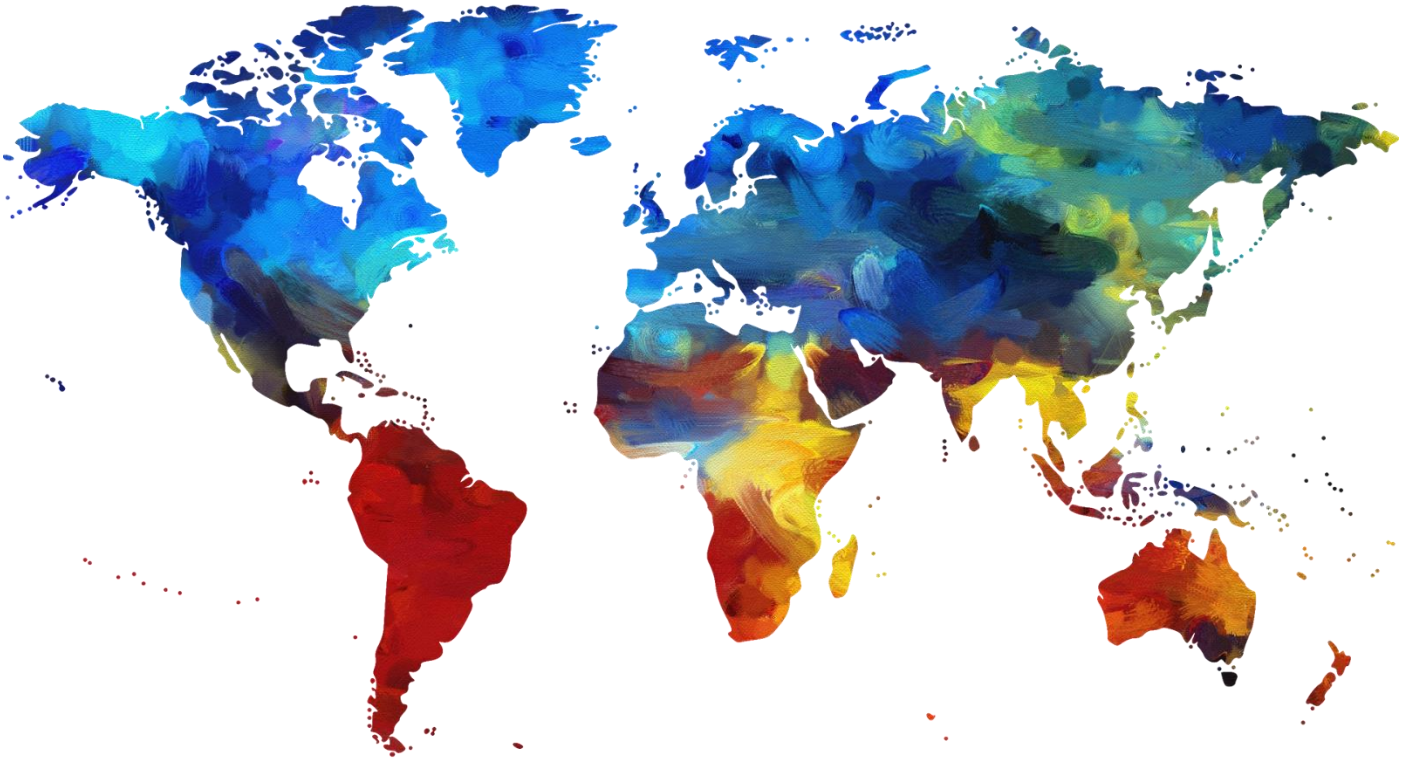
AQA Geography



Geographical Skills Booklet

Checklist and Resources

Skills Checklist

Cartographic skills		R	A	G
Atlas maps				
1	use and understand coordinates - latitude and longitude			
2	recognise and describe distributions and patterns of both human and physical features			
3	Using maps of global and other scales identify and describe significant features of the physical and human landscape on them, e.g. population distribution, population movements, transport networks, settlement layout, relief and drainage			
4	analyse the inter-relationship between physical and human factors on maps and establish the associations between observed patterns on thematic maps			
Ordnance Survey maps				
5	use and interpret OS maps at a range of scales, including 1:50 000 and 1:25 000 and other maps appropriate to the topic			
6	use and understand coordinates: four and six figure grid references			
7	use and understand scale			
8	use and understand distance (straight and curved line)			
9	use and understand direction			
10	use and understand gradient			
11	use and understand contours			
12	use and understand spot height			
13	use and understand numerical and statistical information			
14	identify basic landscape features and describe their characteristics from map evidence			
15	identify major relief features on maps and relate cross-sectional drawings to relief features			
16	draw inferences about the physical and human landscape by interpreting maps such as patterns of relief, drainage, settlement, communication and land-use			
17	interpret cross sections and transects of physical and human landscapes			
18	describe the physical features as they are shown on large scale maps of coasts			
19	describe the physical features as they are shown on large scale maps of rivers			
20	infer human activity from map evidence such as tourism			
Maps in association with photographs				
21	be able to compare maps			
22	sketch maps: draw and label			
23	sketch maps: understand and interpret			
24	use and interpret ground photos and maps			
25	use and interpret aerial photos and maps			
26	use and interpret satellite photos and maps			
27	describe human and physical landscapes (landforms, natural vegetation, land-use and settlement) and geographical phenomena from photographs			
28	draw sketches from photographs			
29	label and annotate diagrams, maps, graphs, sketches and photos			
Graphical skills				
1	select and construct appropriate graphs and charts to present data using appropriate scales. Graphs and charts may include:			
	line charts			
	bar charts			
	pie charts			
	pictograms			
	histograms with equal class intervals			
	divided bar			
	scatter graphs			
	population pyramids			
2	suggest an appropriate form of graphical representation for the data provided			
3	complete a variety of graphs and maps such as:			
	choropleth			
	isoline			

	dot maps			
	desire lines			
	proportional symbols			
	flow lines			
4	understand and use gradient, contour and value on isoline maps			
5	plot information on graphs when axes and scales are provided			
6	interpret and extract information from different types of maps, graphs and charts such as:			
	population pyramids			
	choropleth maps			
	flow line maps			
	dispersion graphs			
Numerical skills				
1	demonstrate an understanding of number, area and scales, and the quantitative relationships between units			
2	design fieldwork data collection sheets and collect data with an understanding of accuracy, sample size and procedures, control groups and reliability			
3	understand and correctly use proportion and ratio, magnitude and frequency			
4	draw informed conclusions from numerical data			
Statistical skills				
1	use appropriate measures of:			
	cumulative frequency - median			
	mean			
	range			
	quartiles and inter-quartile range			
	mode and modal class			
2	calculate percentage increase or decrease			
3	understand the use of percentiles			
4	describe relationships in bi-variate data:			
	sketch trend lines through scatter plots			
	draw estimated lines of best fit			
	make predictions			
	interpolate trends			
	extrapolate trends			
5	be able to identify weaknesses in selective statistical presentation of data			
Use of qualitative and quantitative data				
Examples of types of data:				
1	maps			
2	fieldwork data			
3	geo-spatial data presented in a GIS framework			
4	satellite imagery			
5	written and digital sources			
6	visual and graphic sources			
7	numerical and statistical sources			

Section 1- Cartographic Skills

Confidence in…	R	A	G
How to read 4 figure grid references			
How to read 6 figure grid references			
How to read and follow directions			
How to draw cross sections using OS maps			
How to annotate cross sections showing height and degree of slope and simple contours.			
How to recognise and describe distributions of vegetation, land use and communications.			
Describe and identify site, situation and shape of settlements.			
Understand types of human activity from OS maps e.g. tourism			
Use maps in association with photographs, sketches and written directions.			
Use and understand latitude and longitude			

Ordnance Survey (OS) Maps

The table below shows a number of things that can be read off an OS map.

Map Information	**Source**	**Can you put a number on it?**	**Comment**
Altitude	Contours and spot heights	Yes- contour lines and spot heights.	Avoid terms such as mountain unless you are sure. Use comparative comments.
Relief	Contours and distances	Yes- measure the gradient	Often confused with altitude. Use terms like flat, steeply sloping and undulating.
Aspect- direction that a slope faces	Contours and compass points	Yes- use the compass point e.g. a south west slope facing.	Scale might obscure detail of local variation.
Surface drainage	Rivers, lakes, drainage ditches	Yes- work out the length of streams in a given area.	Not all rivers are marked on maps.
Land use	Use of map symbols- marsh, moor, bare rock, woodland etc. Can only infer usage of white areas. Same in urban areas- some uses are obvious (tourist information) but others are not.	Yes partially- Work out the percentage coverage of a particular land use.	Deduction possible but conclusions will always be tentative. Beware of reading too much into place names.
Geology and soils	Can only infer these using other categories	No	As above- land use may be a key indicator here.

Settlement size	Area of settlement only, not their population	Yes. Measure the area occupied by a town or city, or even the percentage of an area occupied by housing.	No clues about density because the height of buildings or how many occupy them is unknown.
Settlement form	Shape from map	No	
Settlement distribution	From map	Yes. You can measure distances between settlements	Use distances for measurements- one grid square = one square kilometre
Settlement function	A few guesses possible using other information	No	Use tourist information, location, route ways as clues.
Transport and communication systems	Roads, tracks waterways and railways.	Partially you can describe the shape of a network.	No clues about usage of these transport systems. Many forms of communication are not shown e.g. the internet and telecommunications.

Map Symbols

It is possible to read certain things from the map. A key is always included in exam questions so recognising symbols should not be a problem (one has also been included for you at the back of this booklet). However, it is important to at least learn some of the basic symbols so that map reading becomes easier.

- Green bits mean woodland (various types)
- Blue areas are either water, tourist information or motorways
- Roads are colour coded.
  Blue= motorways, red= A roads, orange/ brown = B roads, yellow= local roads and white=tracks
- Contours are thin brown lines that join areas of equal height at 10 metre intervals e.g. 10m, 20 m and 30 m above sea level.
- To help with height area post heights on a map. Little black dots with figures next to them.

In each box, draw the correct symbol, which is used to represent the word on an ordnance survey map. You will need to use an OS map key to complete this task.

Church or chapel	Cemetery	Quarry
Main Road	Marsh	Rivers
Motorway	Coniferous Wood	Windmill
Footpath	Camp Site	Mixed Woodland
Parking	Radio/ TV Mast	Deciduous woodland
Information Centre	Buildings	Public convenience

4 figure grid references

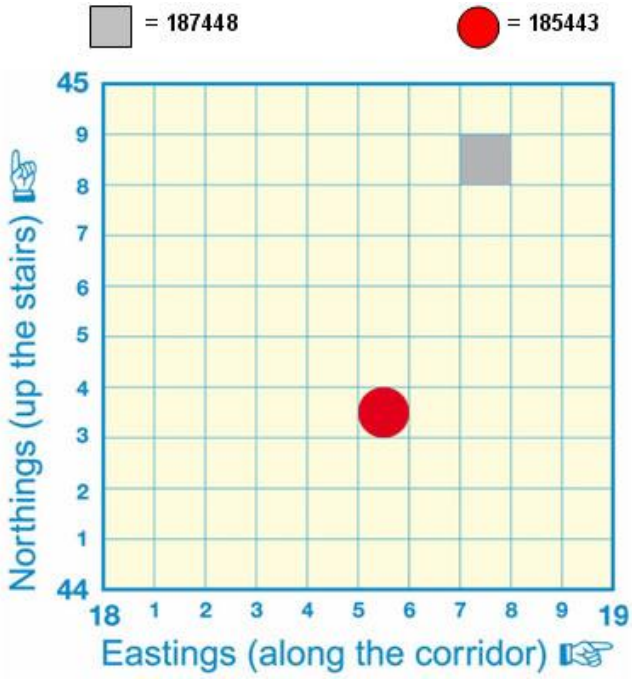
When giving a four-figure grid reference, you should always give the eastings number first and the northings number second, very much like when giving the reading of a graph, where you give the x coordinate first followed by the y.

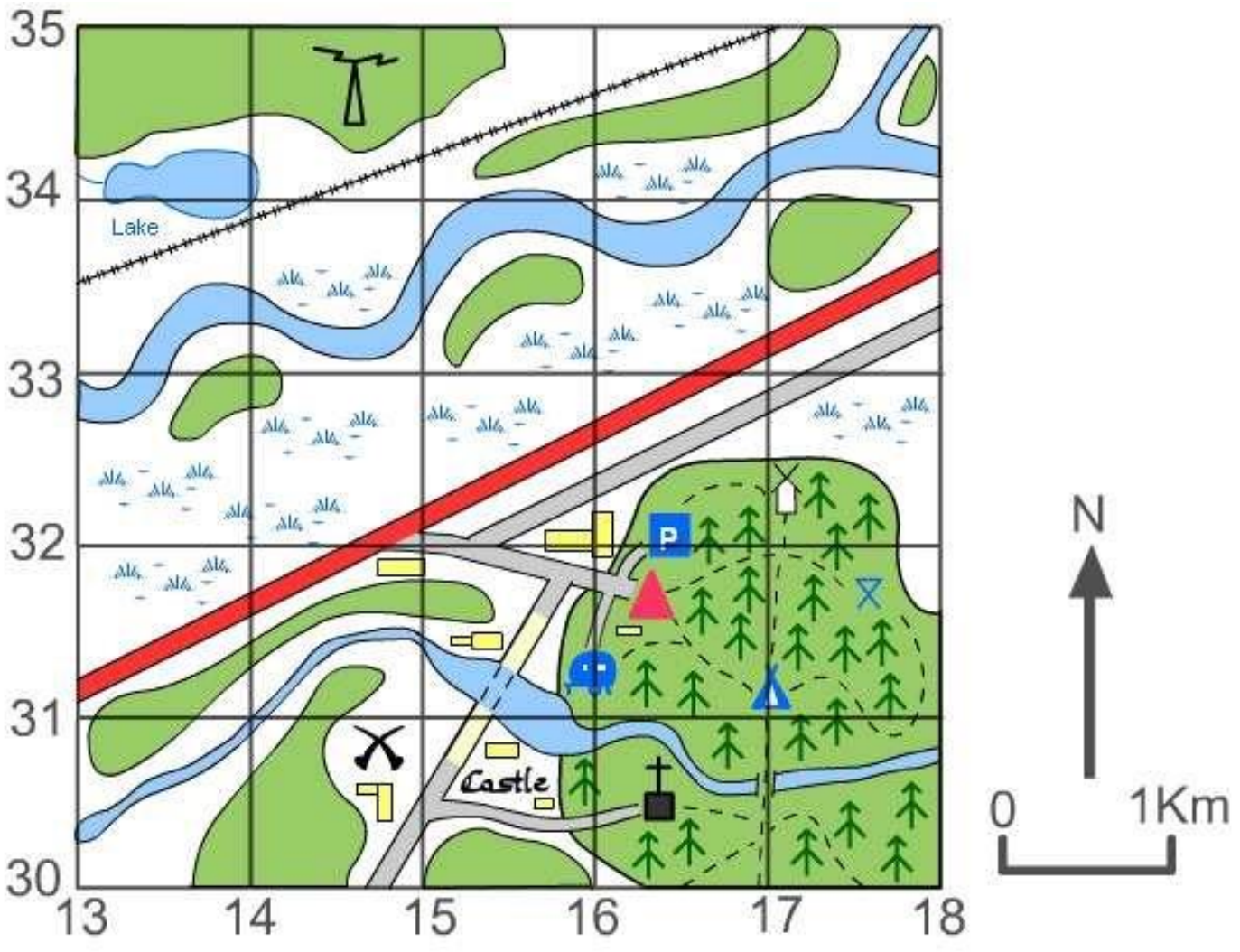
An easy way to remember this is that to get the first number, you go along the corridor (horizontal, x axis, eastings) and then up the stairs (vertical, y axis, northings).

6 figure grid references

To get the six-figure grid reference, you have to imagine that the four-figure square is further divided up into tenths.

In the example below, the grey box is in the four-figure grid reference square '18 44', but more accurately it is 7 tenths across and 8 tenths up within that larger grid square, therefore the six-figure map reference is '187 448'.





Using the grid on the previous page write down the 6 figure grid reference of the following:

Picnic Site Castle

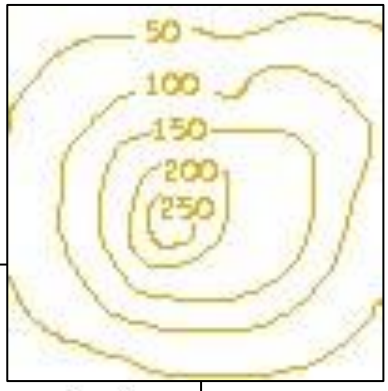
Youth Hostel Camp Site

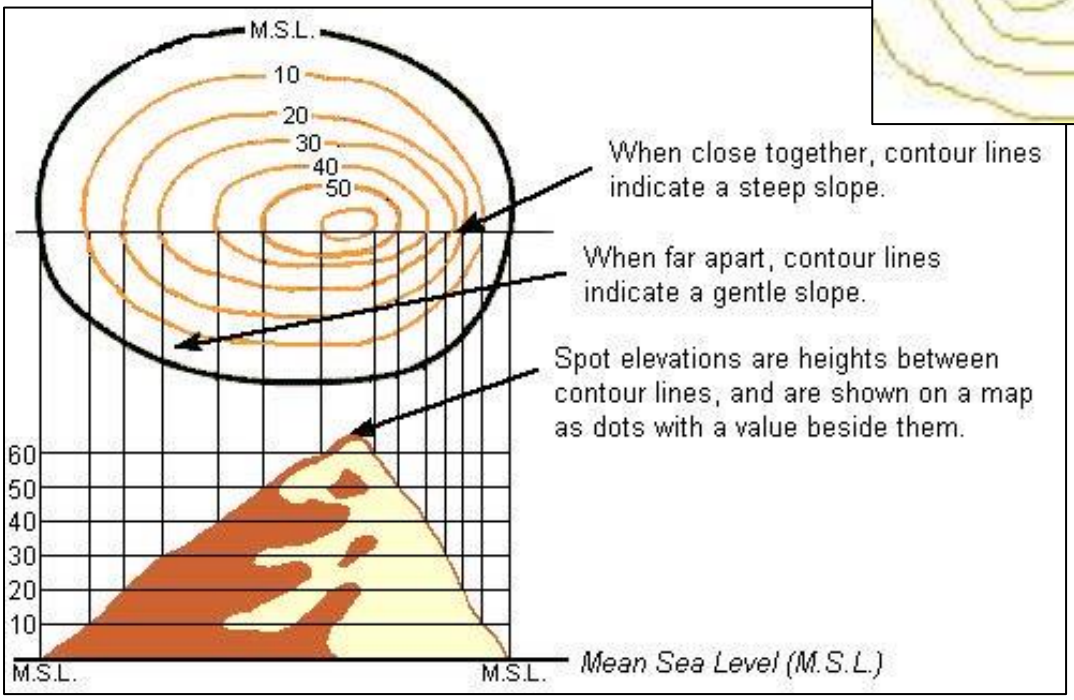
Church with a tower Car Park

Height on a Map

Contour lines are a map's way of showing you how high the land is. They join together places of the same height and form patterns that help us to imagine what the land actually looks like. Contour lines are shown in 10 metre intervals.

Lines that are close together show a steep slope.
Lines that are far apart show slopes that are gentle.





Spot heights are an extremely simple way of showing height on a map. Simply, they are a black spot with the height in metres printed next to it. The spot marks the exact place on the map that is at the height shown by the numbers (the numbers do not mark the place at that height).

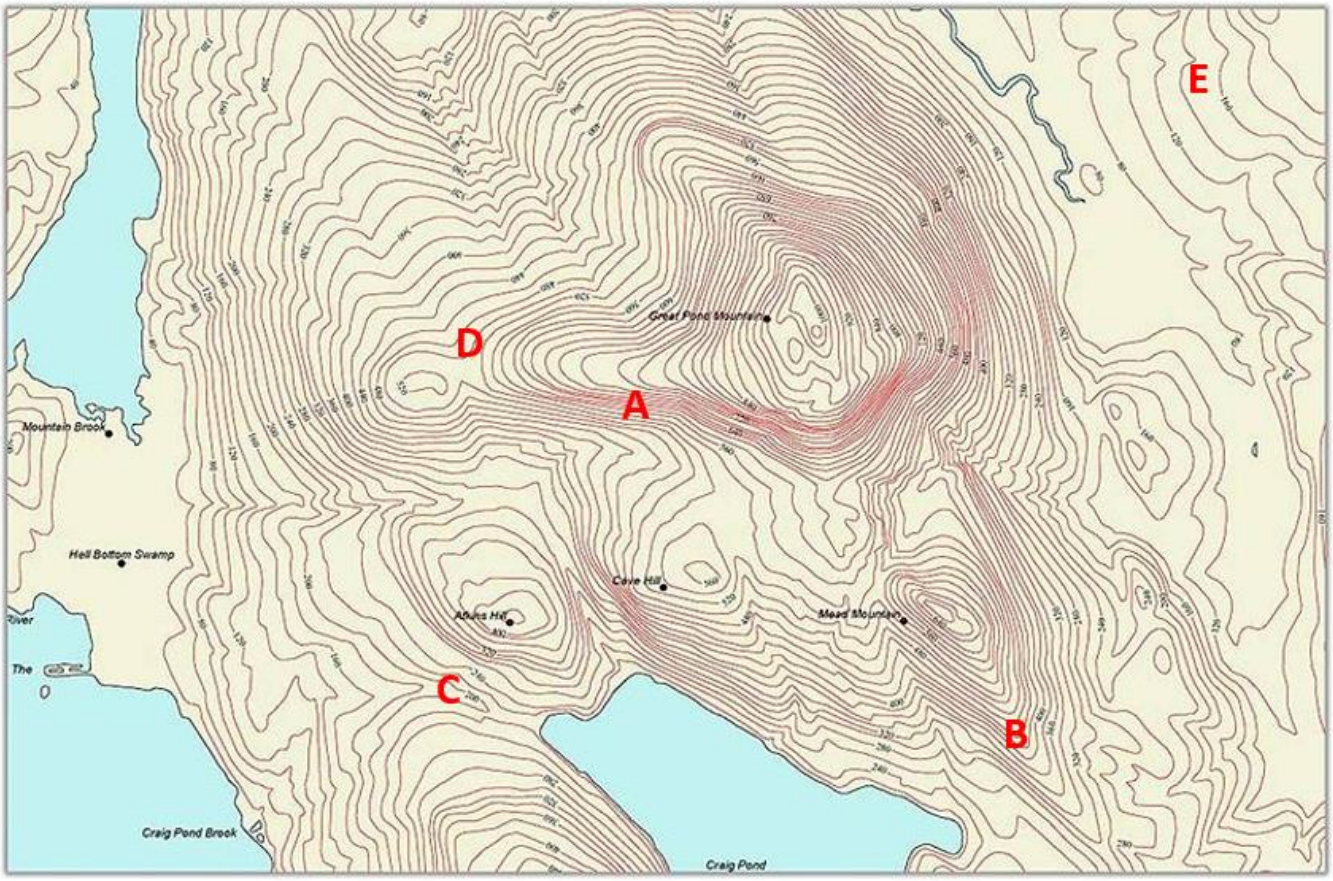
The second diagram shows a special kind of spot height, called a triangulation pillar (a blue triangle with a blue spot in the middle). These are printed with a height at that point, and represent a point on the land where a height marker has been put on the land.

Match the feature to the description

Feature	Description
Hill	A gentle slope
Spur	A finger of high ground
Gentle Slope	An isolated area of high ground
Plain	A steep slope
Plateau	A flat lowland area usually quite large
Steep slope	A flat-topped area of high ground often with steep sides
Valley/Gap	An upland ridge with one steep slope (scarp) and one gentle slope (dip slope)
Escarpment	A dip in the landscape between uplands often containing a river at the bottom

Using the descriptions above interpret the landform represented by the letters on the map.

a)
b)
c)
d)
e)



Map used courtesy of MapXpert, https://en.wikipedia.org/wiki/File:Cntr-map-1.jpg

Cross Sections

A cross section shows the topography (variations in relief) of the land. In other words what the land will look like if you take a slice through it. Cross sections show several aspects of the landscape and they can be annotated to show variations in slope angle, height and any other features that are of interest e.g. locations of settlements, roads and rivers.

Heights can be read off contours, but take care as contours are shown in 10 metre intervals. Spot heights can help you out here, for example a hill top might be 109 metres.

To draw a cross section to show the relief of the land:

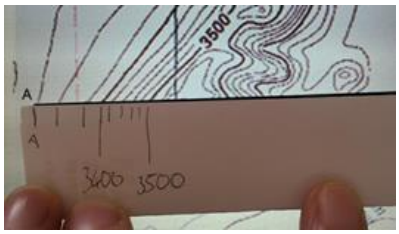
1. Take a straight piece of paper.

2. Put the edge of the paper along the cross section A–B line.

3. On the paper, mark the end points A and B.

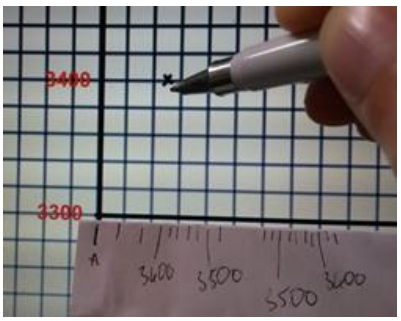
4. Every time the contour lines cross the edge of your paper, make a mark (photograph 1). If the contour

1



line has a number, note this as well. On this American map, the contour lines increase in intervals of **200 feet**.

2

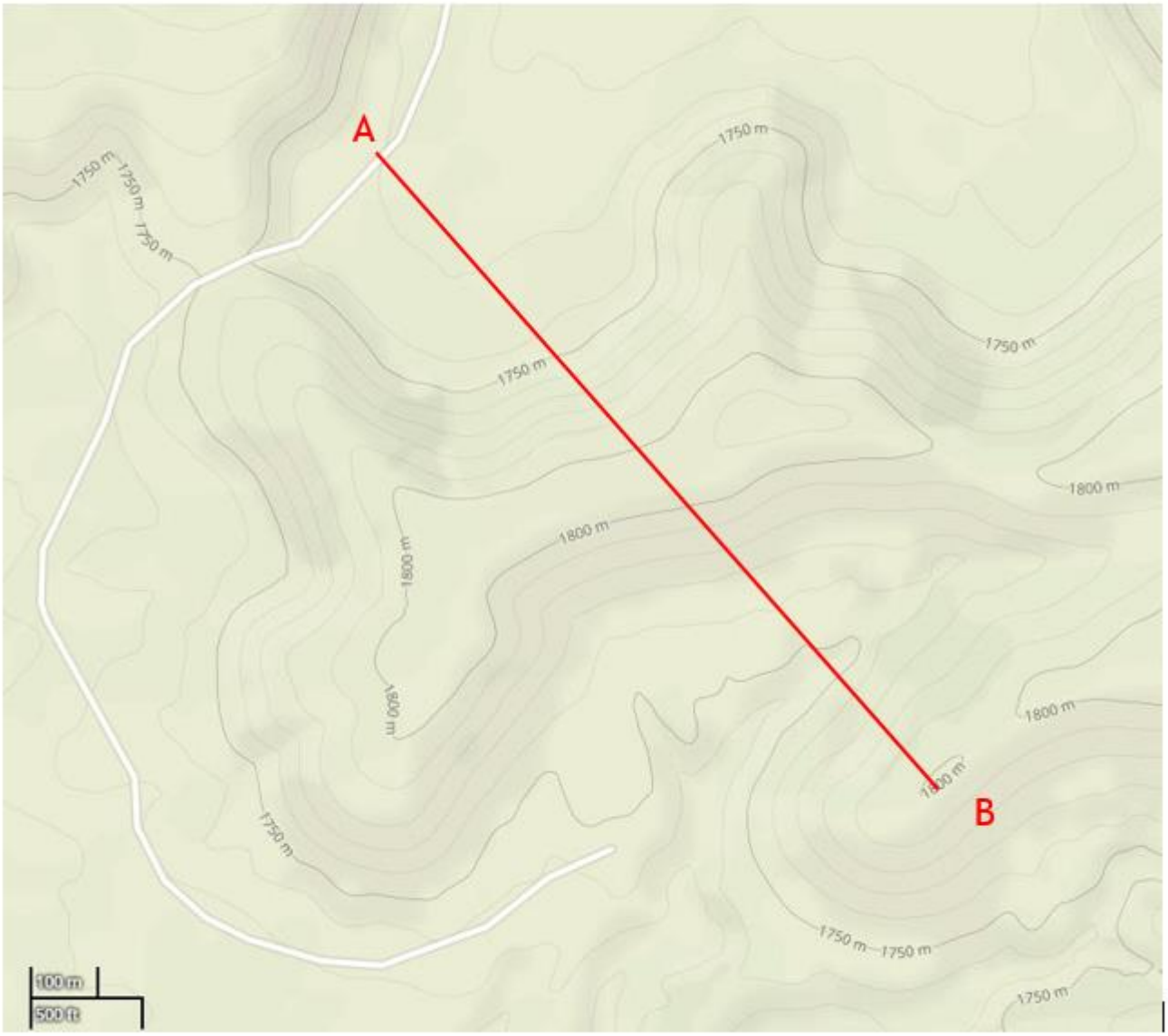


5. Use your piece of paper like the X-axis of a graph. For the Y-axis, make a scale to show the contour heights (photograph 2).

6. Use the marks on your paper to plot the cross section and join the points together.

Draw the cross section from A to B using the map below. The contour interval on this map is 10 metres.

Explain the route of the road shown in white.



Map used courtesy of the US Geological Survey
http://ngmdb.usgs.gov/maps/TopoView/viewer/#16/42.6676/-104.6379

Sketch Maps

Sketch maps can be valuable to students completing a geographical investigation. They simplify what is shown on published maps (such as Ordnance Survey) by only showing the features that are of interest. As such unnecessary detail is ignored and the map is easier to interpret.

The key to a sketch map is to know exactly what it is for.

- Is it to show how to get to a location?
- Is it to show how key features of a location may impact upon field work?
- Is it to show a particular event or aspect of an area?

Accurate sketch maps can be useful to locate the study area, summarize results, and serve as important base maps. It isn't important to keep to an exact scale, but some idea of distance will be helpful.

Method for drawing sketch maps:

(1) draw a box the same shape as the map area you are using
(2) sketch in the main relief features, main rivers, woodland areas, and main routeways
(3) mark and label (or add a clear key) the main features you want your map to show
(4) add a title, north direction, and use colour.

Figure 1 An example of simple sketch map

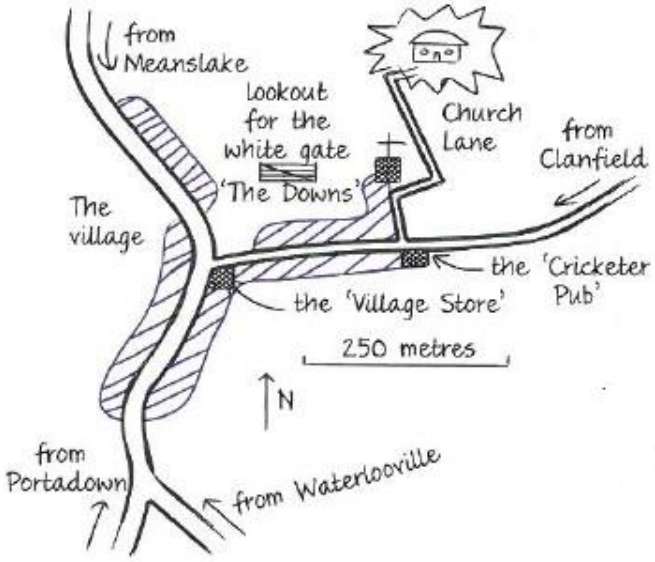
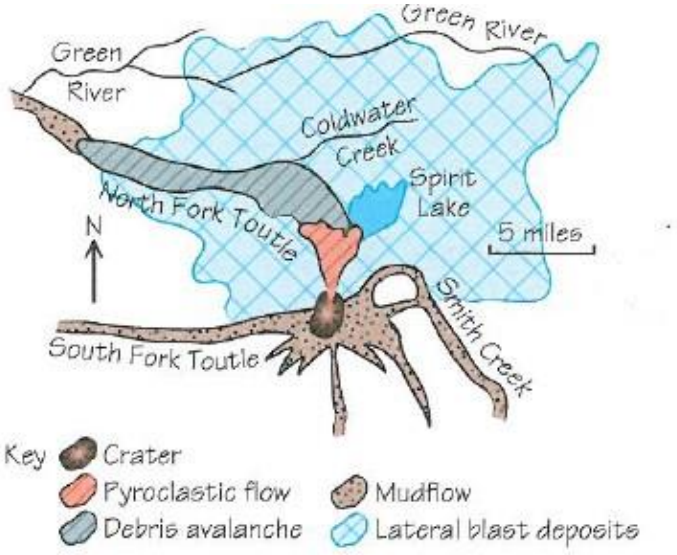
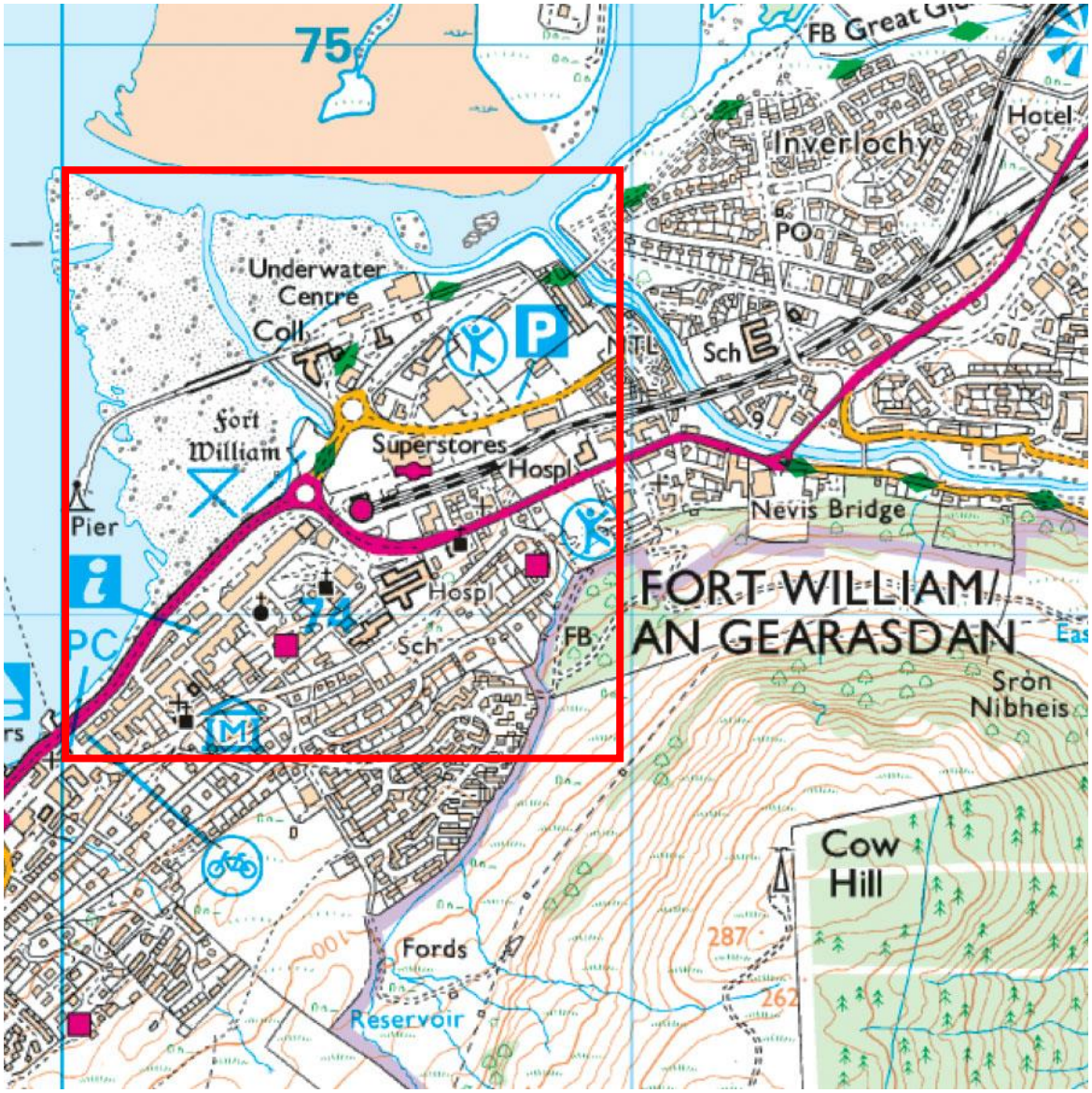


Figure 2 An example of a detailed sketch map with a key to show an event





Study the Ordnance Survey (OS) map extract of Fort William.
Create a sketch map in the space below of the area shown in the red square.

Describing OS maps

You may be asked to describe:

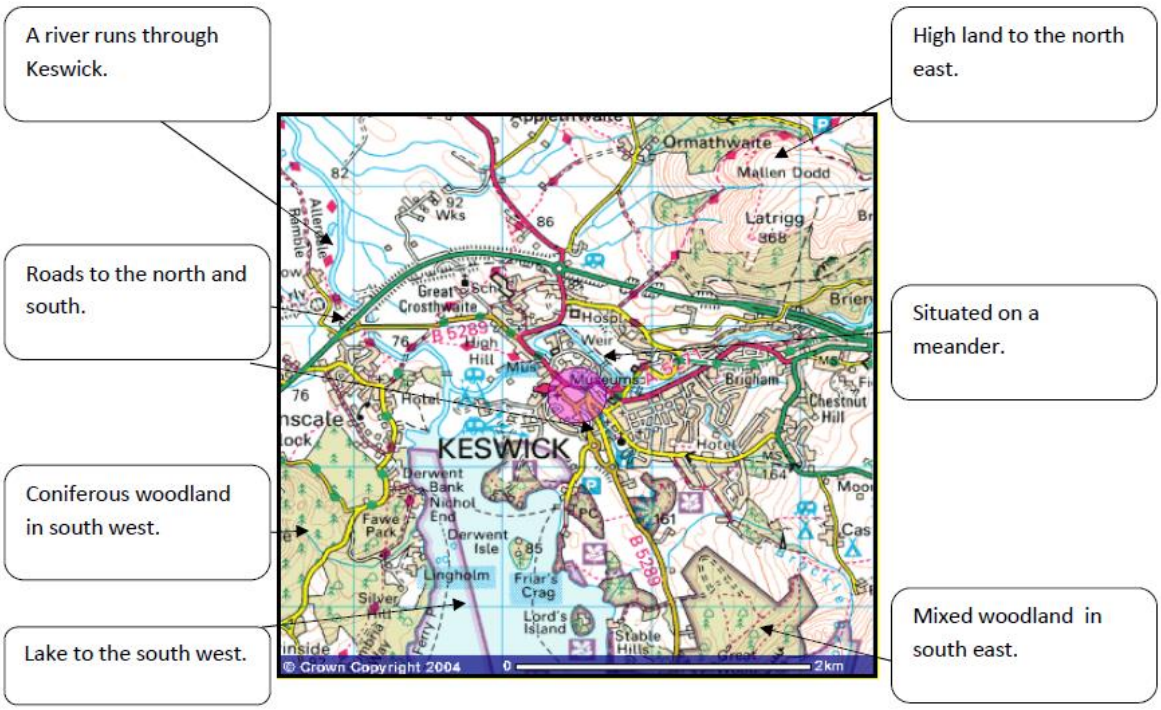
- Site
- Situation
- Shape
- Land use

What is it and what should your description refer to?

Site: the physical characteristics of the land upon which a settlement lies.	Include references to relief, drainage, vegetation.
Situation: where a settlement lies in relation to other features or settlements.	Include references to human and physical features. Locate the settlement in terms of distance and direction from these features. Does a river, road etc run through it?
Shape: the shape of a settlement (not the land upon which the settlement lies).	Describe the shape of settlement (see diagram overleaf). Does it follow any particular features e.g. roads, rivers, valley floors etc?
Land use: how the land is being used.	Describe how the land is being used. Refer to the main land use in the OS map. Land uses could include residential, industrial, agricultural etc.

For each description refer clearly to map evidence e.g. name features, identify features with the use of grid references and refer to the area of the map you are focusing upon by direction.

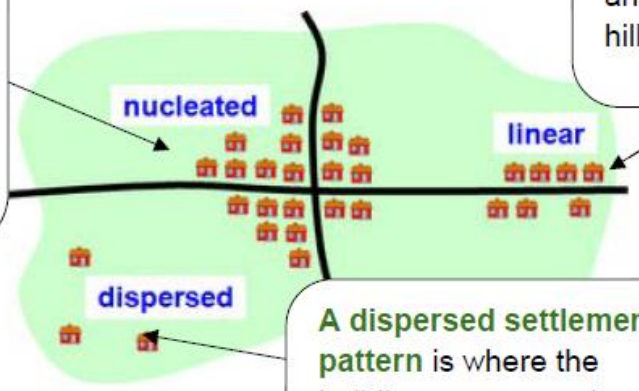
Example



Describing settlement shape and pattern.

A nucleated settlement pattern is where a lot of buildings are grouped together and is often found in lowland areas.

A linear settlement pattern is where the buildings are built in lines and is often found on steep hillsides.



A dispersed settlement pattern is where the buildings are spread out and is often found in upland areas.

Apply the tips and information above to complete the following:

Describe the shape of Shirenewton. (3)

Describe the land use in the OS map extract. (3)

Describe the situation of Shirenewton.

Describe the site of Shirenewton.

Latitude and Longitude

Lines of latitude and longitude are used to locate places accurately on the Earth's surface.

Lines of **latitude** circle the Earth in an **east-west** direction. They are **parallel** to the equator.

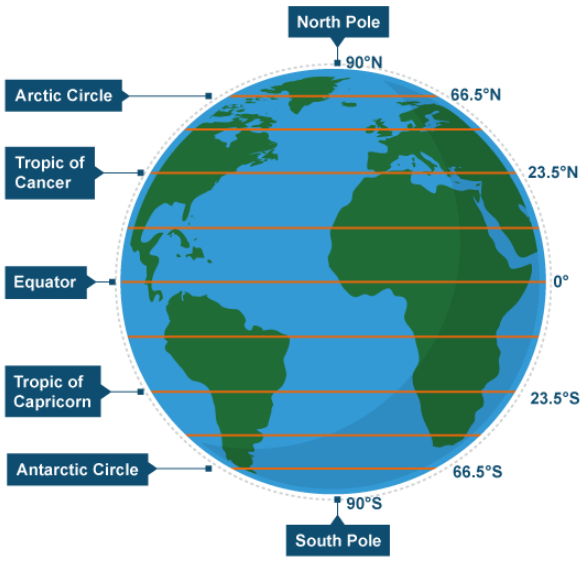
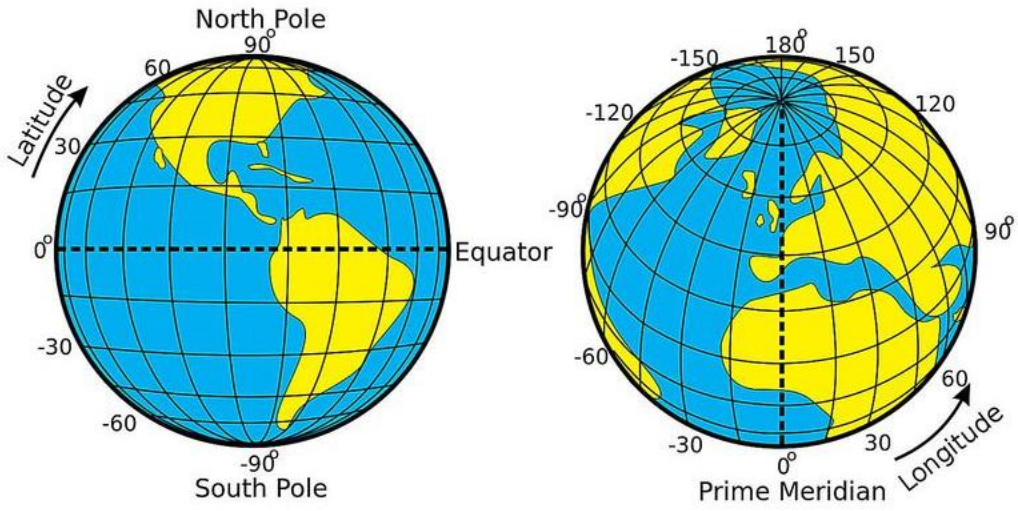
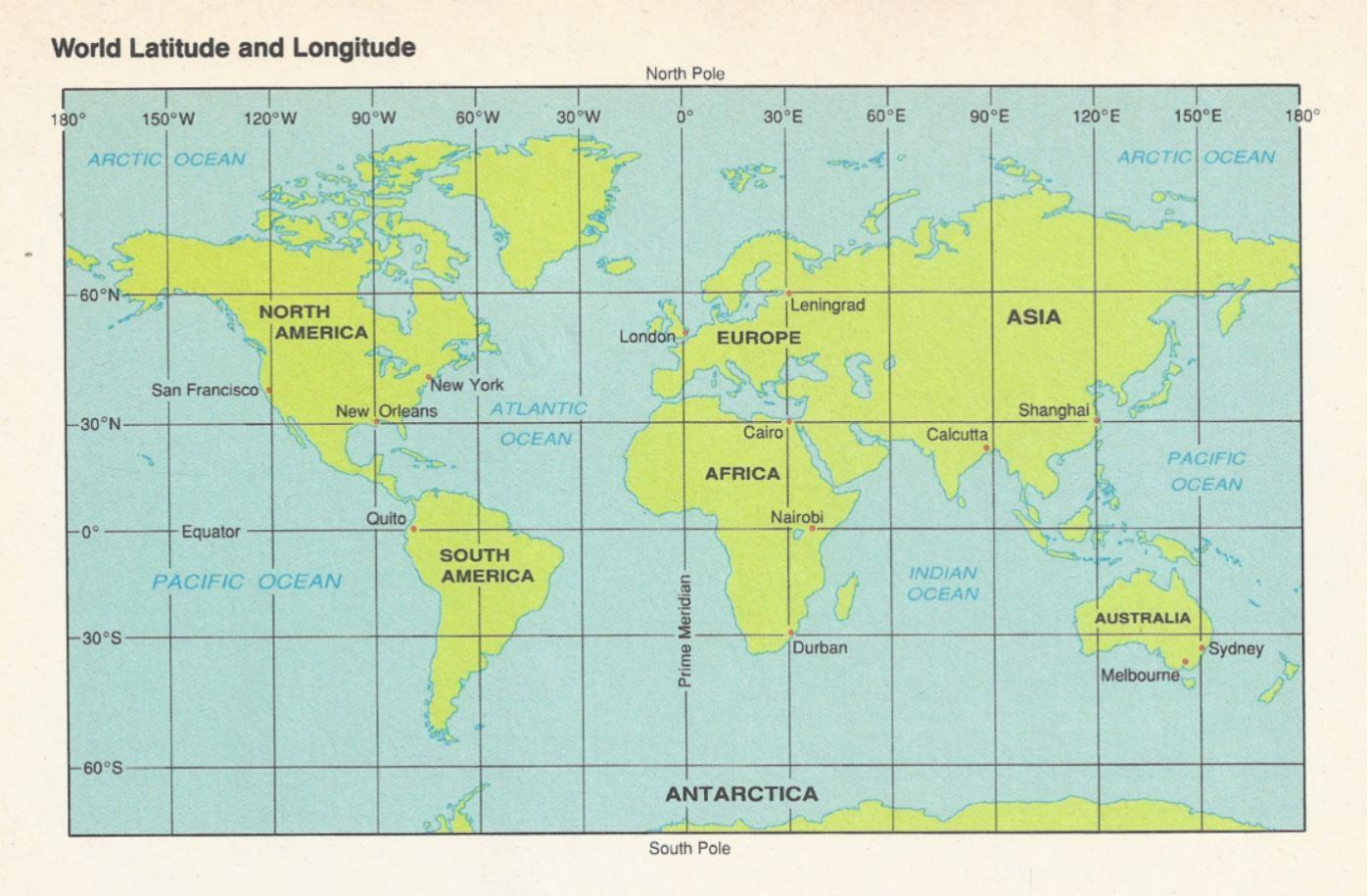


Figure 1 Lines of latitude

Lines of **longitude** run from **north to south**. They are not parallel as lines of latitude are - they meet at a point at the north and south poles and are called meridians.



When finding the latitude and longitude coordinates you go north or south from the Equator first, then east or west from the Prime Meridian.



Use the map to answer the following questions.

(1). On what continent would you find each of the following locations?

a. 60°N, 100°W _____ b. 60°N, 100°E _____

c. 20°S, 60°W _____ d. 20°N, 20°E _____

(2). Give the coordinates for each city.

a. Shanghai, China _____ b. Durban, South Africa _____

c. New York, USA _____ d. Sydney, Australia _____

Section 2 Basic skills

	R	A	G
How to label and annotate diagrams, maps, graphs and sketches			
How to draw sketches and annotate them			
How to interpret different types of photographs			
How to describe the distributions and patterns from atlas maps and OS maps			
How to recognise and describe patterns of vegetation, land use and communications			
How to describe the site, situation and shape of settlements			
What can be inferred from maps about the human activity in an area, including tourism			
How to use maps with photographs, sketches and written directions			

Labelling and annotating diagrams, maps, graphs and sketches

Labelling is simply indicating a feature.

Figure 3

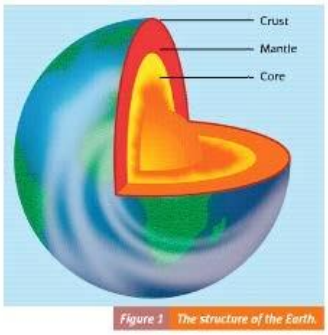


Figure 1 The structure of the Earth.

Annotation involves adding some notes to explain something such as the processes that brought about that feature

Figure 4

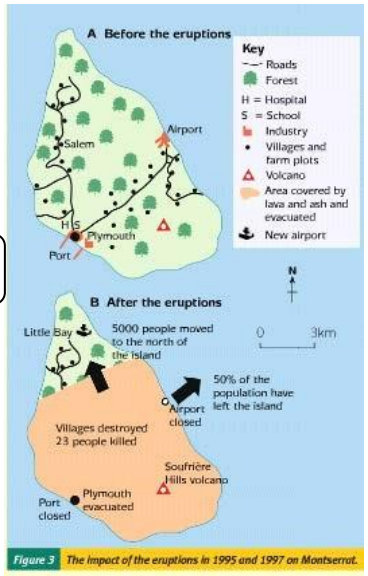


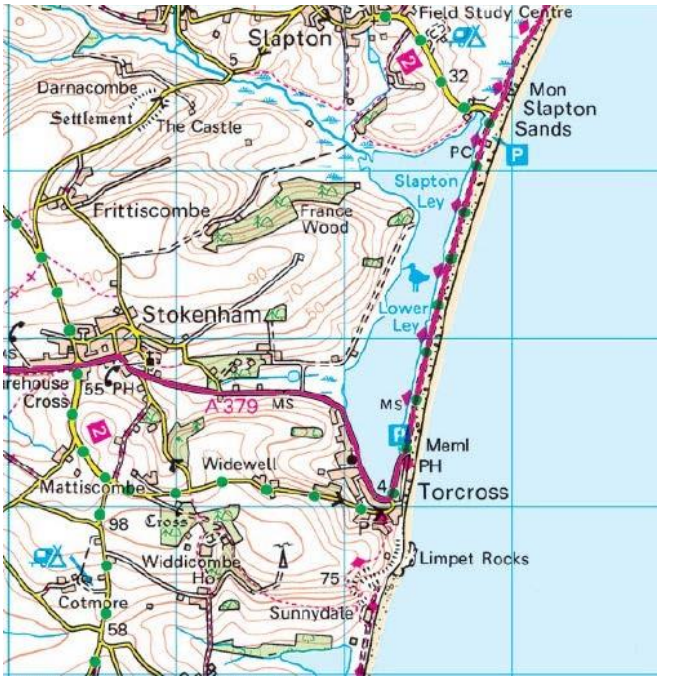
Figure 3 The impact of the eruptions in 1995 and 1997 on Montserrat.

Field sketches (drawn in the field) or sketches drawn from photos are useful to identify particular features. They are useful as they simplify an area. They do not need to be perfect works of art (phew!). Remember you are geographers and as such you can add detail to your sketch through labels and annotations.

Study figures 1 and 2 of Slapton Ley

Figure 3: Photograph taken in grid square 8241.

Figure 2: OS map extract of Slapton Ley and surrounding area.



a) Identify the location on the map with an X where the photograph in Figure 1 may have been taken from.

b) Complete the task below using Figures 1 and 2.

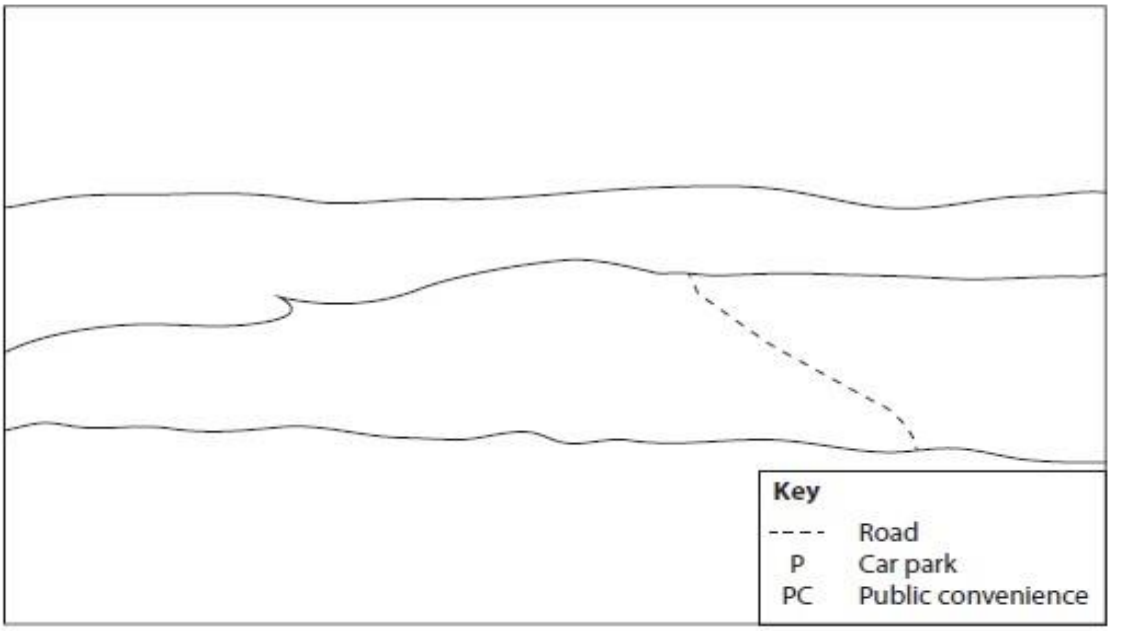


Figure 1c

Complete the sketch by adding the following features:

(4)

- the outline of Slapton Ley
- the bar (beach).

Using the key provided, label the following features in the correct positions on the sketch:

- the car park at Torcross
- the public convenience at Slapton Sands.

Study Figure 3 and 4.

Figure 4 OS map of Warkworth and Amble

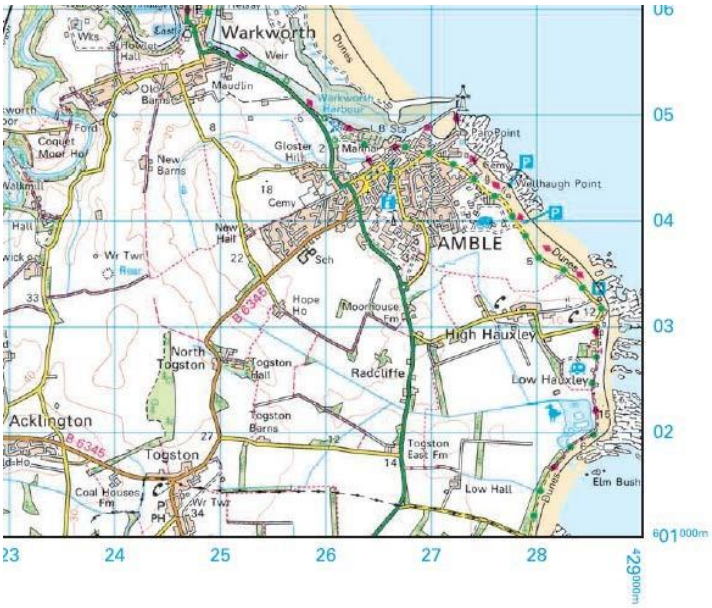
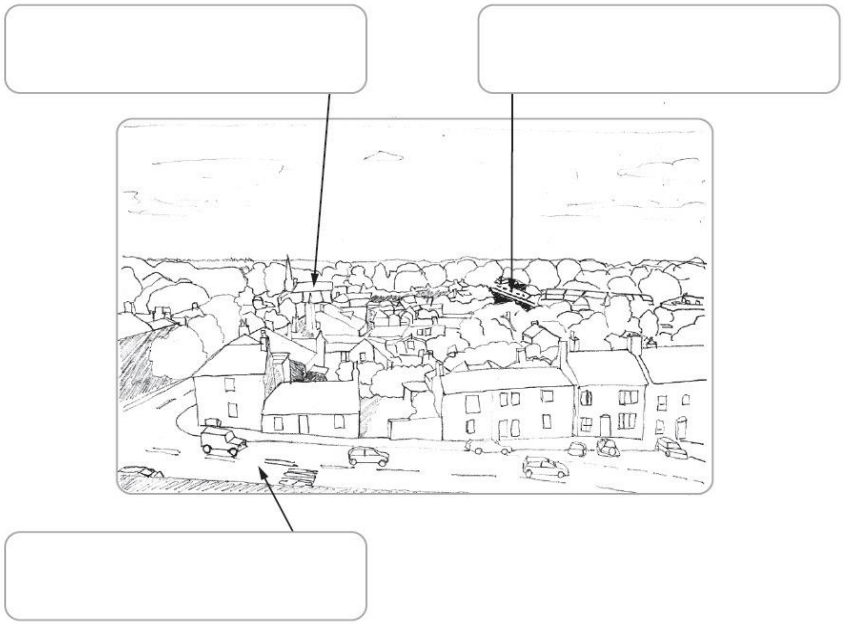


Figure 5 Photograph taken in grid square 2405

a) Identify the location on the map with an X where the photograph in Figure 4 was taken

b) In the boxes provided, use figures 3 and 4 to name the features marked on the field sketch.



Using Aerial and Satellite Photographs

Aerial and satellite photographs are used to show an area or a landscape. Such photographs hold huge amounts of information, some of which is not obvious and therefore labels and annotations are needed to identify key features and to make a point.

You may be asked to identify or describe characteristics shown in an aerial or satellite photograph.

Characteristics could mean the shape, the form and the distribution of key features.

Look at the satellite images of Las Vegas.

a) describe the characteristics of the city

Section 3 Graphical Skills

	R	A	G
How to complete a range of graphs and charts			
How to interpret a range of graphs and charts			
Know the advantages and disadvantages of using different geographical techniques.			

Read through each technique to present data and highlight key points for each technique

Rose diagrams

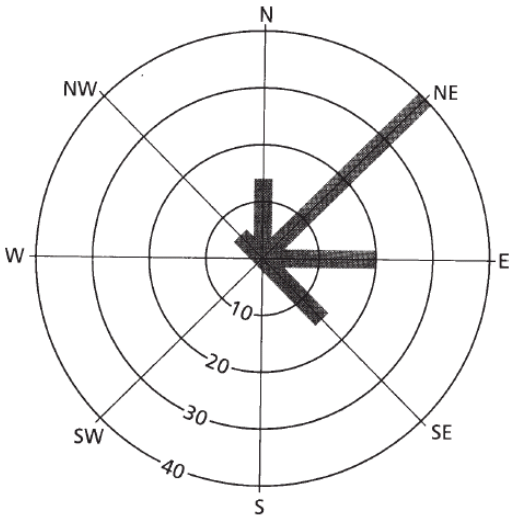
A polar graph or rose diagram is used to show direction as well as magnitude. For example, the diagram below shows that most corries in the Lake District face northwards and eastwards, and by reading off the scale (located between the south and south-west points) it can be seen that 40 corries face in a north-easterly direction, 20 in an easterly

direction and 15 in a northerly direction

Polar graphs are easy to construct.

• Using a compass and protractor, draw in lines that correspond to north, north-east, east, south-east, south, south-west, west and north-west.

The orientation of corries in the Lake District



• Draw a scale. The scale relates to the radius of the diagram, e.g. in the above diagram 1 cm represents 10 corries. Circles are drawn at I cm intervals.

• Mark the scale on the vertical axis (north axis). In the diagram above, the scale has been marked between south and south-west.

• Plot the data for each directional sector.

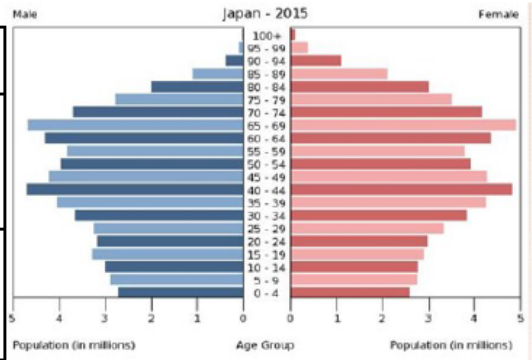
Advantages of rose diagrams	Disadvantages of rose diagrams
• Gives a good visual represention of the data • Shows trends in terms of direction and number/ volume	• They do not show the exact route taken • Care is needed when deciding upon a scale where there is a large range of values.

You can find other useful graphical skills resources on teach it - https://www.teachitgeography.co.uk/skills

Other Graph Techniques

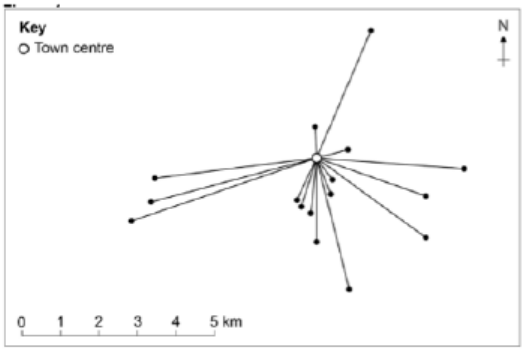
Population Pyramids

Advantages	Disadvantages
Clearly shows the population structure of a country.	Can be difficult to construct.
Gives accurate data.	

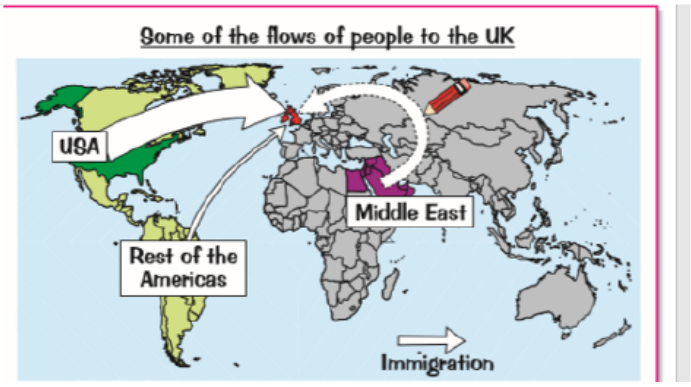


Desire Lines

Advantages	Disadvantages
Can show both volume and direction of movement.	Some simplification is needed e.g doesn't show if journeys deviate.
Can be put on to a map to show extra information.	If it isn't put on a map it doesn't help explain why the pattern occurs.



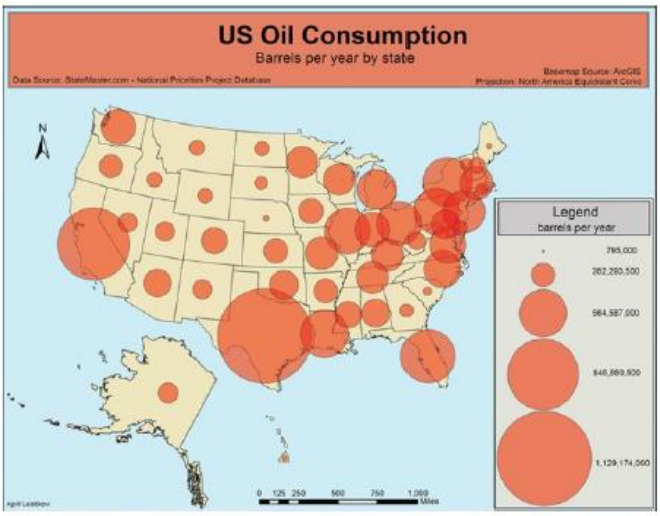
Flow Lines



Advantages	Disadvantages
Can show both volume and direction of movement.	Some simplification is needed e.g doesn't show if journeys deviate.
Visually effective.	Calculating actual values may be difficult.

Proportional Symbols

Advantages	Disadvantages
Easy to read as each symbol is proportional to it's value.	Takes a long time to construct.
Visually effective.	Calculating actual values may be difficult.

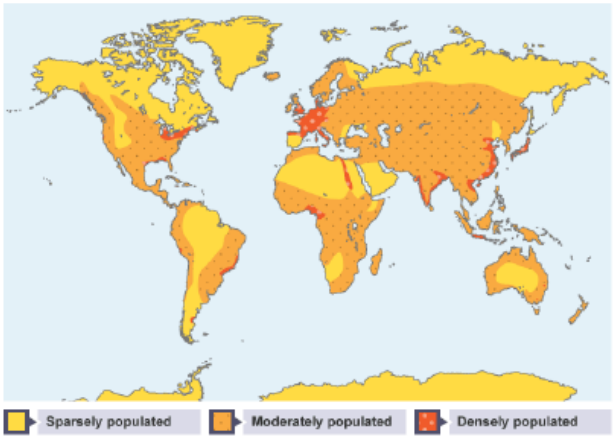


Mapping Data

Choropleth Maps

Advantages	Disadvantages
Choropleths give a good visual impression of change over space.	The grade boundaries you use can affect the pattern that it produces.
Choropleths allow easy comparisons in data between areas.	It can be difficult to tell the differences between different shades of colour.

Choropleth maps show **interval data** (data that is linked, rather than data from different categories) as colours. They are shaded in using one colour, where the darker shades represent high numbers and the lighter shades represent low numbers. A choropleth map needs a key to explain what the different shades mean.
Population density can be shown using a choropleth map.

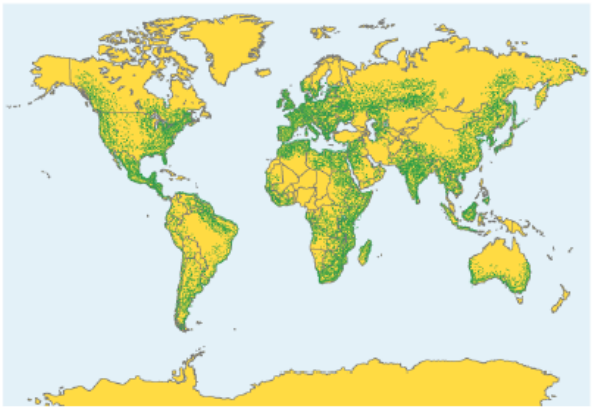


Dot Maps

Advantages	Disadvantages
Dots are located accurately on a map e.g. an accurate city location.	It can be difficult to find accurate Information.
The number and density of dots clearly shows the information on the map.	Its easy to under or over estimate the number of dots in an area and misjudge the pattern shown.

Dot maps

Dot maps show information as individual dots on a map. Each dot might represent more than one of something. Dot maps are often used to show **population distribution**.

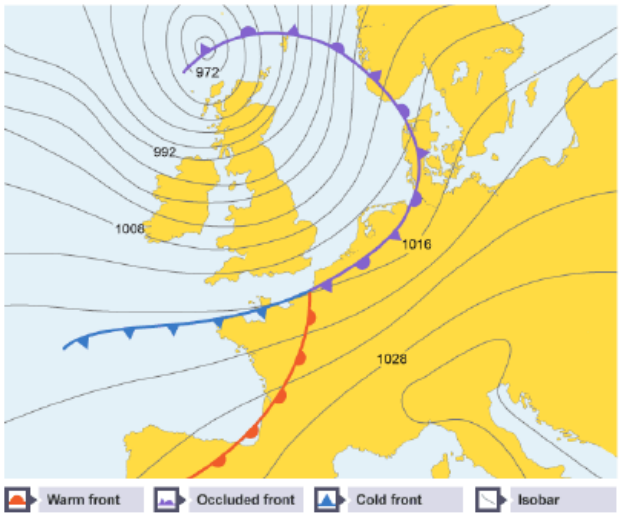


Isoline Maps

Advantages	Disadvantages
Patterns can easily be seen.	Needs a large amount of data from a large area to be accurate.
Shows gradual changes over a large area.	Hard to construct can be subjective.

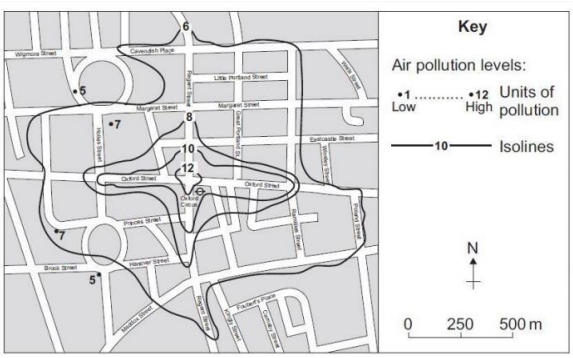
Isoline maps

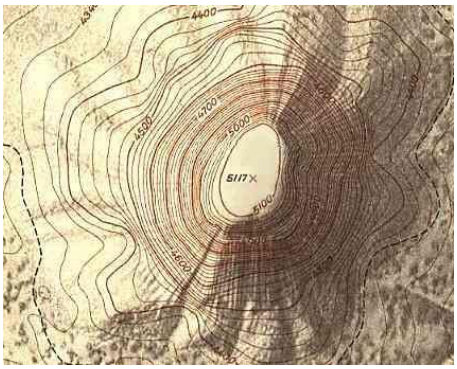
Isoline maps show lines that join up areas or values that are equal. **Atmospheric pressure** is shown using an isoline map. The areas of equal pressure are joined using a line, which helps people to see the position of high and low-pressure systems.

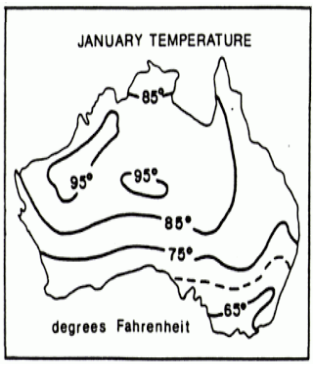


Isolines

Isolines are lines drawn to link different places that share a common value. The prefix 'iso' is a greek word meaning equal, so an isoline must be a line **joining equal points**.



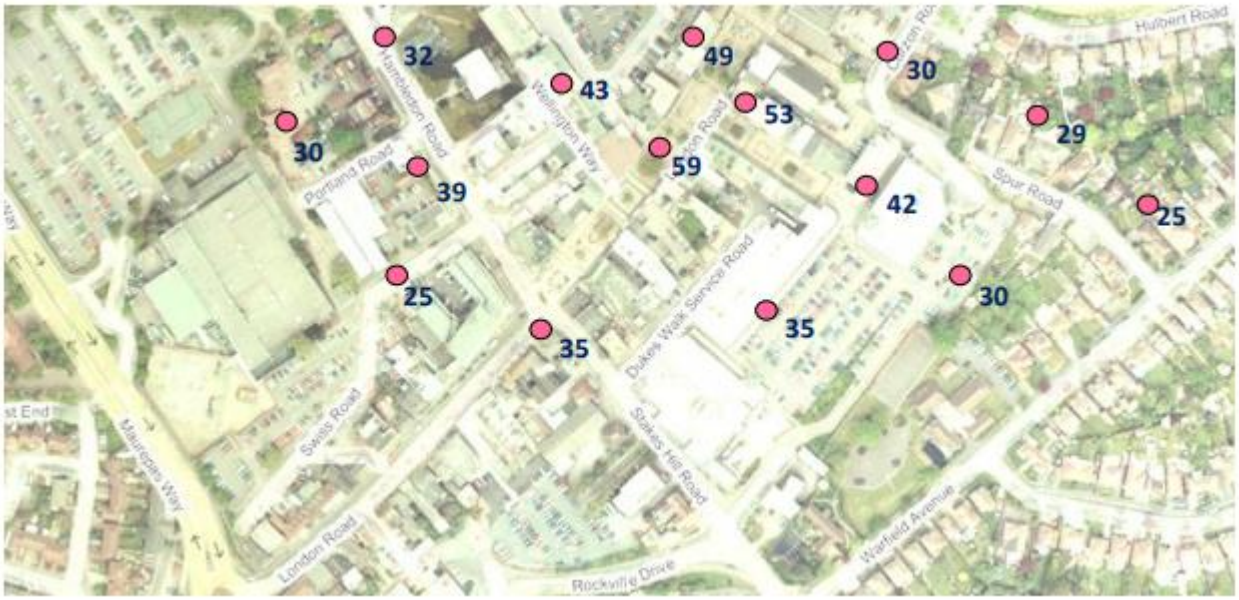




For example, a line drawn on a map to join up all the places that are the same height above sea level is called a contour. Contour lines are isolines joining places that have the same height value. Another common isoline is the isobar, a line that joins places with the same atmospheric pressure. These are often shown on weather maps in newspapers and TV weather forecasts.

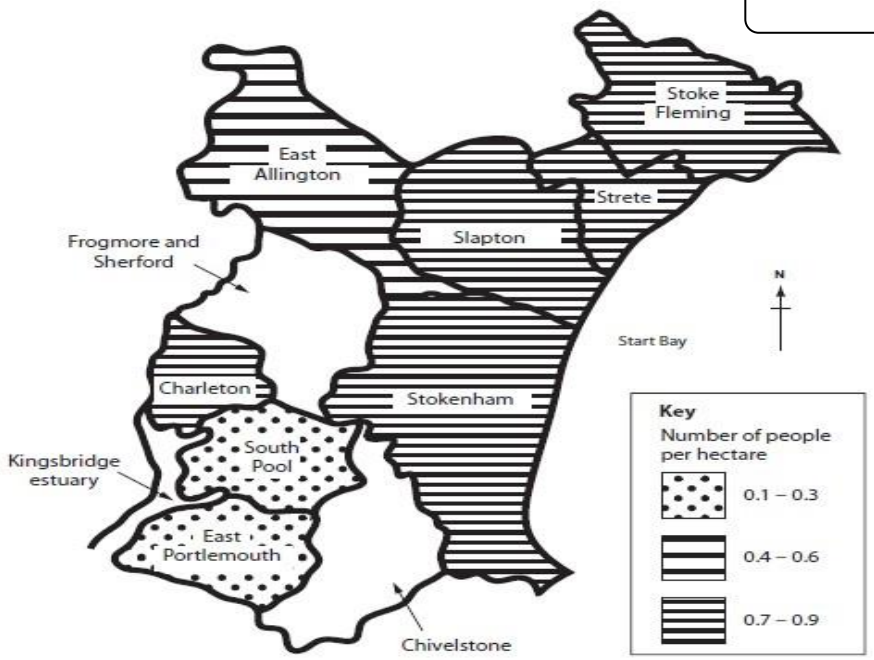
Geographers often use isolines to help them map the distribution of things. When isolines are combined with colouring or shading they make it possible to easily see data that would be hard, or impossible, to understand as a table or chart of numbers.

On the map below, create the isolines based on pedestrian count data around the CBD of Waterlooville using intervals of 10 (e.g. 10, 20, 30, 40 and so on). Remember it's not dot to dot.



Study Figure 16. It shows the population densities of some parishes in South Devon.

Figure 16



(i) Complete Figure16. Use the data in the table below.

Parish	Population density (number of people per hectare)
Frogmore and Sherford	0.4
Chivelstone	0.2

(ii) Describe the pattern of population density shown on Figure 16. Use population density data in your answer.

(iii) Figure 16 is a choropleth map. State **one** advantage and **one** disadvantage of using a choropleth map to display data.

Advantage:

Disadvantage:

Study Figure 17 It shows population data for Warkworth and England.

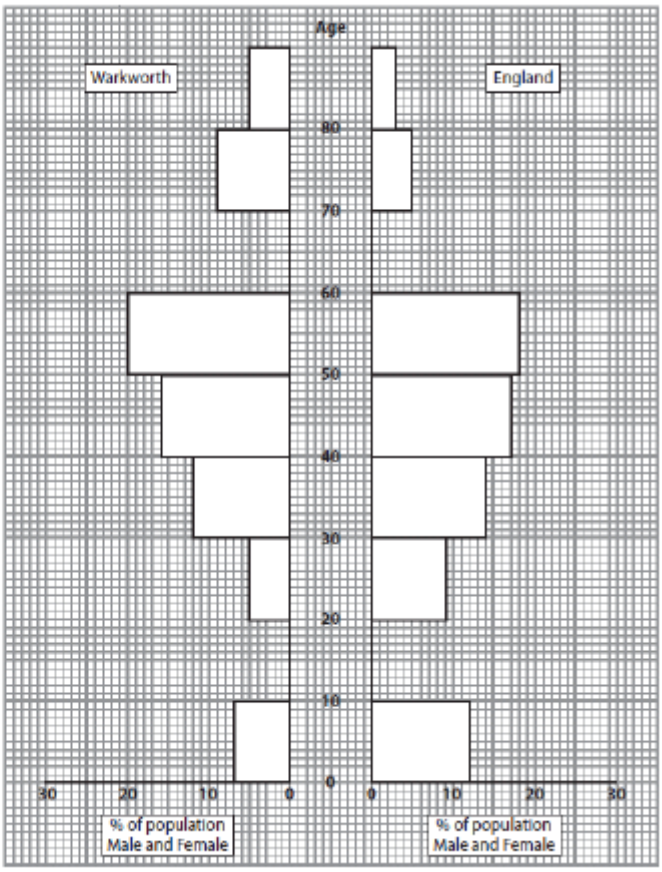


Figure 17

(i) Complete the population graph for Warkworth and England (Figure 17). Use the data in the table below.

Age	Warkworth	England
10–19	5	9
60–69	15	7

(ii) Comment on the age structure of Warkworth compared to England. Use population data in your answer.

Study Figure 5. It is an incomplete rose diagram showing some of the results of a questionnaire carried out in the car park in the Malvern Hills. The bars show the direction from which people had travelled to visit the Malvern Hills.

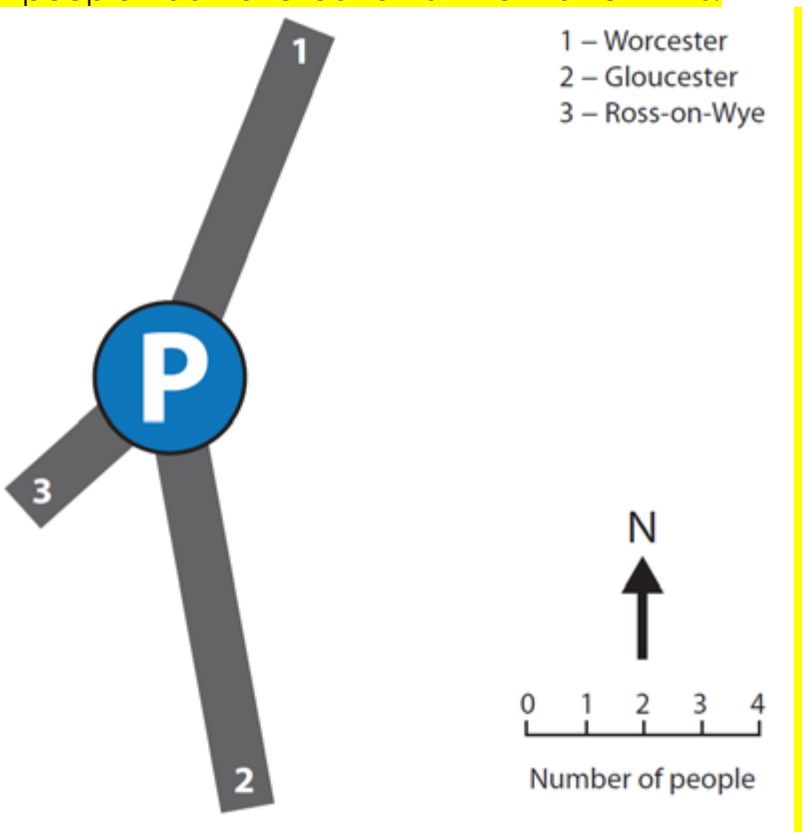


Figure 6 Rose Diagram of Survey Results

(i) In which direction would you travel from Ross-on-Wye to the car park?

(ii) Complete Figure 5 using the information below. Wellington Heath is to the west, whilst Upton upon Severn is to the East.

Where have you travelled from today?	Number of people
Wellington Heath (7140)	6
Upton upon Severn (8540)	3

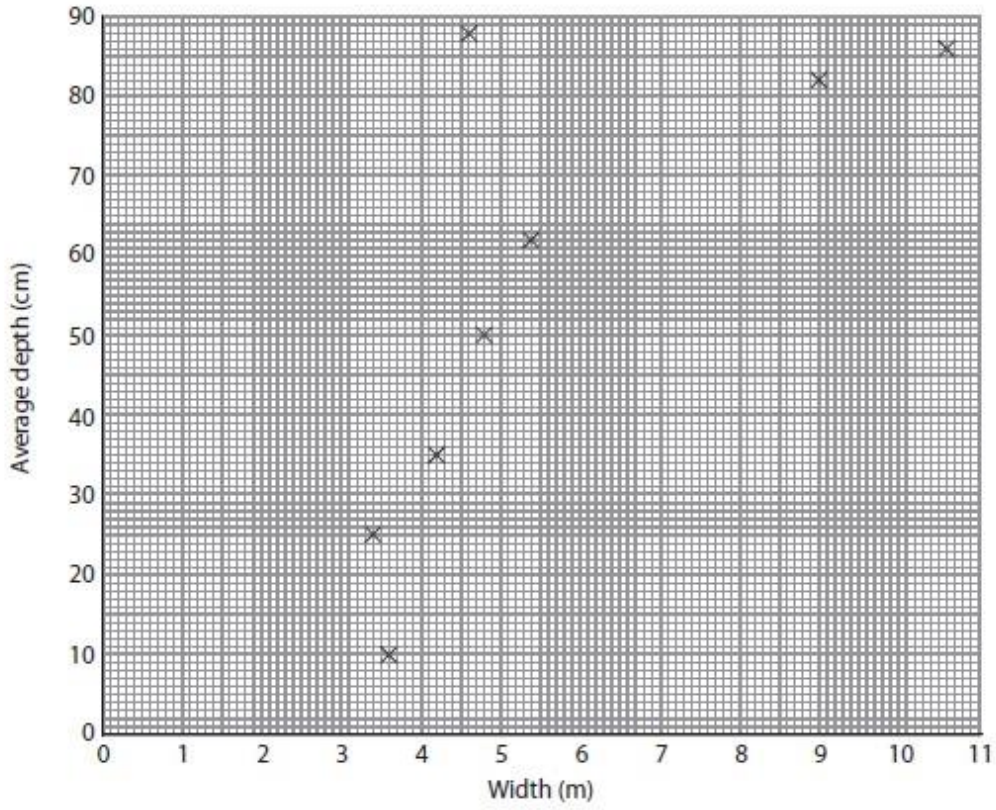
(iii) Suggest one reason why a rose diagram is the best way to present this type of data.

The figures in the table show river data collected by a field study group.

The figures are for 10 sites on the River Browney between Lanchester and Durham.

Site	Width (m)	Average depth (cm)
1	3.6	10
2	3.4	25
3	4.2	35
4	4.8	50
5	5.4	62

Site	Width (m)	Average depth (cm)
6	4.6	88
7	**5.8**	**70**
8	**7.0**	**75**
9	9.0	82
10	10.6	86



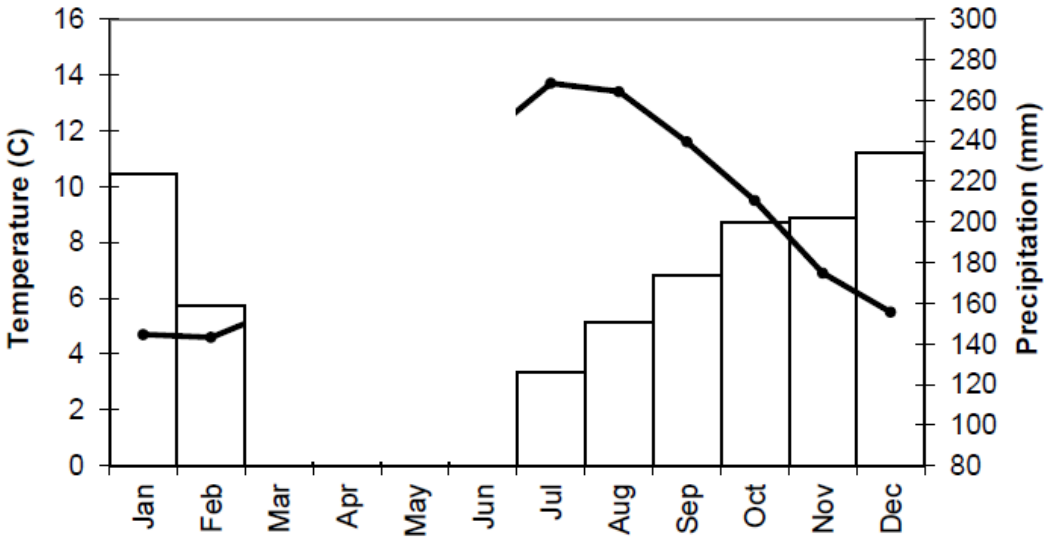
(i) Complete the scatter graph (Figure 18) for sites 7 and 8.

(ii) Describe how the width and depth of the River Browney change as it flows from site 1 to 10. Use data in your answer.

(iii) Give **one** reason why a scatter graph is a good way of displaying this type of data.

(i) Using the data in the table complete the climate graph below.

Month	Precipitation	Temperature
March	148	6
April	108	7
May	99	9.6
June	105	11.8



Section 4 Statistical Skills

	R	A	G
How to calculate the mean			
How to calculate the median			
How to calculate the mode			
How to calculate the range			
How to calculate quartiles and the inter-quartile range			

Mean
Add up all the data values in the data set and then divide that figure by the total number in the data set.

a) Calculate the mean annual discharge of the river with the following discharge figures (all in m³/second): 650, 467, 632, 711, 589, 494, 467 = _____
b) What is the mean population increase for these groups of countries (all per 1000 per year): 23, 11, 34, 26, 31, 8, 31, 24, 9 = _____

Mode
This is the most frequent number that occurs in the data set.
Using the data sets given in tasks a and b above, calculate the mode for each and record in the spaces below.

Space for workings

a) Mode of a = _____ b). Mode of b = _____

Median
The median is the middle value in a data set when the data has been arranged in rank order. To calculate the median is quite easy. If there is an odd number, the formula on the right can be used. For example, if there are 15 values, the formula would be (15+1)/2 = the 8th number in the sequence. If there is an even number of values in the data set, then the median is the average of the two middle values.

For example, look at the following two data sets:
2, 3, 3, 4, 5, 6 = There is an even number of values in this data set, so the median is the average of the middle two values (3+4)/2 = 3.5
7, 9, 10, 14, 16 = There is an odd number of values, so the median is the middle value = 10 (if you wanted to use the formula, (5+1)/2 = 3rd number in the data set, which is 10.

a) Calculate the median for this data set: 3, 22, 5, 32, 21, 2, 54, 34, 9, 42, 31, 24

Median: _____

b). Calculate the median for this data set: 459, 321, 632, 234, 127, 265, 205, 322, 284

Median: _____

Range
If you just take the mean, median and mode of data sets then all the results could be the same, but they do not give an indication of how the data set has been distributed. This is why geographers look at measuring the level of dispersion. The range is calculated by subtracting the lowest value from the highest value to find the difference in between.

a) Measure the range of this data set (and write your calculations too): 3, 22, 5, 32, 21, 2, 54, 34, 9, 42, 31, 24

Range:

b) Measure the range of this data set: 459, 321, 632, 234, 127, 265, 205, 322, 284

Range:

Interquartile range

The measurement of the interquartile range provides a more detailed look at the level of dispersion.

Essentially, interquartile range requires you to rank the data in order and then split the data into **4 equal groups/ quartiles**. The boundary between the first and second quartiles

is called the **'upper quartile'** and the boundary between the third and fourth quartiles is called the **'lower quartile'**.

To calculate the upper quartile (UQ) you use the formula: $\frac{(n+1)}{4}$

To calculate the lower quartile (LQ) you use the formula: $\frac{3(n+1)}{4}$

The interquartile range (IQR) is calculated as follows: **IQR = UQ – LQ**

This gives an indication of the spread of the middle 50% of data around the MEDIAN value, thus giving a better indication of the spread of data around the median when compared to just the simple range figure.

Calculate the IQR for the following data (clearly, rank them in order first, calculate the UQ figure and the LQ figure and then calculate the IQR):

23, 24, 12, 43, 25, 32, 27, 26, 13, 50, 42, 18, 33, 27, 46, 16, 33, 22

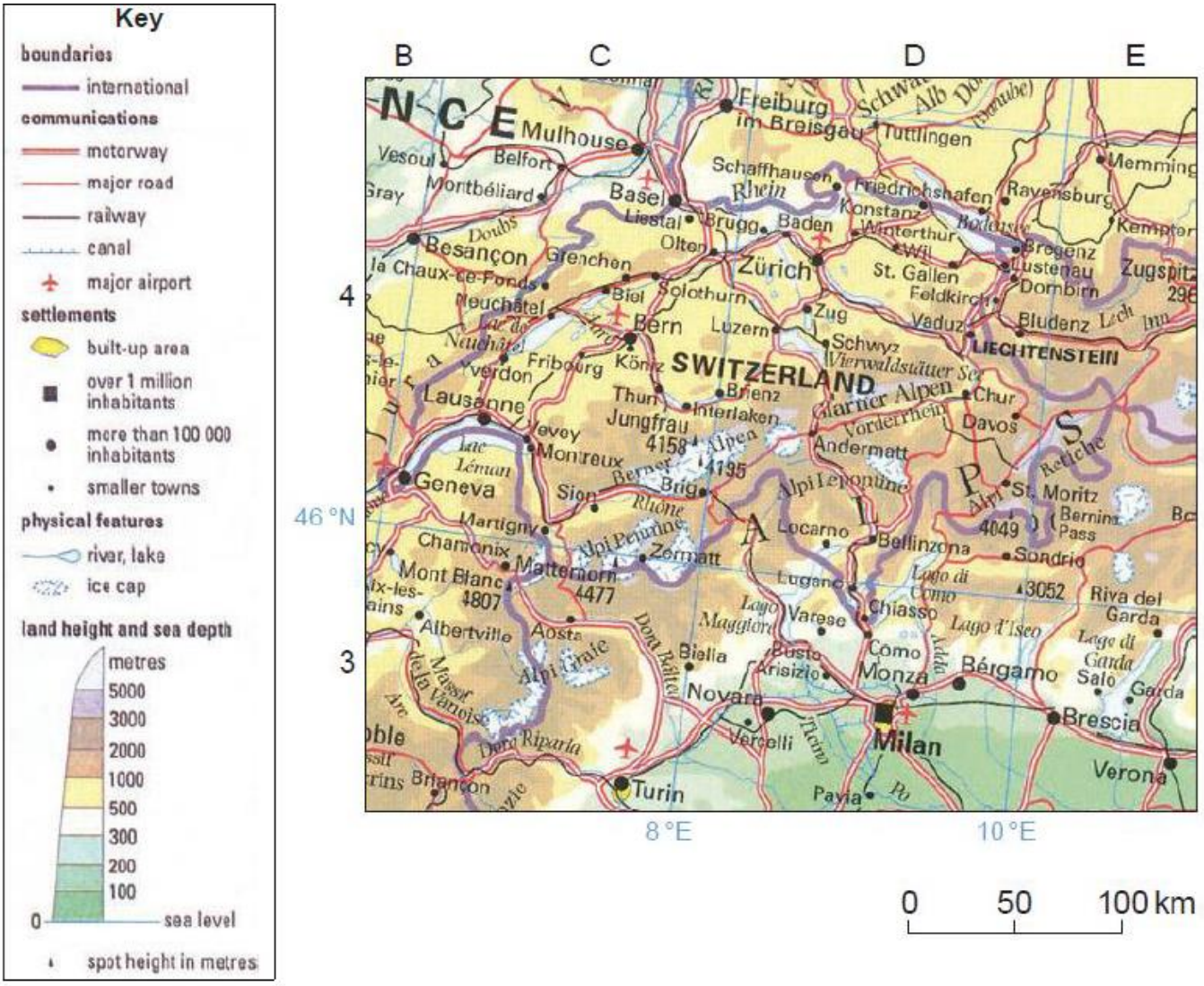
Space for workings:

UQ: _____ LQ: _____ IQR: _____

Calculate the IQR for the following data:

459, 321, 632, 234, 127, 265, 205, 322, 284, 321, 245, 545, 421, 224, 578, 311

Section 5 Practice



a) What is the name and height of the highest mountain on this map?

b) What is the distance from Milan to Turin?

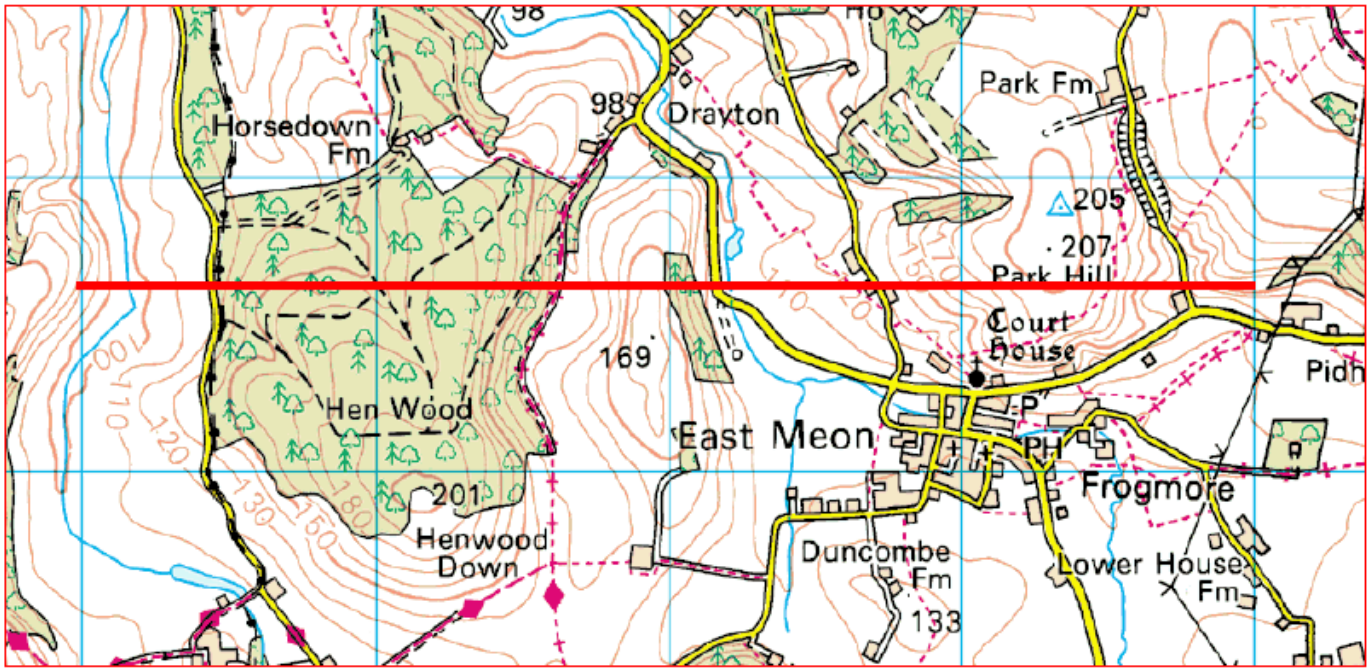
c) What is the distance from Milan to Basel?

d) How high above sea level is Zurich?

e) What mountain range is shown on this map?

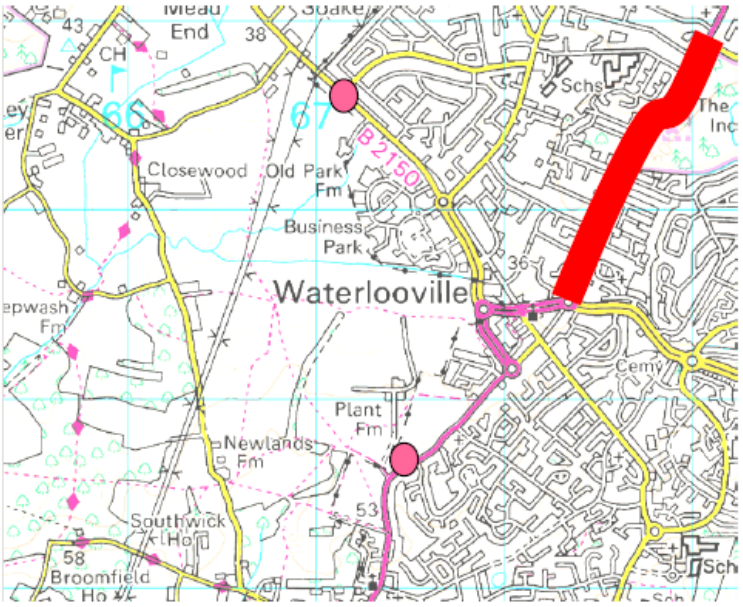
f) What is the height of Verona?

g) How high is Mont Blanc?



Create a cross-section of the transect above.

Flow Lines



Sometimes a simple pie chart or bar chart doesn't really tell the whole story. It is far better to actually place the data on to a map to provide the spatial dimension. That is what has been started here. A traffic count has taken place on the Denmead Road and also on the A3 (the pink dots). Using the scale for the width of the arrow of 1cm =10 cars add the following on to the graph:

	A3 Going NE	A3 Going SW
Traffic Count	15	20
	Denmead Road Going NW	Denmead Road Going SE
Traffic Count	32	14

Desire Lines

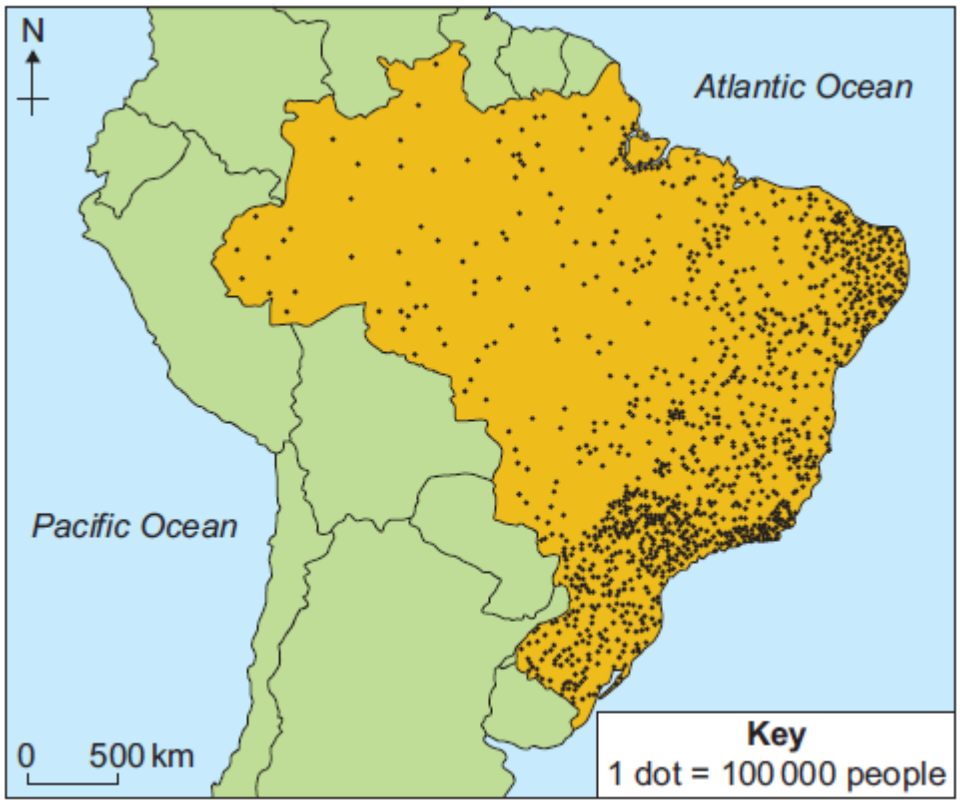
These are lines drawn directly from the point of origin to the final destination.

Produce a desire line map to show the origin of visitors to East Head Spit (the red dot) on the map below using the figures in the table.

County	Number
Norfolk	1
Berkshire	3
Kent	5
Wiltshire	6
Staffs	1
Shrops	1
Devon	1
Cornwall	1
Essex	2
Northants	1
West Sussex	20
Hampshire	12

Dot Maps

This is where the distribution of a geographical variable is plotted on a map using dots of equal size. Each dot has the same value and is plotted where that variable occurs. The value should be high enough to prevent overcrowding, but too large and some places will not reach the level required to gain a 'dot'!



Using the map:

a) Describe the population distribution of Brazil

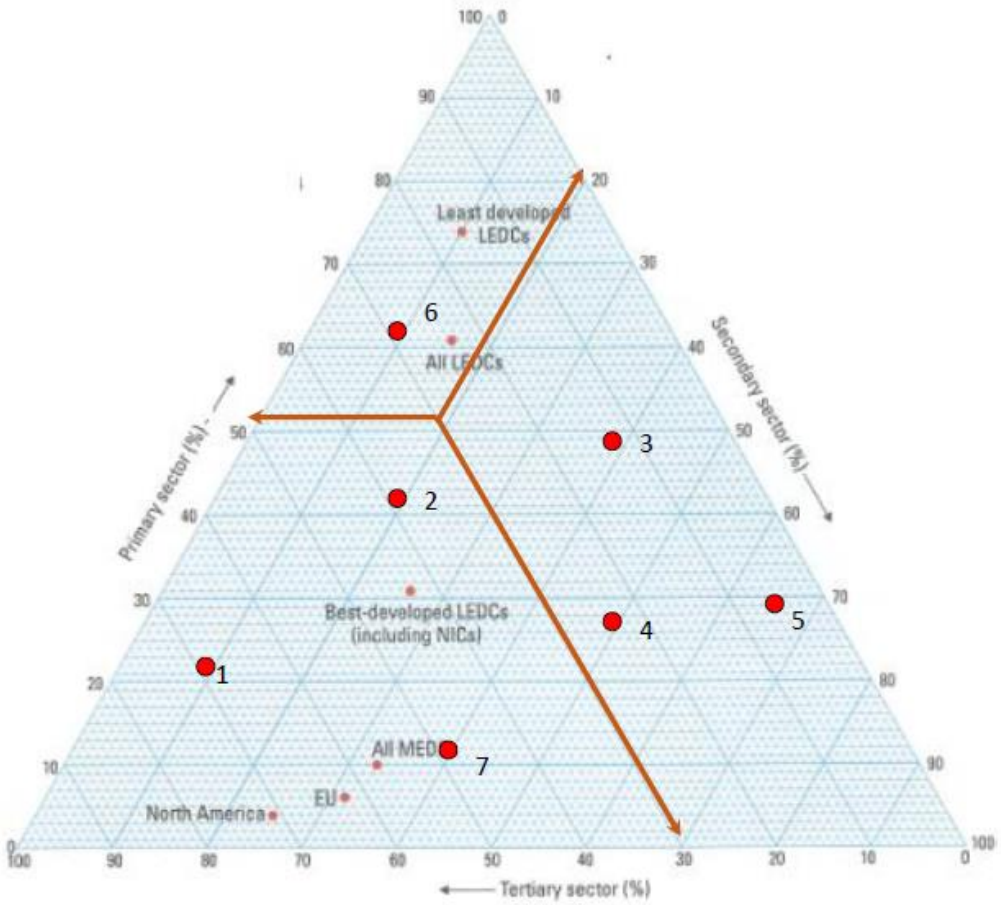
b) Outline one strength and two weaknesses of this method of data presentation
Strength:

Weakness:

Weakness:

Triangular Graphs

These are plotted on special graph paper in the form of an equilateral triangle. It can only be used for a whole figure that can be broken into 3 components. Once plotted clusters can emerge and classifications can also take place.



What are the primary, secondary and tertiary percentages for the following points:

1. P _____ S _____ T _____
2. P _____ S _____ T _____
3. P _____ S _____ T _____
4. P _____ S _____ T _____
5. P _____ S _____ T _____
6. P _____ S _____ T _____
7. P _____ S _____ T _____

Dispersion Graphs

The example shows the annual rainfall in two different locations over a 16 year period.

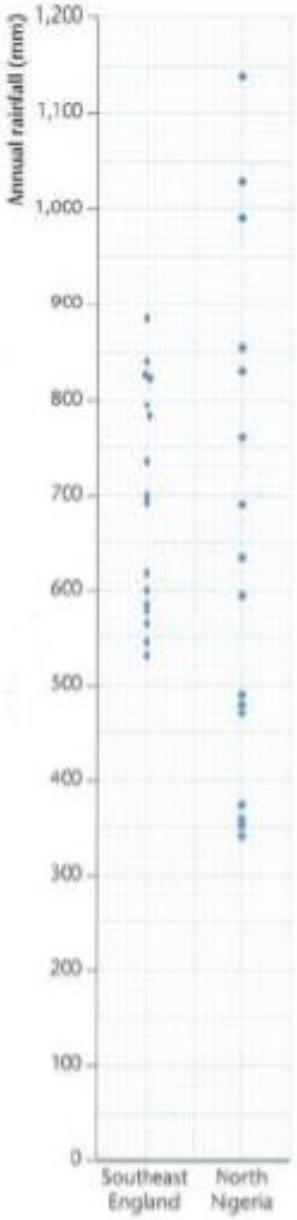
Each dot represents the total annual rainfall for a particular year:

1. What is the range of values for:
a) SE England _____
b) North Nigeria _____

2. What is the highest annual rainfall in SE England? _____

3. What is the highest annual rainfall in North Nigeria? _____

4. Compare the distribution of the data for the two locations.

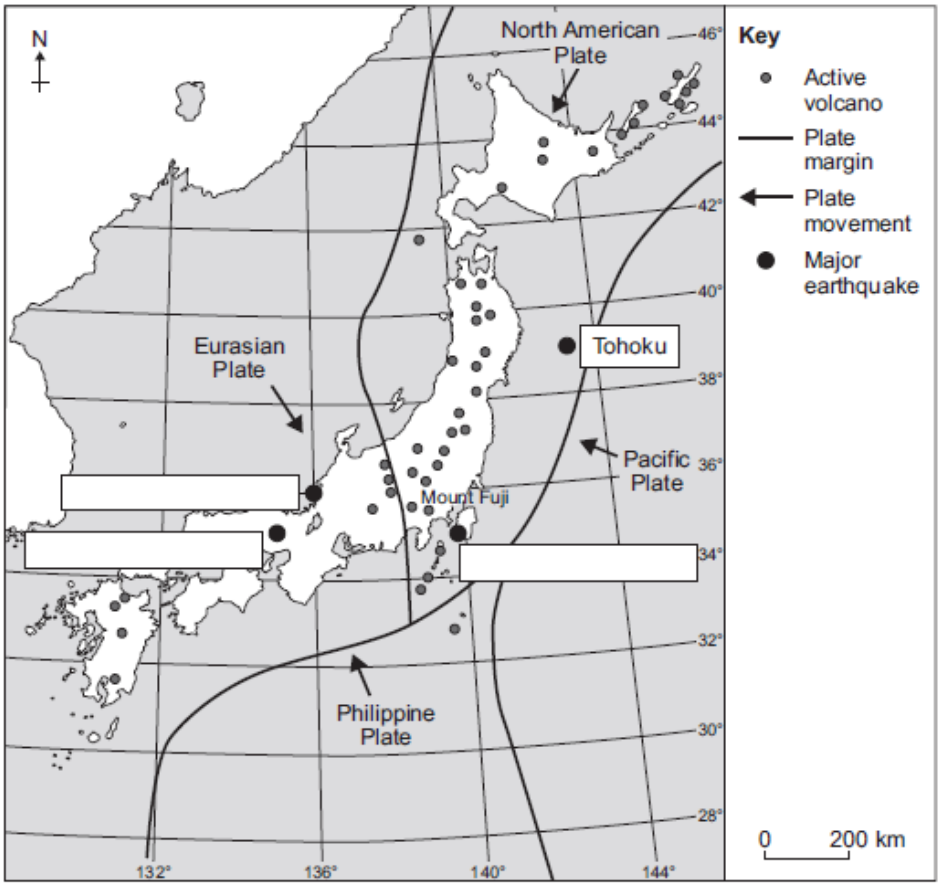


Section 6 Exam Questions

IGCSE 2016 Paper 3

2 Study **Figure 2**, a map showing information about earthquake and volcanic activity in Japan.

Figure 2



2 (a) Complete the labels on **Figure 2** which identify four major earthquakes that have affected Japan. One has been done for you.

Use the information below.

[2 marks]

Date	Earthquake	Latitude (approximate)	Longitude (approximate)
1923	Kanto	35 °N	139 °E
1948	Fukui	36 °N	136 °E
1995	Kobe	35 °N	135 °E
2011	Tohoku	39 °N	143 °E

2 (b) Using **Figure 2**, complete the following sentences.

Circle the correct answers.

[2 marks]

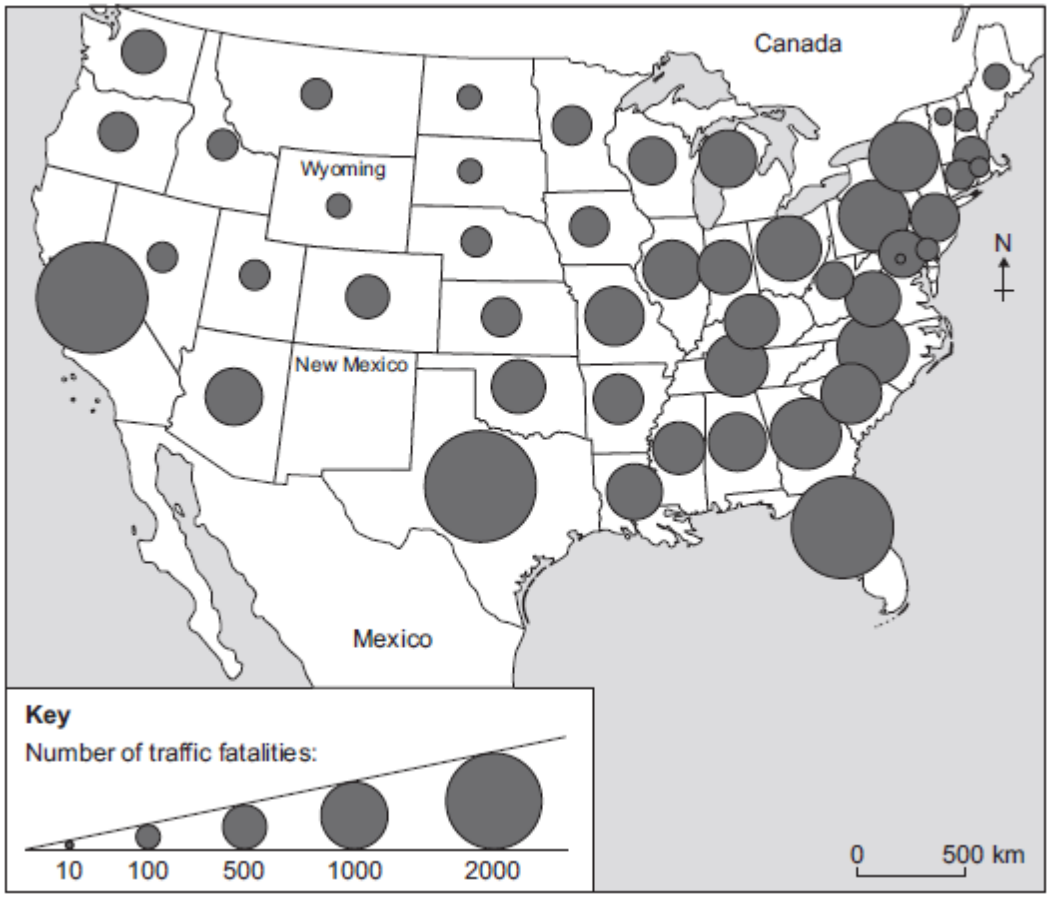
The Eurasian Plate and Philippine Plate are

[moving towards each other / moving apart / not moving].

Mount Fuji is on the **[Philippine Plate / North American Plate / Pacific Plate].**

3 Study **Figure 3**, a map showing traffic fatalities in the USA (by state) in 2009.

Figure 3



3 (a) Name the type of map used to show the data in **Figure 3**.

[1 mark]

_____

3 (b) How many traffic fatalities were there in the state of Wyoming in 2009?

[1 mark]

Circle the correct answer.

52 **103** **187** **248** **503**

3 (c) There were 423 traffic fatalities in the state of New Mexico in 2009.

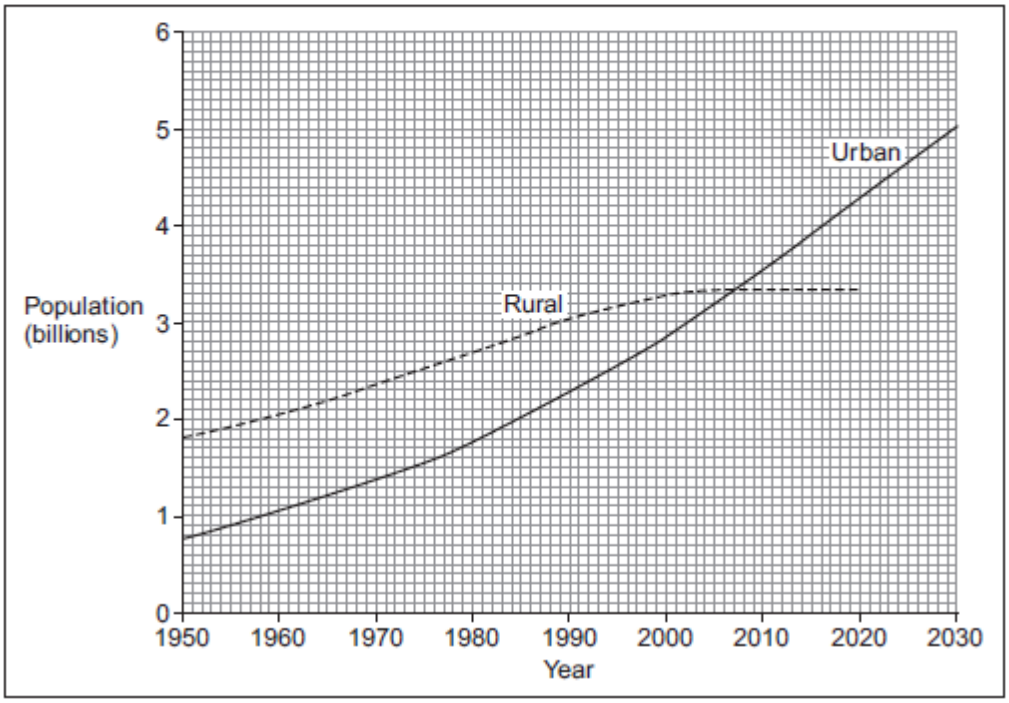
Which of the following is the correct symbol to show 423 traffic fatalities on **Figure 3**?

[1 mark]

Circle the correct answer.

4 Study **Figure 4**, a graph showing world urban and rural population between 1950 and 2030 (2010–2030 estimated).

Figure 4



4 (a) Complete **Figure 4**. Use the following information.

Rural population 2030 (estimated) 3.1 billion

[1 mark]

4 (b) Approximately how many more people lived in rural areas than urban areas in 1965?

[1 mark]

Circle the correct answer.

0.5 billion **1 billion** **1.5 billion** **2 billion** **2.5 billion**

4 (c) In which year did rural population and urban population have the same number of people?

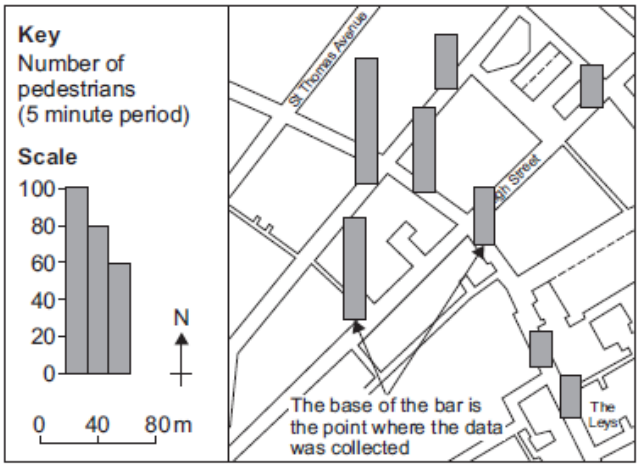
[1 mark]

_____

2 Study **Figure 2**, maps showing how students presented some of their data from a town centre investigation.

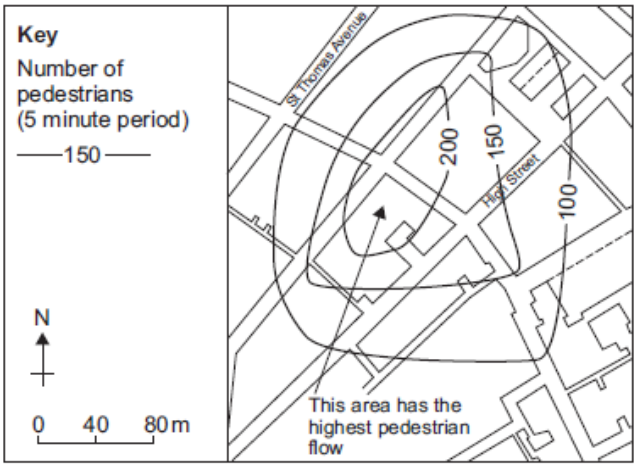
Figure 2

Map A



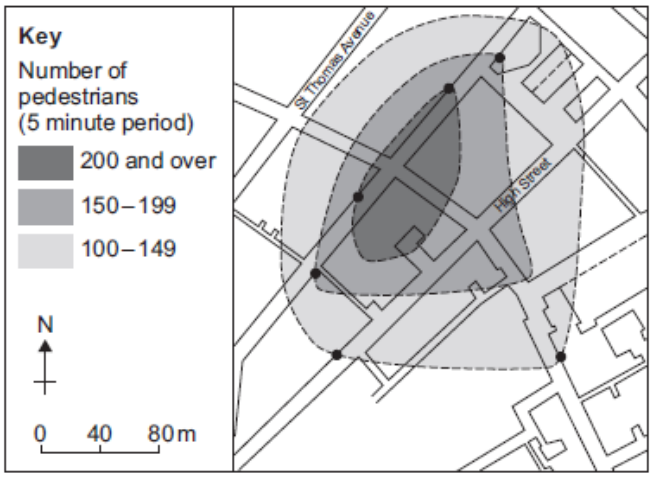
Pedestrian count (9.20 am)

Map B



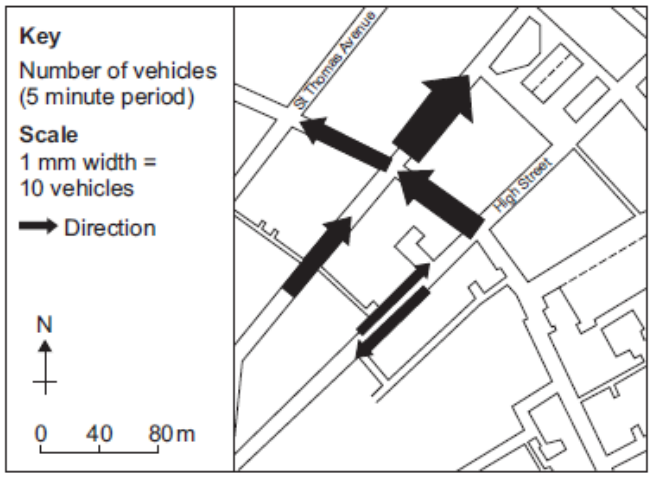
Pedestrian count (2.20 pm)

Map C



Pedestrian count (2.20 pm)

Map D



Traffic count (11.40 am)

2 (a) (i) Give the presentation technique used on each map shown in **Figure 2**.

[4 marks]

Map A .....

Map B .....

Map C .....

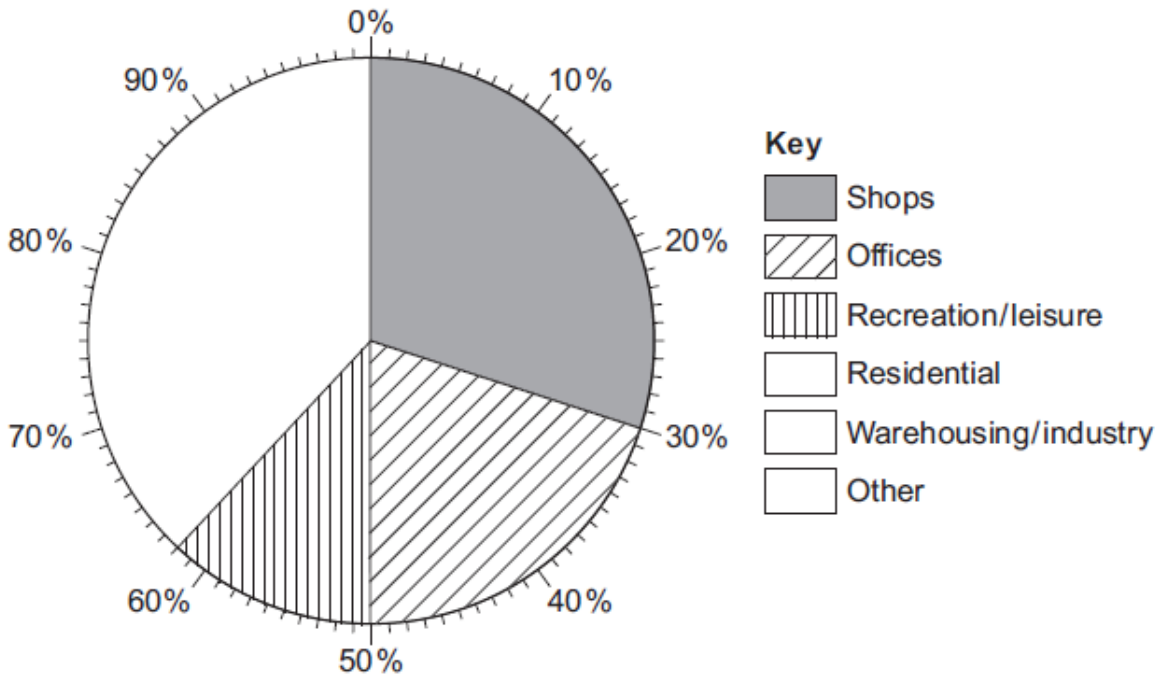
Map D .....

2 (a) (ii) Complete the following diagram and key showing the results of a land use survey carried out by the students in the town centre.

Use the following data.

[3 marks]

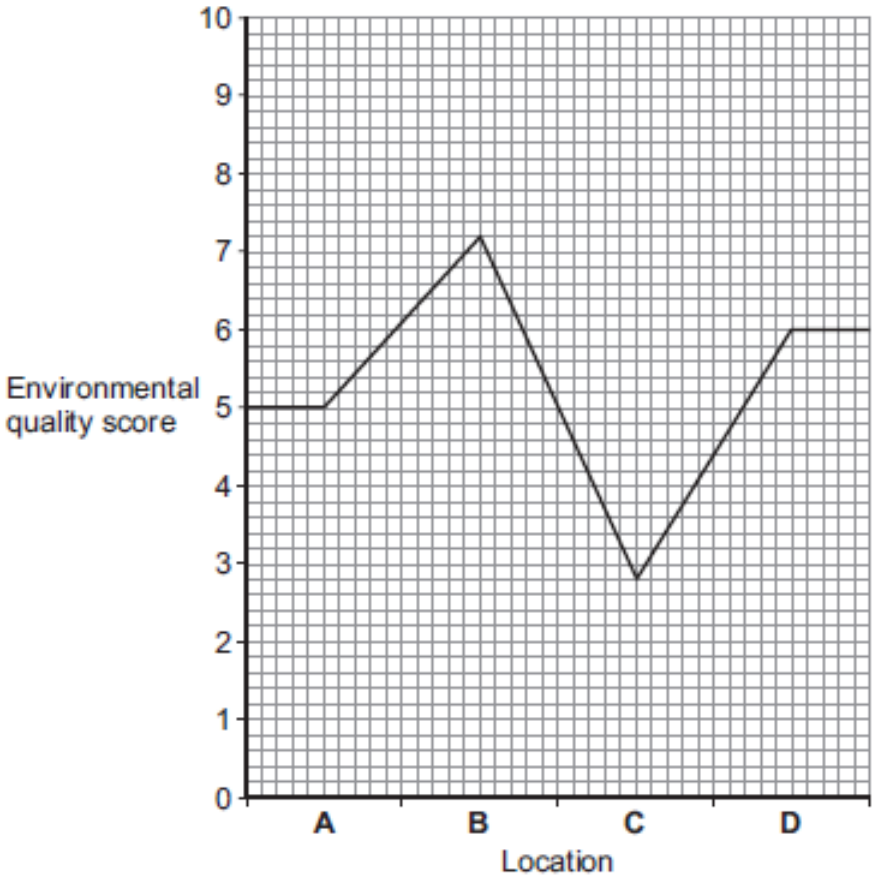
Residential – 12% **Warehousing/industry – 10%** **Other – 16%**



2 (a) (iii) One student carried out an environmental quality survey at four locations in the town centre. The four locations were each judged on a scale of 0 (poor) to 10 (excellent).

The following diagram (**Figure 3**) shows how the student presented the results of the environmental quality survey.

Figure 3



Suggest why this diagram is not an appropriate way to present this data.

[2 marks]

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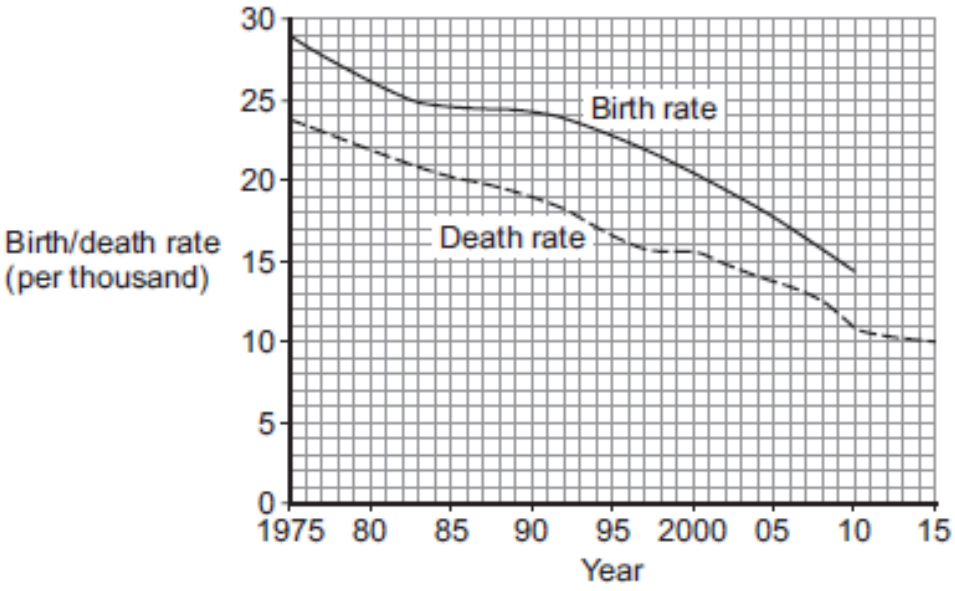
3 Study **Figure 4**, information about population change.

Figure 4

Population change

The birth rate is the number of births per thousand of the population (per year) and the death rate is the number of deaths per thousand of the population (per year). The natural population increase is when the birth rate is greater than the death rate.

Example of population change:



3 (a) (i) Use the following information to complete the graph in **Figure 4**.

[1 mark]

Year	Birth rate (per 1000)
2015	11

3 (a) (ii) Shade in the area on the graph in **Figure 4** which shows the natural population increase.

[1 mark]

3 (a) (iii) Using **Figure 4**, suggest **two** reasons why the death rate fell between 1975 and 2015.

[2 marks]

1 .....

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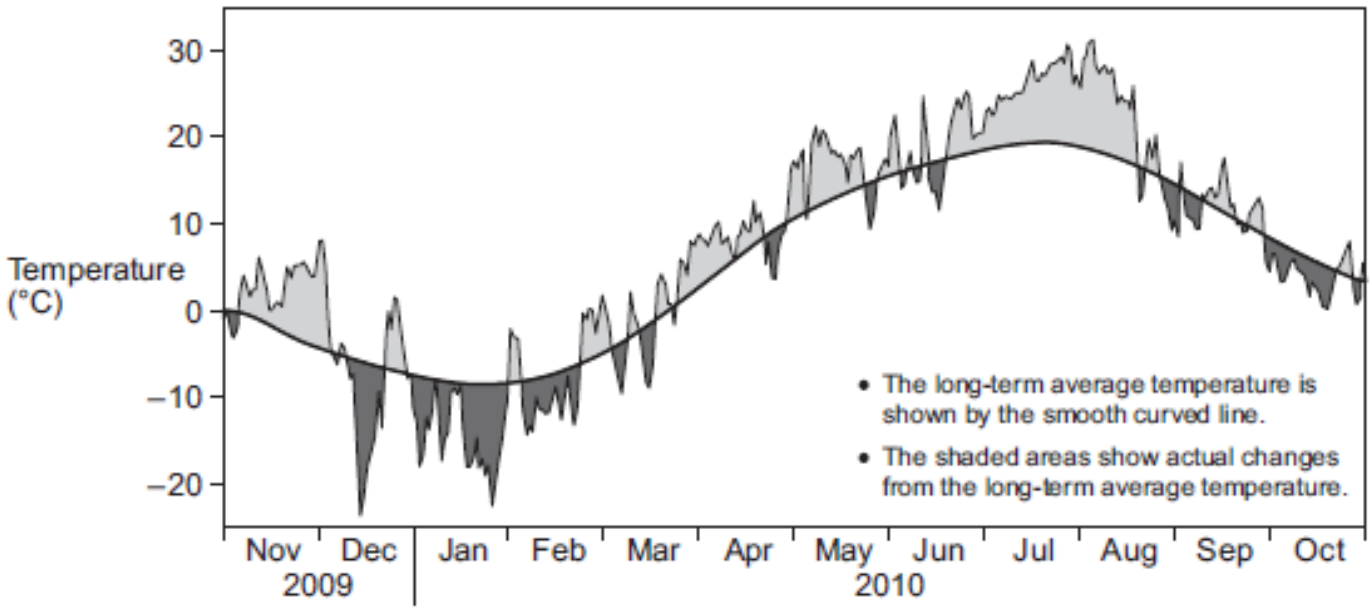
2 .....

.....

4 Study **Figure 5** which shows the average daily temperature over a 12-month period in Moscow.

Figure 5



4 (a) (i) Describe the pattern of long-term average temperature in Moscow between November 2009 and October 2010 shown in **Figure 5**.

[3 marks]

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4 (a) (ii) Identify **one** month in **Figure 5** where:

[2 marks]

temperatures were always below the long-term average.

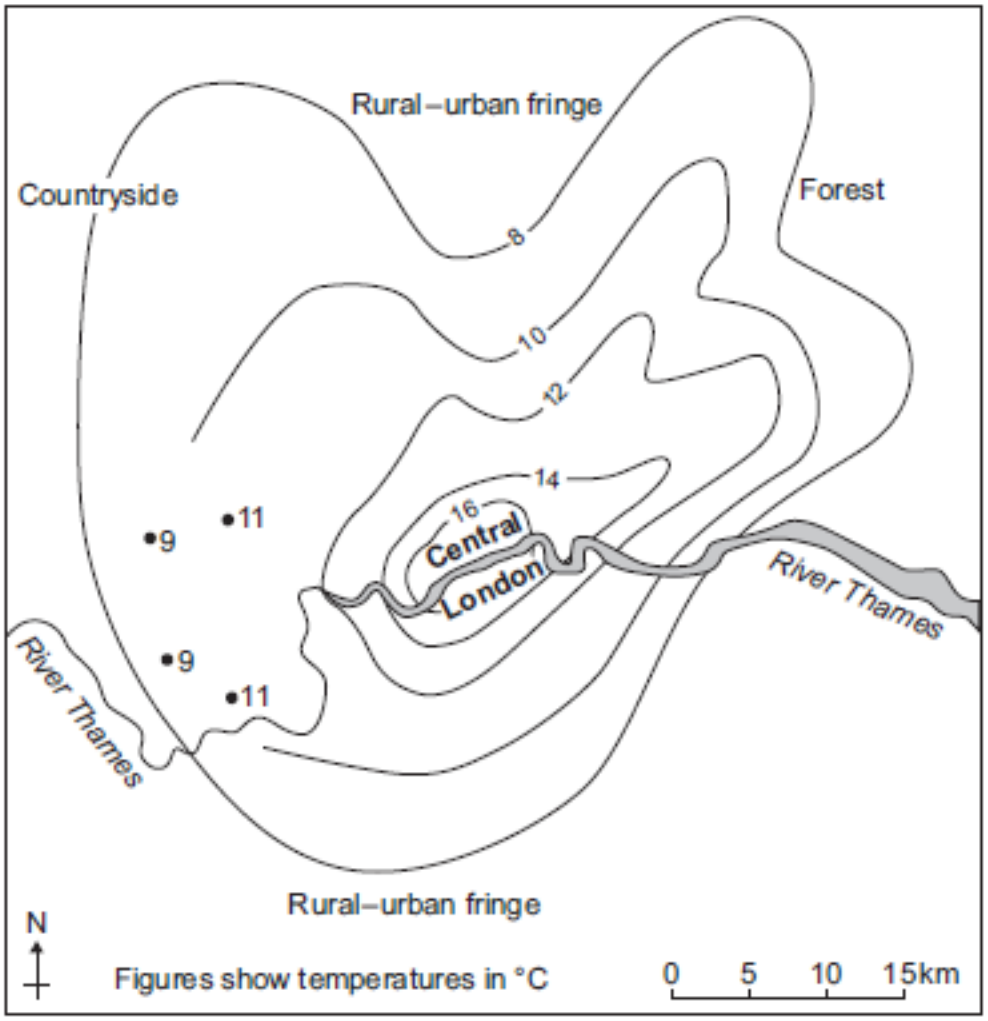
.....

temperatures were always above the long-term average.

.....

4 Study **Figure 4**, a map showing the pattern of average temperature (°C) during one July day in the London area.

Figure 4



4 (a) Complete **Figure 4** by plotting the remainder of the 10 °C temperature line.

[1 mark]

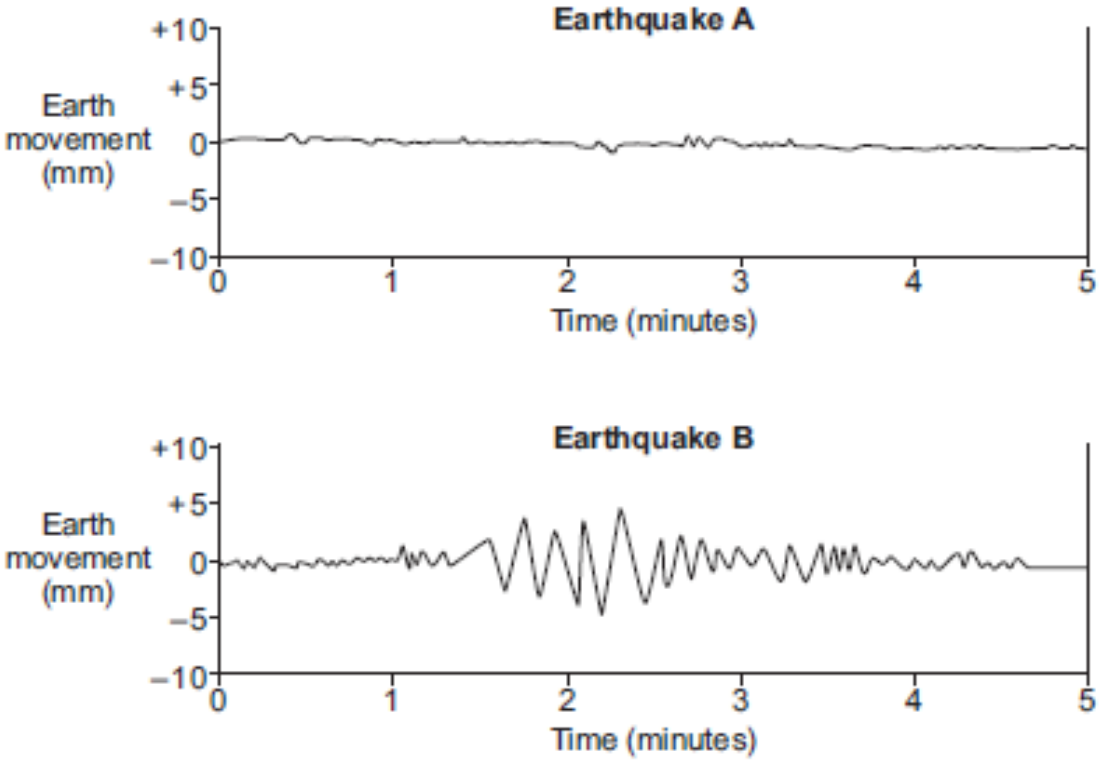
4 (b) What is the name of the type of map shown in **Figure 4**?
Tick the correct box.

[1 mark]

Dot map	
Isoline map	
Desire line map	

5 Study **Figure 5**, graphs showing earth movements experienced in two areas of earthquake activity.

Figure 5



Using **Figure 5**, compare the earth movements caused by **Earthquake A** with those caused by **Earthquake B**.

[4 marks]

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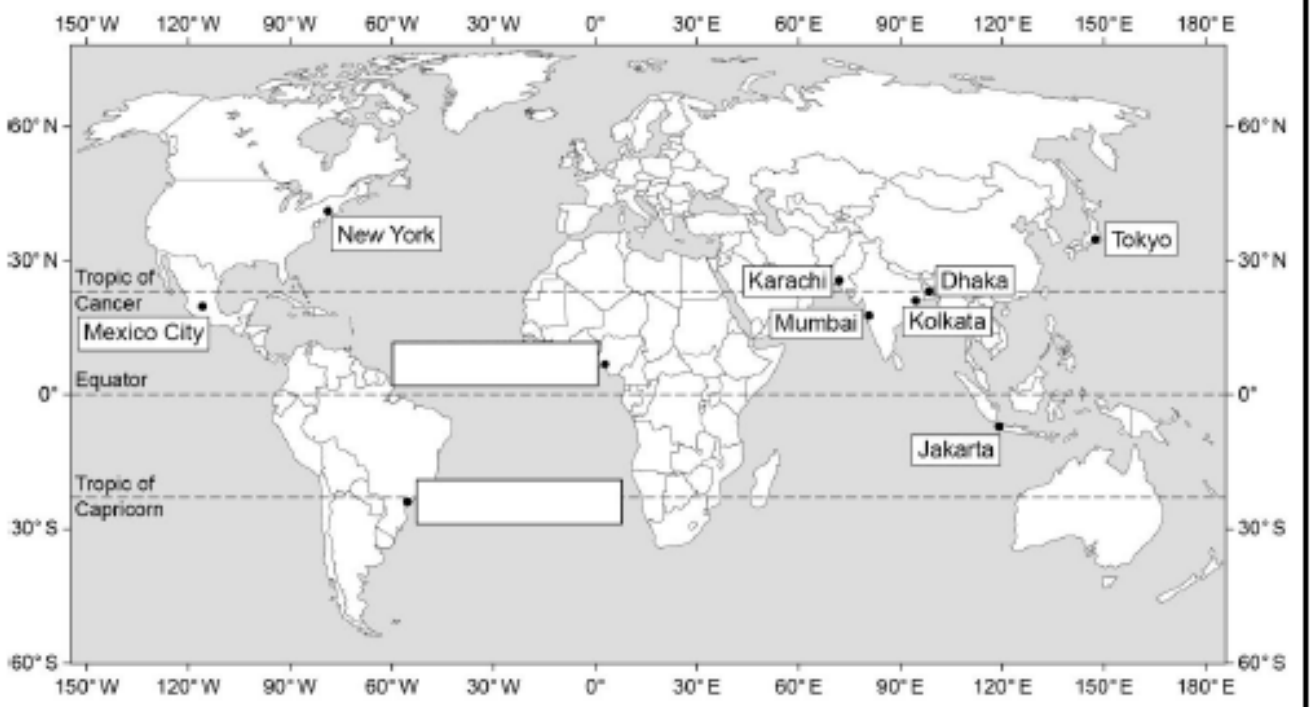
Sample Paper 3 Set 1

Question 1 **Issue evaluation**

Study **Figure 1**, a map showing the location of ten of the world's top ten megacities (2014).

Figure 1



0 1 . 1 On **Figure 1**, add the names of the **two** megacities to the correct boxes.

Use the information in the table below.

[1 mark]

Megacity	Latitude	Longitude
Lagos	6 °N	3 °E
São Paulo	24 °S	46 °W

0 1 . 2 Which **one** of the following is the correct latitude and longitude for Jakarta?

Shade **one** circle only.

A 21 °N 52 °E ⬭

B 30 °S 157 °E ⬭

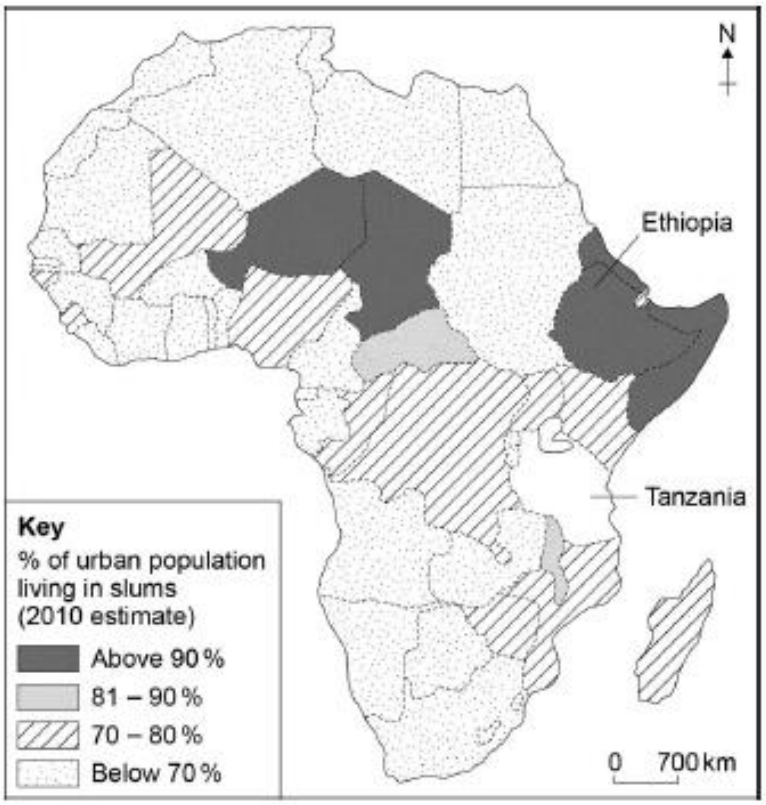
C 6 °S 106 °E ⬭

D 33 °N 75 °E ⬭

[1 mark]

Study **Figure 3**, a choropleth map showing the percentage of the urban population living in slums in African countries (2010 estimate).

Figure 3



0 2 . 1 Complete **Figure 3** using the information below.

[1 mark]

Estimated percentage (%) of urban population living in slums:

Tanzania – 80%

0 2 . 2 What is the estimated percentage of urban population living in slums in Ethiopia?

Shade **one** circle only.

A Above 90% ○

B 81–90% ○

C 70–80% ○

D Below 70% ○

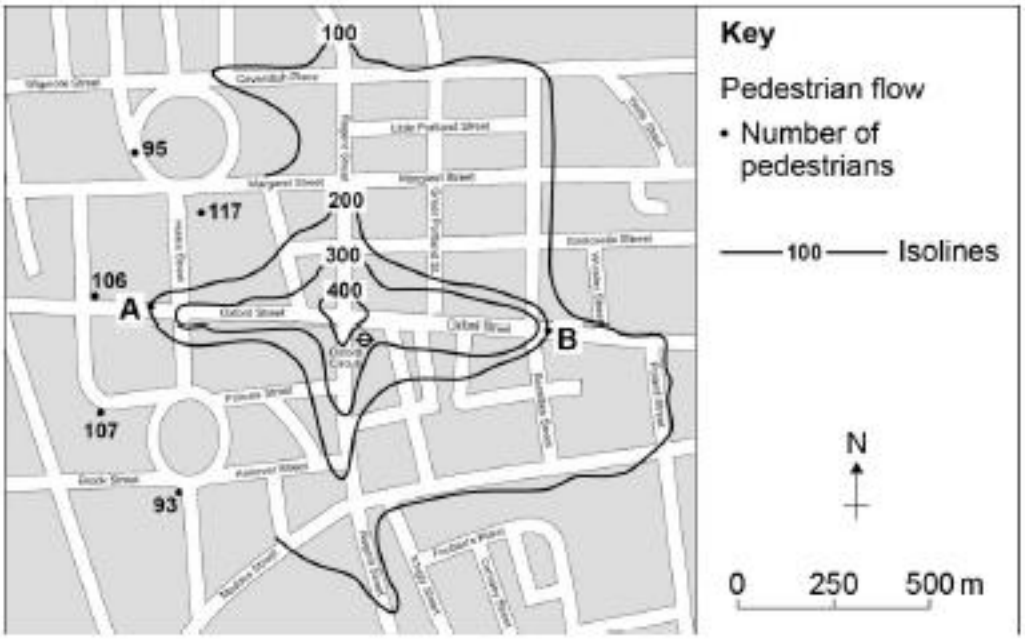
[1 mark]

0 2 . 3 In how many countries shown in **Figure 3** is it estimated that between 81–90% of the urban population live in slums?

[1 mark]

Figure 8 is an isoline map of pedestrian flow in part of London using results from a 5 minute pedestrian count.

Figure 8



0 4 . 2 Complete the isoline for 100 pedestrians shown on Figure 8.

[1 mark]

As part of an enquiry collecting primary physical geography data, a student measured pebble sizes at one location on a beach.

The results are shown in **Figure 9**.

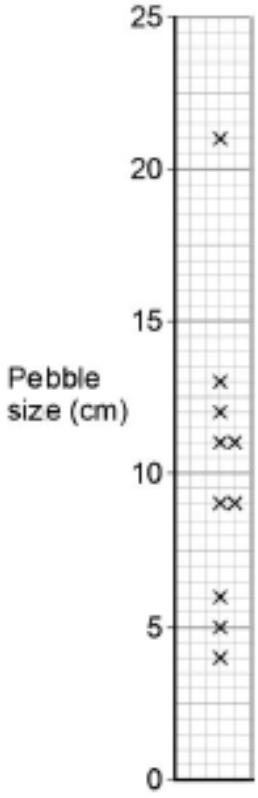
Figure 9

Pebble size is measured along the long axis.

Sample	Pebble size in centimetres
1	12
2	5
3	7
4	9
5	4
6	11
7	9
8	11
9	6
10	13
11	21

0 4 . 6 Complete the dispersion graph below using the data for Sample 3 in **Figure 9**.

[1 mark]



0 4 . 7 Suggest **one** way in which the data collection technique in **Figure 9** could be adapted to make the sample more reliable.

[1 mark]

0 4 . 8 Using the data in **Figure 9**, calculate the interquartile range of the pebble size data.

Show your working in the space below.

[2 marks]

Interquartile range = cm

0 4 . 9 Describe the pebble size data shown on the dispersion graph in **Question 04.6.**

[4 marks]

0 4 . 3 Study **Figure 5**, two sets of data collected by students who were carrying out a geographical enquiry about traffic problems in a town centre.

Figure 5

Car ownership in the town	
Date	**Number of Cars**
1950	3127
1960	4240
1970	4912
1980	5727
1990	6520
2000	7983
2010	8920

How people travelled to the town centre (sample of 100 people)	
Car	62
Walk	17
Bus	15
Motorcycle	3
Cycle	3

The following four methods were considered for presenting the data shown in **Figure 5**.

A Pie chart
B Line graph
C Proportional symbol map
D Flow line map

Which method (A, B, C or D) would be most suitable for presenting each set of data?

[2 marks]

Data shown in Figure 5	Presentation method
Car ownership in the town	
How people travelled to the town centre	

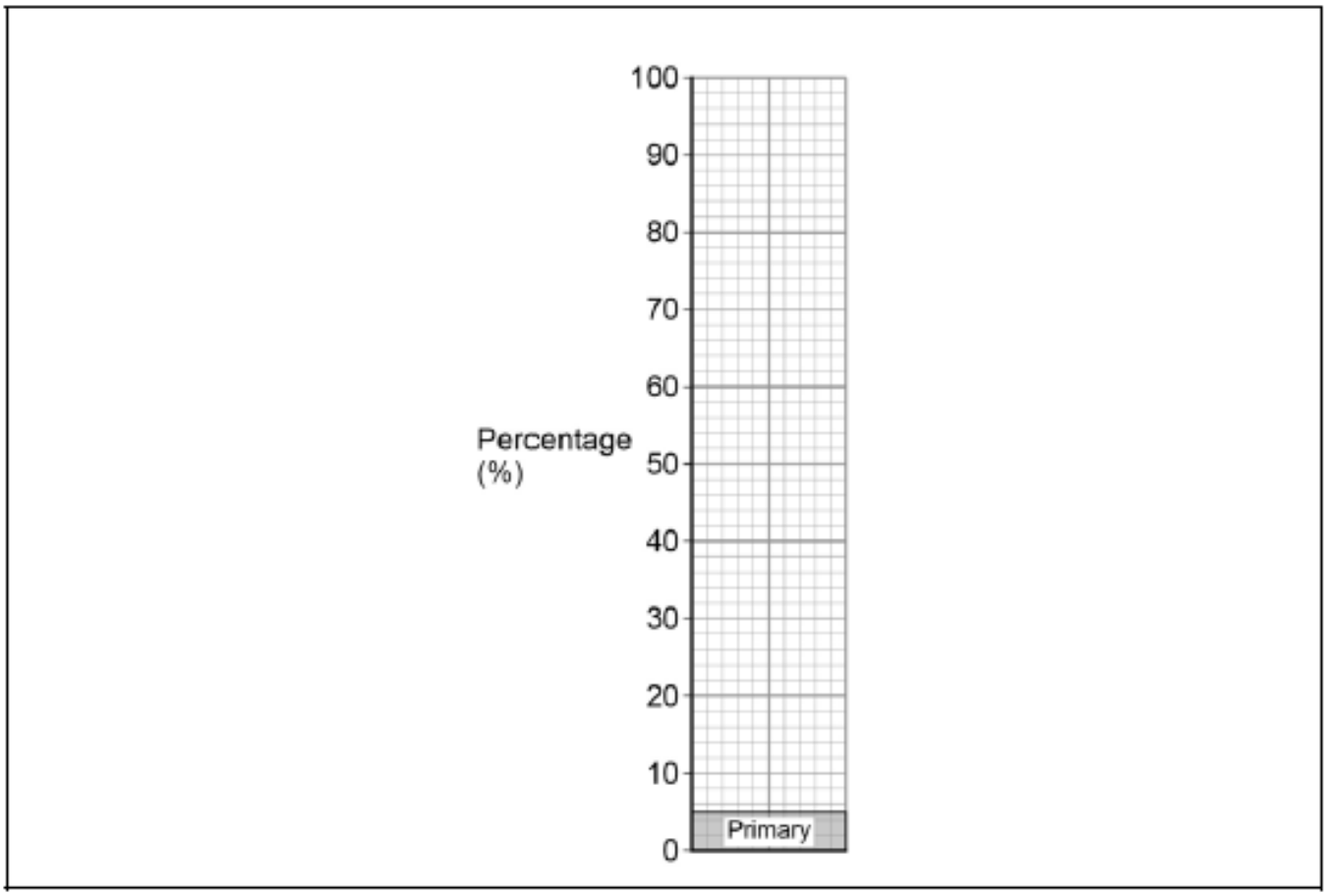
Study **Figure 7**, data collected by means of a questionnaire about the employment structure of a town.

Figure 7

Primary (%)	5
Secondary (%)	25
Tertiary (%)	70

0 4 . 5 Complete the divided bar graph below by plotting the data shown in **Figure 7**.

[1 mark]



0 4 . 6 Suggest **one** other method that could be used to present the employment structure data.

[1 mark]

Study **Figure 8**, data collected for a river enquiry.

Figure 8

River enquiry, April 2015

Stream flow

Date of the month	Flow (cumecs, approx.)
4	4
5	4
6	5
7	3
8	7
9	9
10	6
11	5
12	4
13	4
14	3
15	5
16	6

Cumecs = cubic metres per second

0 4 . 7 Complete the following table by using the stream flow data in **Figure 8**.

[2 marks]

Stream flow	Mean	5.0
	Median	
	Mode	

0 4 . 8 Suggest **two** pieces of advice that should be given to students in order to reduce potential risks when carrying out a physical geography enquiry.

[2 marks]

1: _____

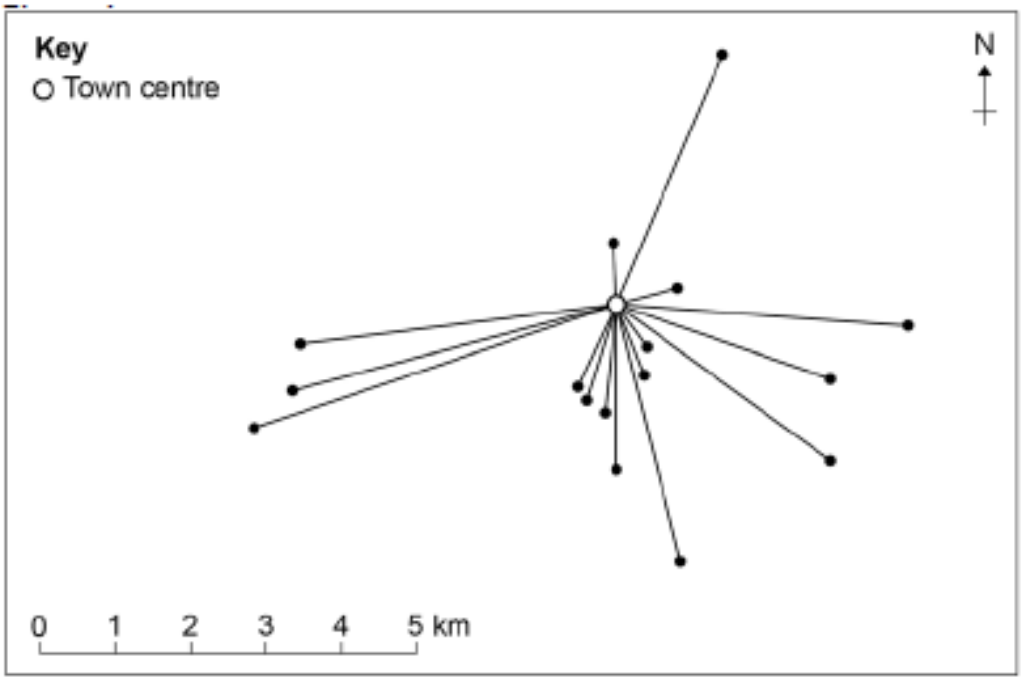
_____

2: _____

_____

0 4 **Fieldwork**

Study **Figure 4**, a map showing the movement of individual people from their homes to a town centre.



0 4 . 1 Name the type of map used in **Figure 4**.

Shade **one** circle only.

[1 mark]

A Proportional symbol ⬭

B Flow line ⬭

C Desire line ⬭

D Choropleth ⬭

0 4 . 2 Plot the following information on **Figure 4**.

A person travelled 2.5 km from the south-west.

[2 marks]

0 4 . 3 Describe the pattern shown on **Figure 4**.

[2 marks]

0 4 . 4 Suggest **two** additional pieces of information that could be added to **Figure 4** to explain the pattern of movement.

[2 marks]

1

2

Study **Figure 5**, a table used by students to carry out a noise pollution survey.

Figure 5

Noise Level	Description
1	Can hear a whisper
2	Can hear normal conversation
3	Can hear raised voices
4	Can only hear shouting
5	Cannot hear conversation at all

0 4 . 5 Suggest **one** advantage and **one** disadvantage of using the noise pollution table shown in **Figure 5**.

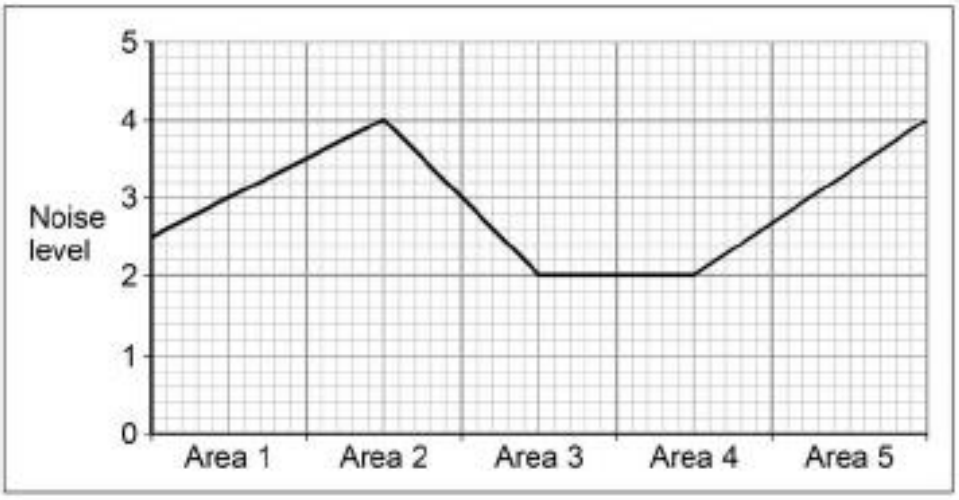
[2 marks]

Advantage:

Disadvantage:

Study **Figure 6**, a diagram showing how a student presented the noise pollution survey data.

Figure 6



0 4 . 6 Suggest a more appropriate way of presenting the noise pollution data shown in **Figure 6**.

[2 marks]

Give **one** reason for your choice.

Students measured the flow of water in two different rivers over 7 days. **Figure 7** shows the results, in rank order, for the two rivers.

Figure 7

	River A (Flow in cubic metres/second)	River B (Flow in cubic metres/second)
	6.2	11.8
Upper quartile →	6.0	10.4
	5.6	8.7
	5.2	5.1
	5.0	2.1
Lower quartile →	4.5	1.4
	3.7	1.2
Median	**5.2**	**5.1**
Interquartile range	**1.5**	

0 4 . 7 Complete the table (**Figure 7**) by calculating the interquartile range for River B.

[1 mark]

0 4 . 8 Suggest why median and interquartile values are useful when comparing data such as that shown in **Figure 7**.

[4 marks]

References

https://www.tes.com/teaching-resource/geographical-skills-revision-booklet-ks3-and-ks4-11872979

http://www.oaklands.hants.sch.uk/_site/data/files/documents/subjects/geography/A7986022DFBD4AE39D4EA09A74E9A197.pdf

https://www.teachitgeography.co.uk/resources/ks3/maps-and-map-skills/exploring-and-mapping-the-world/understanding-contour-lines/25112

https://www.tes.com/teaching-resource/aqa-gcse-geography-skills-workbook-11058377

http://arkwilliamparker.org/sites/default/files/GCSE%20Geography%20Revision%20Booklet-%20AQA%208035.pdf

http://thewilnecoteschool.com/wp-content/uploads/2017/03/Geographical-skills-booklet.pdf