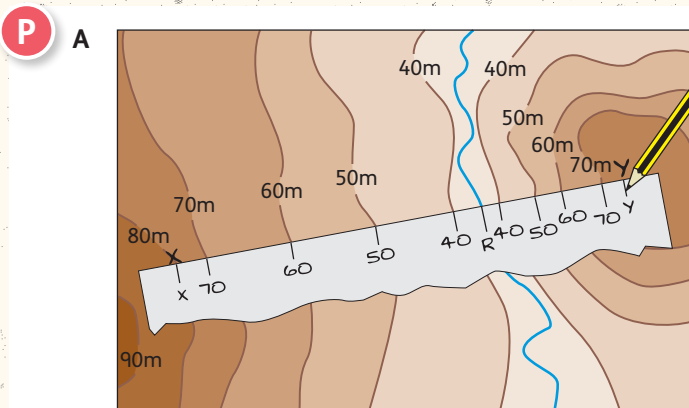
Contour lines help you understand the shape of the land as shown on a map

## Drawing cross-sections

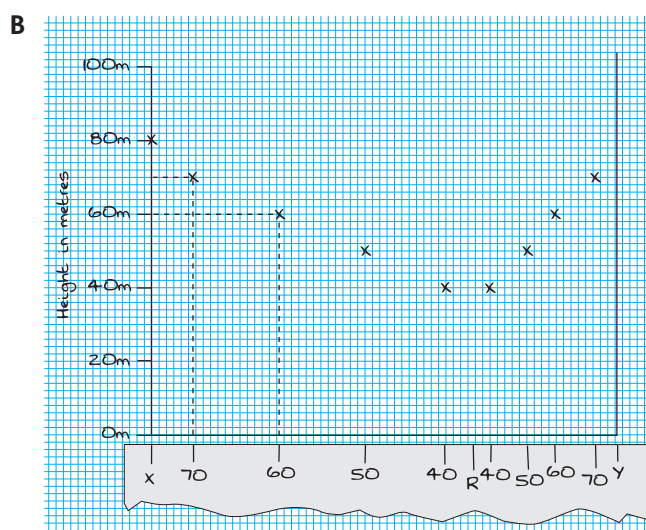
A cross-section is an imaginary 'slice' through a landscape. It helps us see what a landscape actually looks like.

You need a piece of paper, a sharp pencil, a ruler and an eraser. Check that you have:

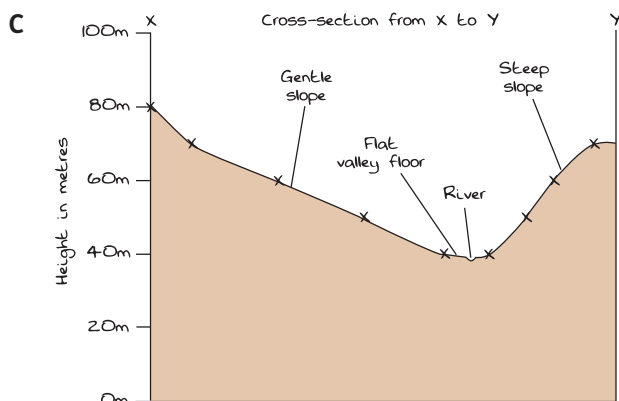
- copied height values accurately
- made your vertical scale as realistic as possible (don't exaggerate it so much that you create a totally unreal landscape!)
- completed the section to both vertical axes by carrying on the trend of the landscape
- labelled any features
- labelled axes and given grid references for each end of your section
- given your section a title.



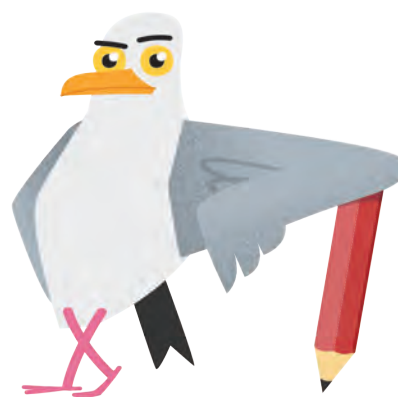
- Place the straight edge of a piece of paper along the chosen line of section.
- Mark the start and finish of your section.
- Mark contours and features, e.g. rivers.



- Draw the axes of a graph, and choose an appropriate vertical scale.
- Lay your paper along the horizontal axis.
- Mark each contour value on the graph paper with a cross.



- Join the crosses with a freehand curve.
- Label any features.
- Give your cross-section a title.



How to draw a cross-section

## Interpreting physical and human features

### Relief

*Relief* describes the ups and downs of a landscape. When describing relief you should refer to:

- The height of the land, using figures taken from contours or spot heights.
- The slope of the land. Is it flat, or sloping? Which way do the slopes face? Are the slopes gentle or steep? *Remember to give precise information such as grid references and compass directions.*
- Features such as valleys or ridges. *Refer to names and grid references.*

### Drainage

Drainage describes water on a map. When describing the drainage of an area, you should comment on:

- Whether there are any rivers. Which way are they flowing? (Hint: look at the contours.) *Give the names of the rivers.*
- The pattern of rivers.
- Evidence of underground drainage, in the form of springs or wells.
- The presence of lakes.

### Settlement

There are three types of settlement patterns (diagram Q):

- *Dispersed settlements* – buildings spread out over a large rural area.
- *Nucleated settlements* – high-density settlements, tightly packed and often focused on a central point such as a major road intersection. The settlement typically spreads out in all directions.
- *Linear settlements* – these usually stretch out along a road.

### Communication

Communication networks include many kinds of transport, such as:

- roads
- railways and footpaths
- ferries
- airports
- cycleways.

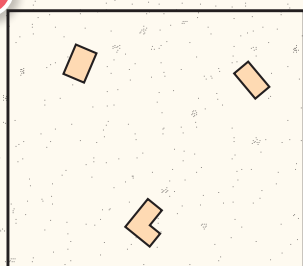
When describing communication networks try to give locations, directions and patterns.

Communication networks often reflect the relief of an area.

- Major transport routes such as roads, canals and railways tend to follow flat, low ground, which explains why they are often in river valleys.
- Footpaths often follow river valleys, as well as link settlements.



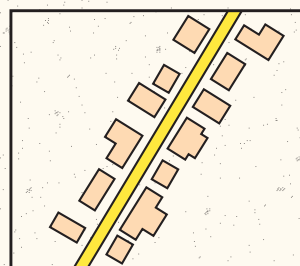
Dispersed



Nucleated



Linear



Settlement types

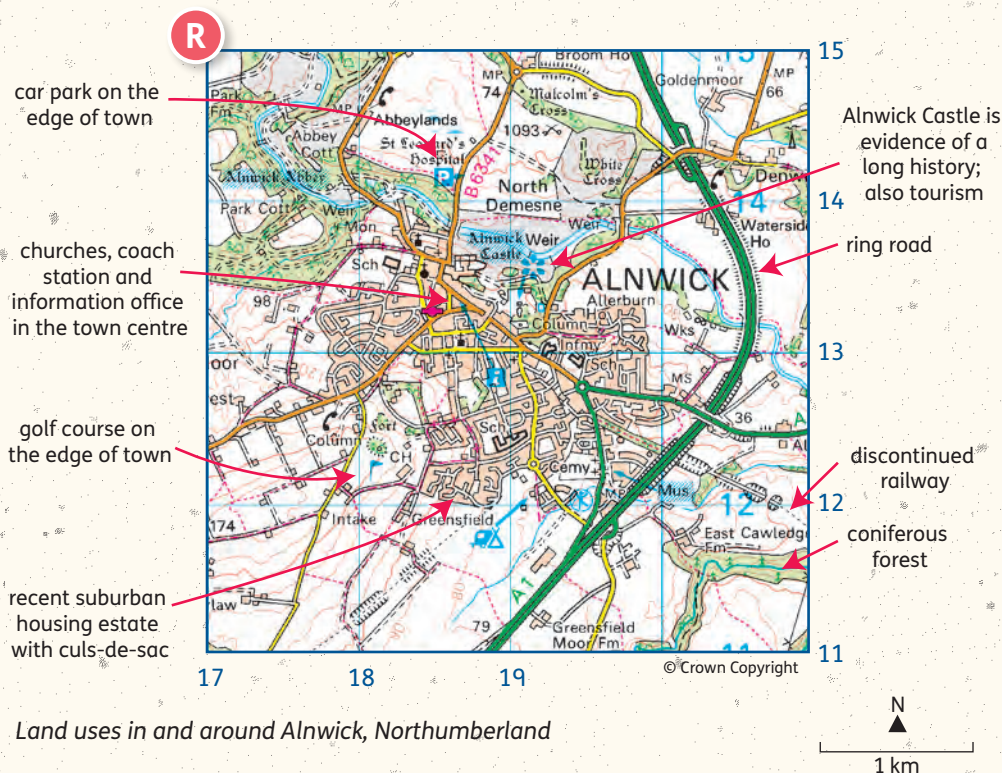


## Land use

Land use is the way that land is used by people. Try to give specific examples from the map to support your statements.

Typical land uses include:

- different types of woodland (for example, coniferous or non-coniferous)
- coastal deposits (mud, sand or shingle)
- vegetation (for example, scrub, bracken or marsh)
- urban areas (settlement patterns)
- fields (often just shown white on maps)
- industrial areas
- recreation areas.



Look at map R. Can you spot any other land uses?

## Using photos

Photos are widely used in the study of geography. They can be used on their own or with maps.

Geographers make use of three different types of photo

### Ground photos

Photos taken on the ground (**S**) are the most common types of photo and are usually used to focus on a particular physical feature or characteristic, such as a building or a waterfall.



A ground photo of a waterfall

### Aerial photos

These are usually taken from aeroplanes, helicopters or drones, looking down on a landscape (**T**). They often show large areas that can be related directly to OS maps – for example showing settlements or stretches of coastline.



An aerial photo of Leicester

### Satellite photos

Like aerial photos, these look directly down onto the Earth (**U**). They are often used to show weather features, such as hurricanes.



Satellite photo taken from space showing a hurricane

## Drawing sketches from photos

The purpose of a sketch is to identify the main features of a landscape (photo V):

To draw a sketch, follow these steps:

- Draw a frame that is the same shape as the photograph.
- Draw one or two bold lines to act as guidelines for the rest of your sketch. For example, you could draw the profile of a hill, road or river.
- Consider what it is that you are trying to show and concentrate on that feature or aspect – it may be river features or the pattern of settlements.
- Now complete your sketch by drawing other important landscape features.

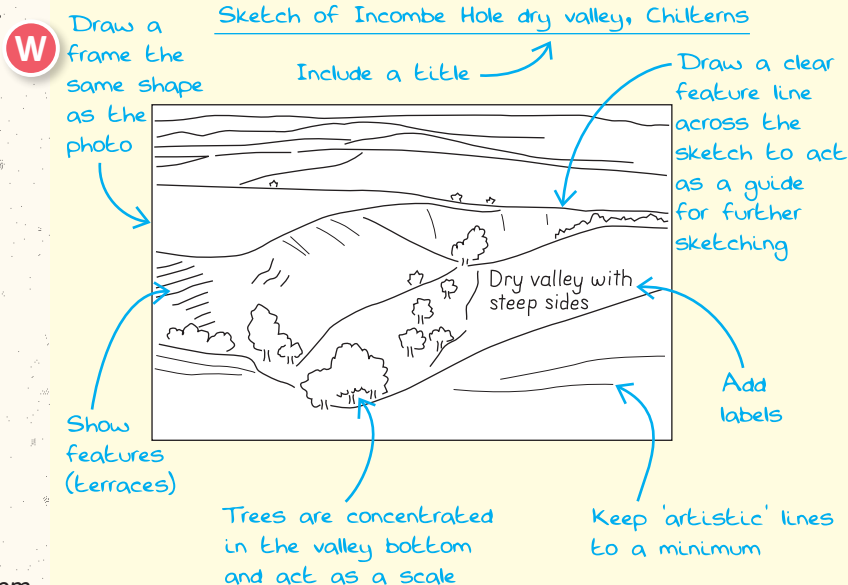


Sketching from a photo

## Labels and annotations

You should always try to add labels or annotations to diagrams, maps, graphs, sketches and photos.

- Labels – these usually identify features, for example, a waterfall.
- Annotations – these may include some detailed description and explanation; for example, 'The waterfall is vertical and high, probably because it is made of hard rock'.



## Drawing sketch maps

A sketch map is a simple version of an OS map. It should focus on just a few key features, such as roads or rivers, without lots of other information.

To draw a sketch map, follow these steps:

- 1 Start by drawing a frame, either to the same scale as the map, or enlarging or reducing it.
- 2 Divide the frame into grid squares as they appear on the map. Write the grid reference numbers around the edges of your frame. These will act as your guidelines when you draw your sketch.
- 3 Using a pencil, carefully draw just the features that you need onto your sketch.
- 4 Label and annotate your sketch as necessary.
- 5 Don't forget to include a scale (which can be approximate), a north point and a title.

