
SKILLS
BUY

Question 1: **Natural Hazards**

- What are natural hazards?
- Distribution of earthquakes and volcanoes.
- Physical process at plate margins.
- The effects of earthquakes - Chile and Nepal
- The responses of earthquakes - Chile and Nepal
- Living with the risk from tectonic hazards
- Reducing the risk from tectonic hazards.
- Global atmospheric circulation
- Where and how are tropical storms formed?
- The structure and features of tropical storms.
- Typhoon Haiyan - a tropical storm example.
- Reducing the effects of tropical storms
- Weather hazards in the UK
- The Somerset Levels Flood 2014, Cause, effects and responses.
- Extreme Weather in the UK
- What is the evidence for climate change?
- What are the natural causes of climate change?
- What are the physical causes of climate change?
- Managing the impacts of climate change.

Question 2: **The Living World**

- Small scale ecosystem
- How does change effect an ecosystem
- Introducing global ecosystems
- Characteristics of rainforests
- Causes and impacts of deforestation in Malaysia
- Managing tropical rainforests
- Sustainable management of tropical rainforests.
- Characteristics of hot deserts
- Opportunities and Challenges of development in hot deserts - The Thar Desert
- DO NOT COMPLETE COLD ENVIRONMENTS

Question 3: **Coasts**

- Wave types and thier characteristics
- Weathering and mass movements
- Coastal erosion processes
- Coastal erosion landforms
- Coastal deposition landforms.
- Coastal landforms examples - Swanage
- Managing coasts - hard and soft engineering
- Managing coasts - managed retreat
- Coastal management at Lyme Regis

Question 4: **River Landscapes**

- Changes in rivers and thier valleys
- River provesses
- River erosion landforms - v shaped valleys, waterfalls.
- River erosion and deposition landforms - meanders and oxbow lakes
- River landforms on the River Tees
- Factors increasing flood risk, inlcuding hydrographs
- Managing floods - hard and soft engineering.
- Managing floods at Banbury

Geographical SKILLS

Your geographical skills will be tested throughout all the papers and in particular paper 3.

For your GCSE exam you will have to be able to use the following skills:

- Cartographic skills
- Graphical skills
- Numerical skills
- Statistical skills
- Use of qualitative and quantitative data
- Formulate enquiry and argument
- Literacy

Presenting data

There are numerous ways of presenting data. A few of these are shown on the next few slides. A question in paper 3 might ask you about how you presented your fieldwork data

Quantitative Data

Quantitative data is data which involves number based results. This is much easier to analyse and can help prove a hypothesis. Most data collected on your physical fieldtrip (Dawlish) is quantitative. **You must appreciate your sample size and sample collection technique**

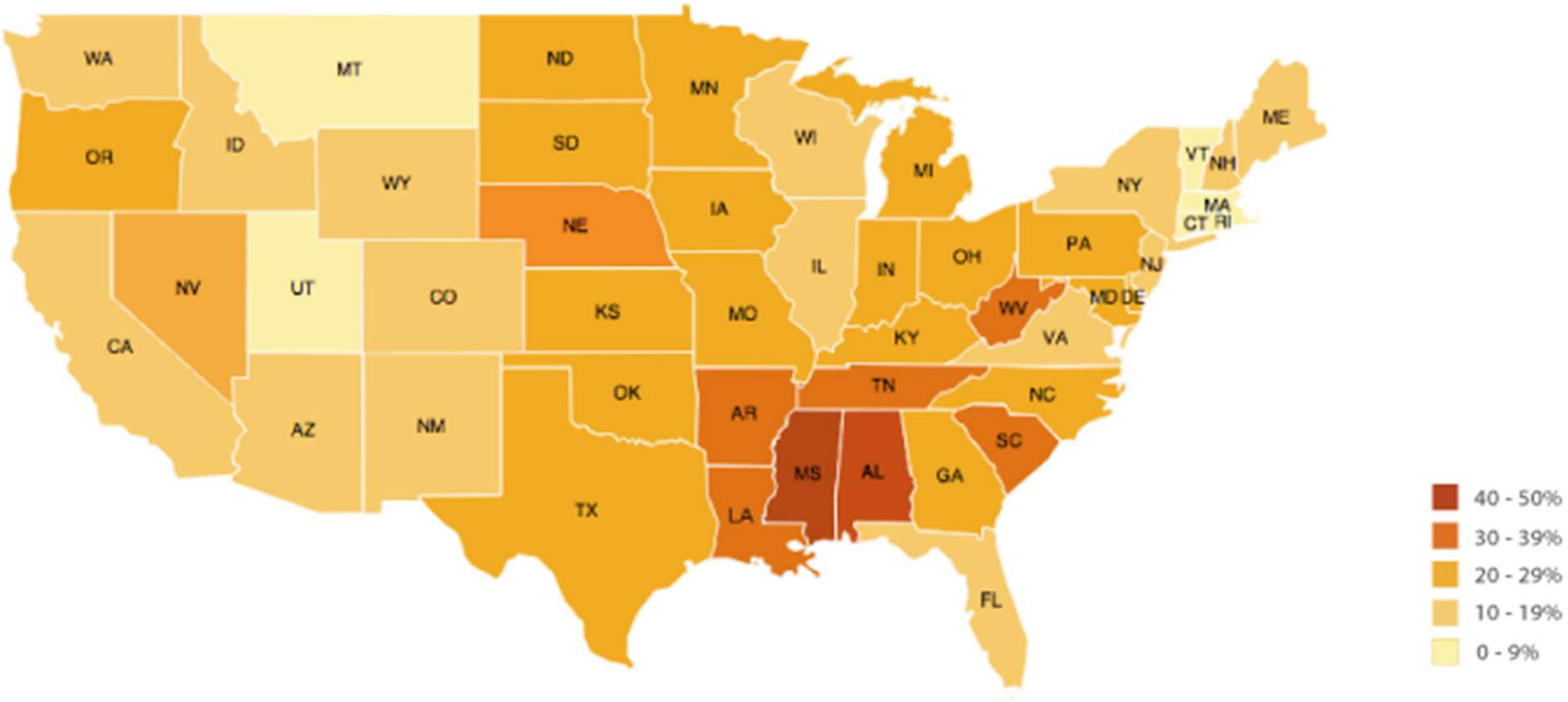
- **Random –** Where samples are chosen at random
- **Systematic** – Working to a system to collect data – For example at every other groyne section
- **Stratified –** Deliberately introducing bias into the investigation so you answer the question (e.g) asking slightly older people questions in Bristol

Qualitative Data

Qualitative data is when you have collected data that don't involve numbers or counting. It involves judgement instead. These include questionnaires, photographs, videos, field sketches. Be mindful though that it is possible to convert qualitative data into quantitative data (e.g. using a Environmental Quality index)

Choropleth maps

Choropleth Maps. These are **maps**, where areas are shaded according to a prearranged key, each shading or colour type representing a range of values. Population density information, expressed as 'per km²,' is appropriately represented using a **choropleth map**.



Exam Practice

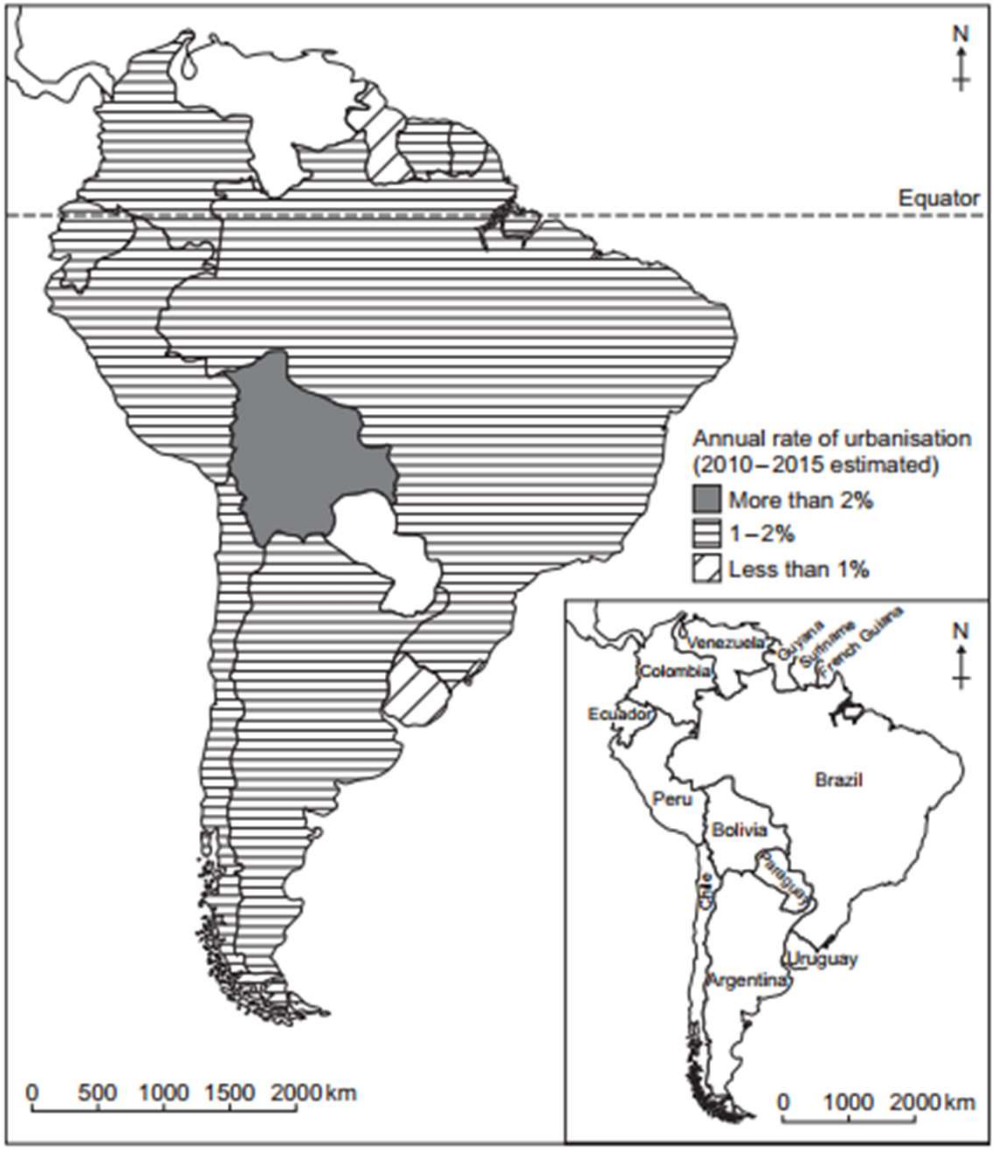
Study **Figure 3**, a map showing the annual rate of urbanisation of countries in South America (2010-2015 estimated).

a) Complete **Figure 3** Use the information below. **[2 marks]**
Paraguay = 2.5%
Venezuela = 1.7%

b) Name one country in South America with an annual rate of urbanisation less than 1%. **[1 mark]**

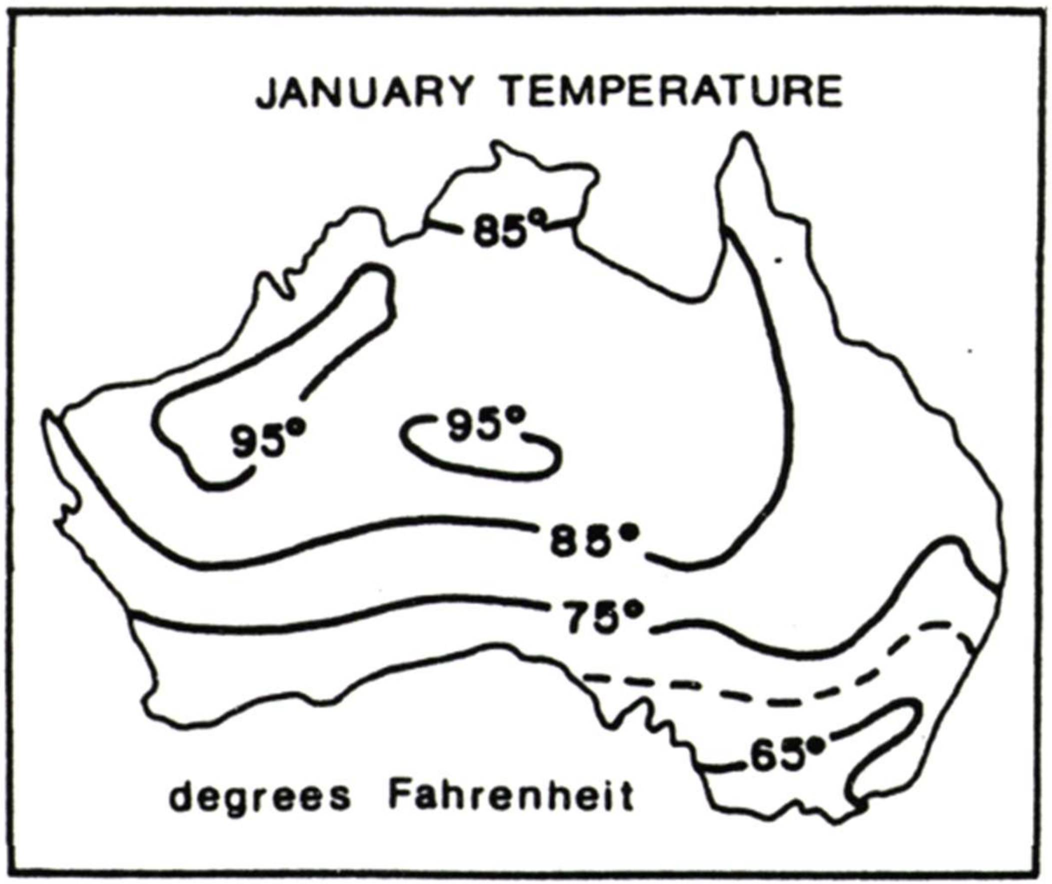
(c) What is the name of the type of map used in **Figure 3** to show the annual rate of urbanisation? **[1 mark]**

Figure 3



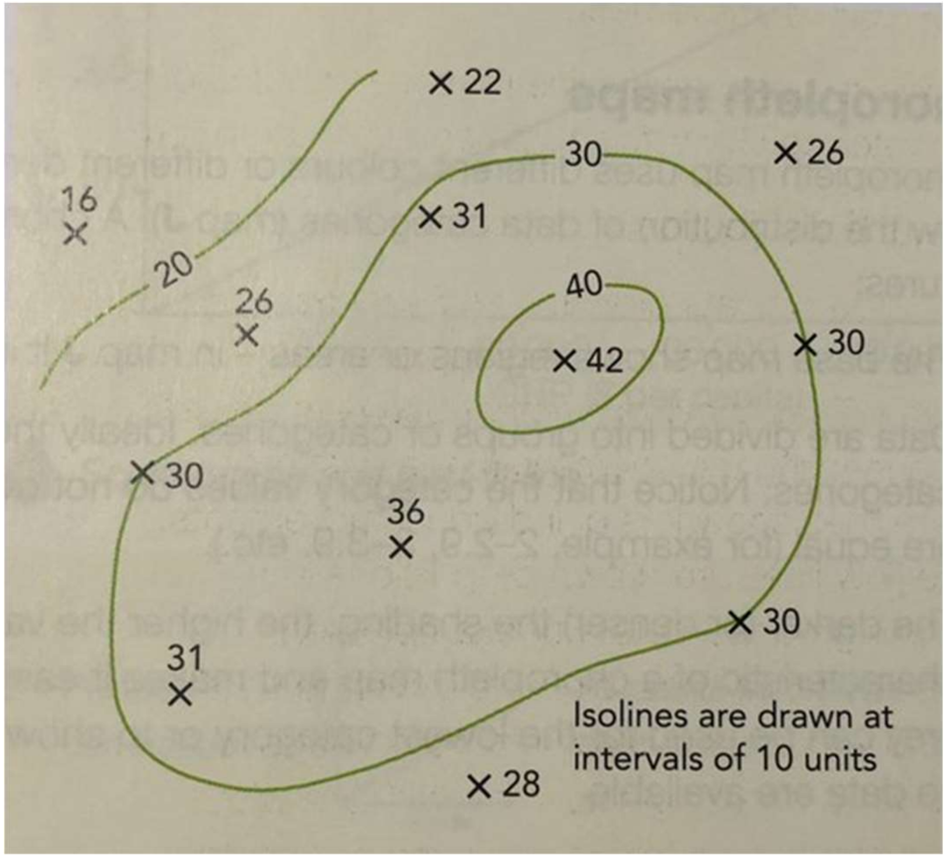
Isoline maps

Isoline maps use lines of equal value to show patterns (iso means equal) some common examples are weather pressure maps and contour lines. They are tricky to draw and every ones maps will look slightly different. You will be awarded marks if it is in the general right place.



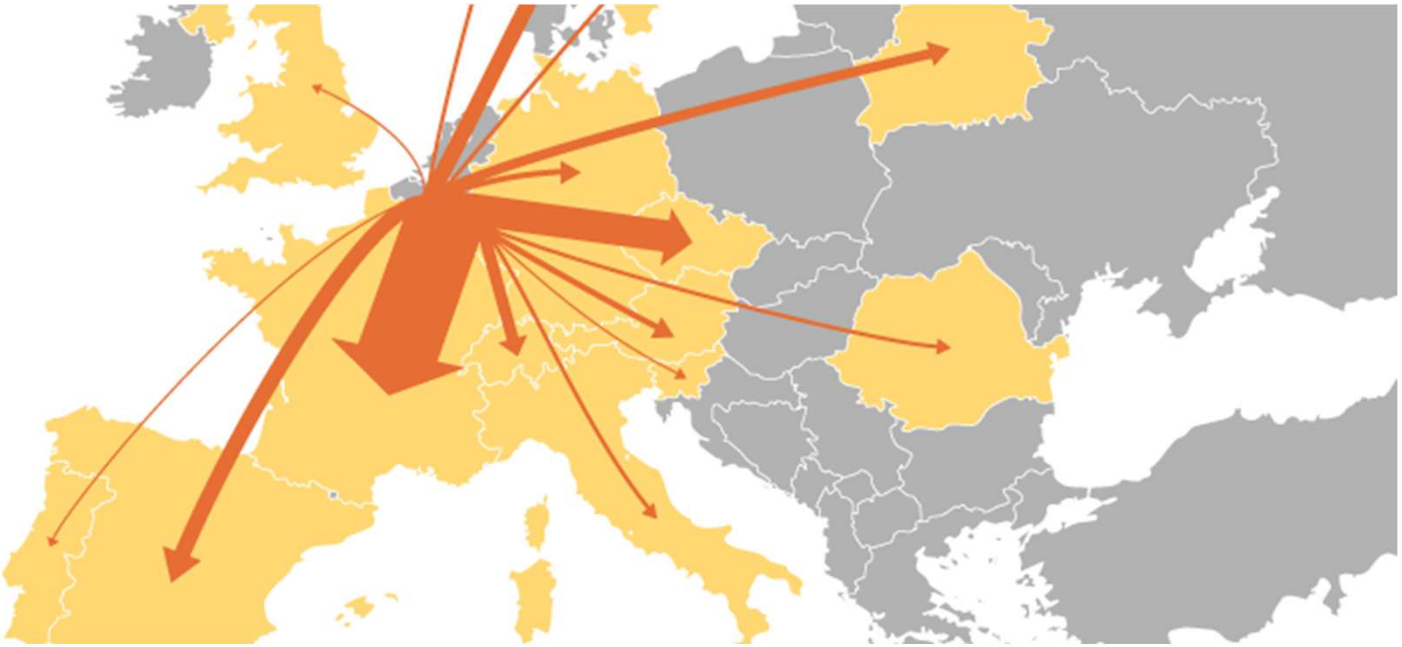
Isoline maps

To draw one you mark your observed data onto a map. In an exam this will be given to you. Then consider your intervals between the lines (usually in 5s / 10s / 100s). Then pass your line between the values that are higher and lower than the value of the line. Lets imagine we were asked to draw the iso line for 36, 31 & 26

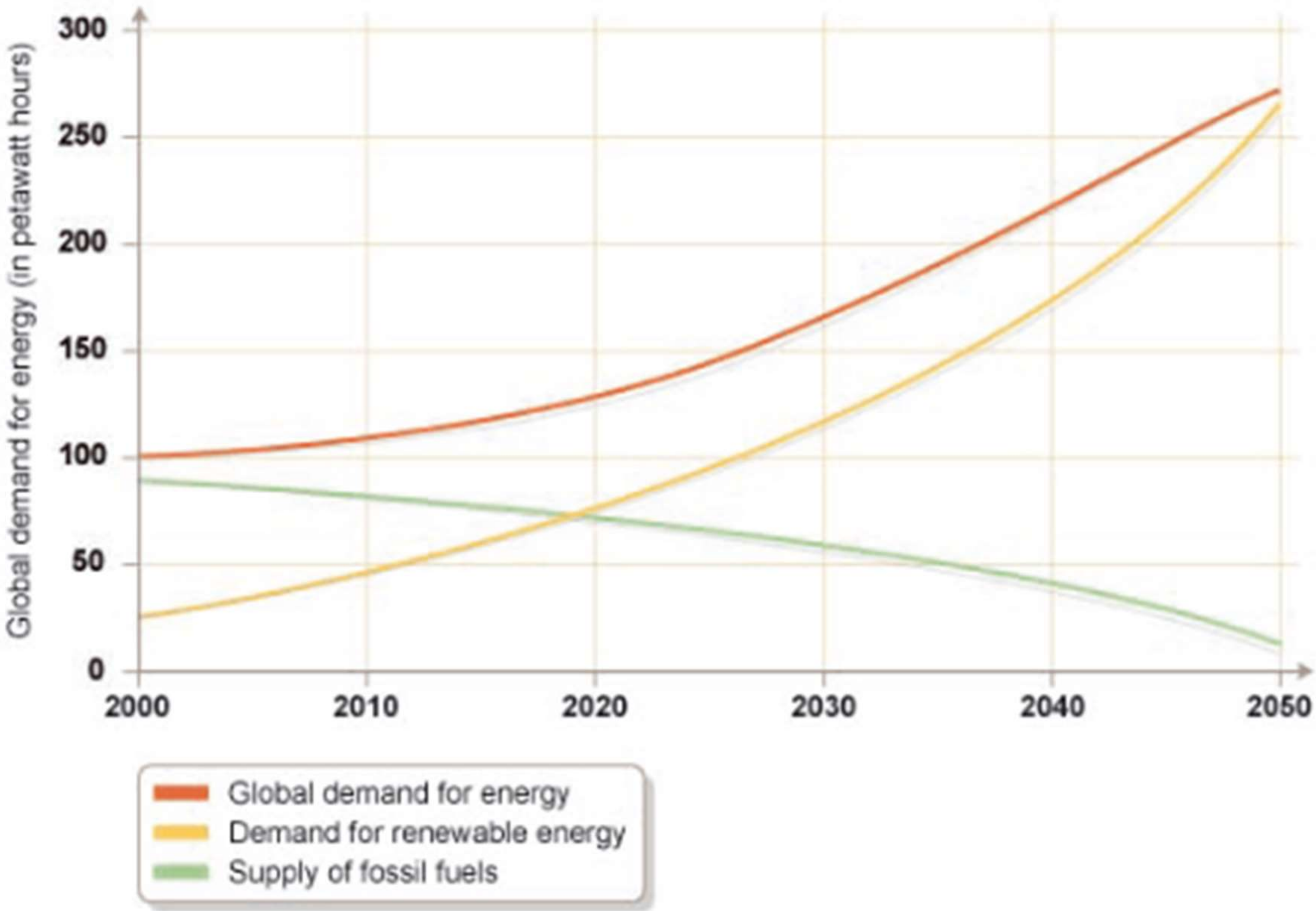


Flow Line maps

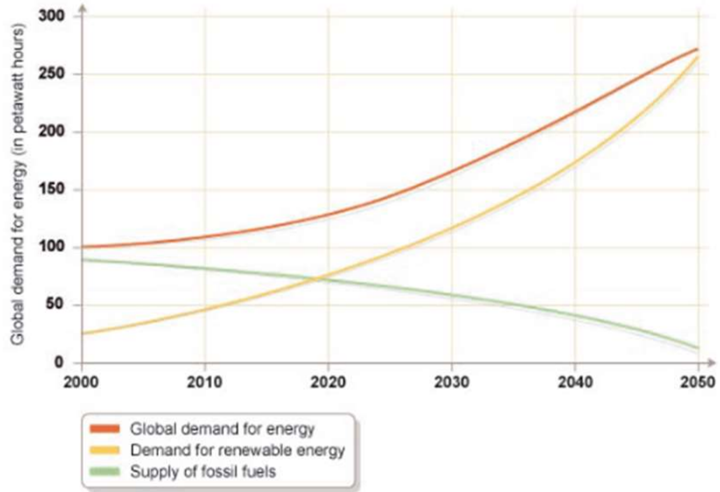
These show a 'flow' or movement of something across the study area. The larger the flow, the more of that thing is moving. Usually associated with showing migration or trade.



Line graphs


Global demand for energy (in petawatt hours)
300
250
200
150
100
50
0
2000
2010
2020
2030
2040
2050
Global demand for energy
Demand for renewable energy
Supply of fossil fuels

Line graphs



Most graphs have two axes: the **X axis is horizontal** (across the bottom) while the **Y axis is vertical** (up the left side). The two axes each represent a different set of *data*. **Line graphs** are drawn by plotting points by their X and Y coordinates, then joining them together or drawing a line through the middle.

The line graph above shows how energy consumption is expected to rise, while consumption of *fossil fuels* falls and the demand for *renewable* energy increases

Types of line graph

Comparison

Sometimes different sets of data will be represented on the same line graph, so comparisons can be made. This is sometimes called a **comparison line graph**.

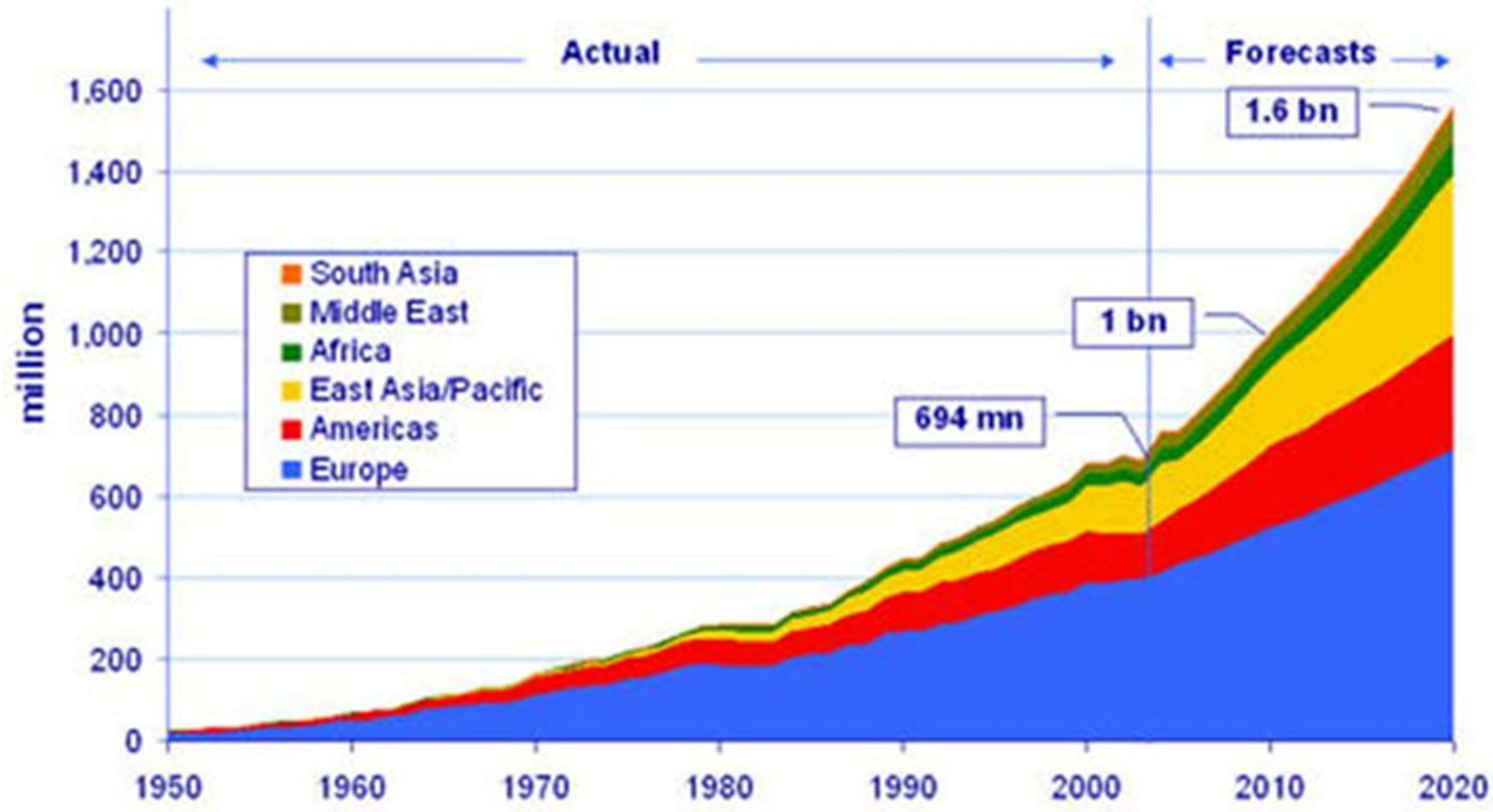
Compound

If information can be subdivided into two (or more) types of data - eg total population growth, female population growth and male population growth - then all three can be drawn on a **compound line graph**.

Scatter

Where the points on a graph do not map into a neat line, a line is drawn through the **middle** of the points to show the trend or correlation. This is called a **scatter graph**.

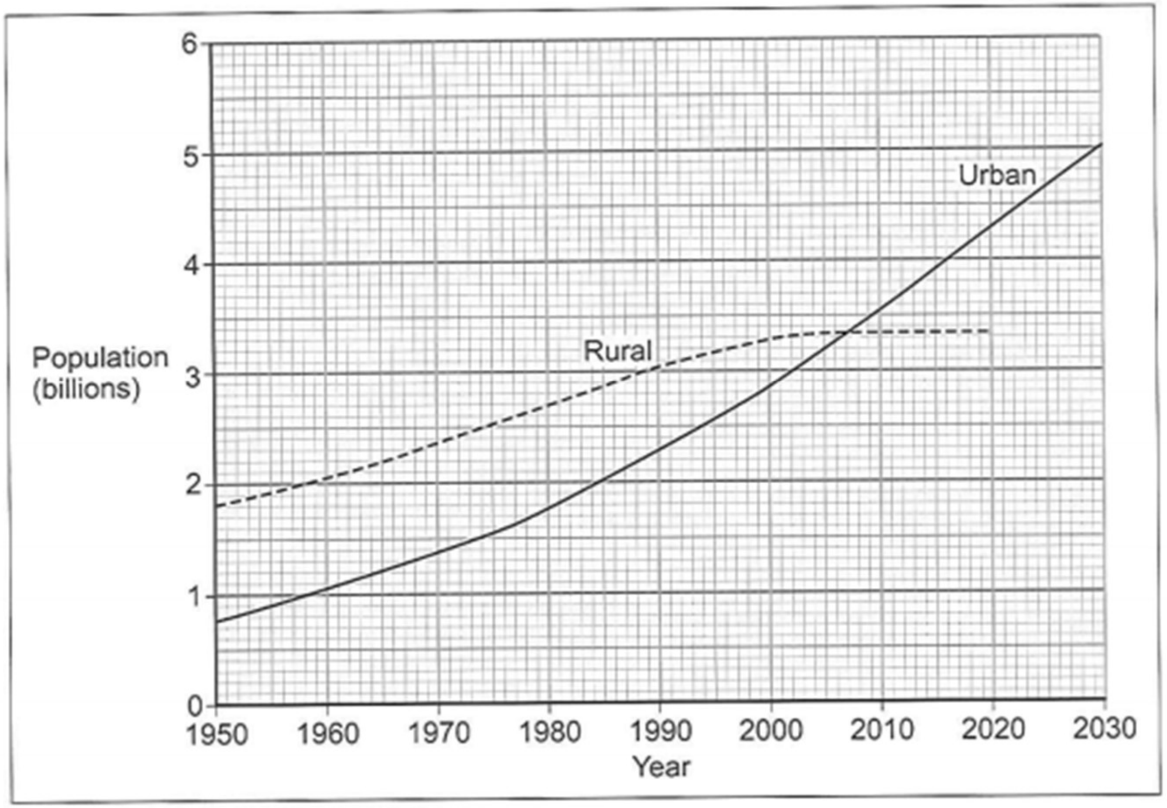
Compound Line graphs



Exam Practice

Study **Figure 4**, a graph showing world rural and urban population between 1950 and 2030 (2010-30 estimated).

Figure 4



a) Complete **Figure 4** to show that the rural population in 2030 is estimated to be 2.3 billion **[1 mark]**

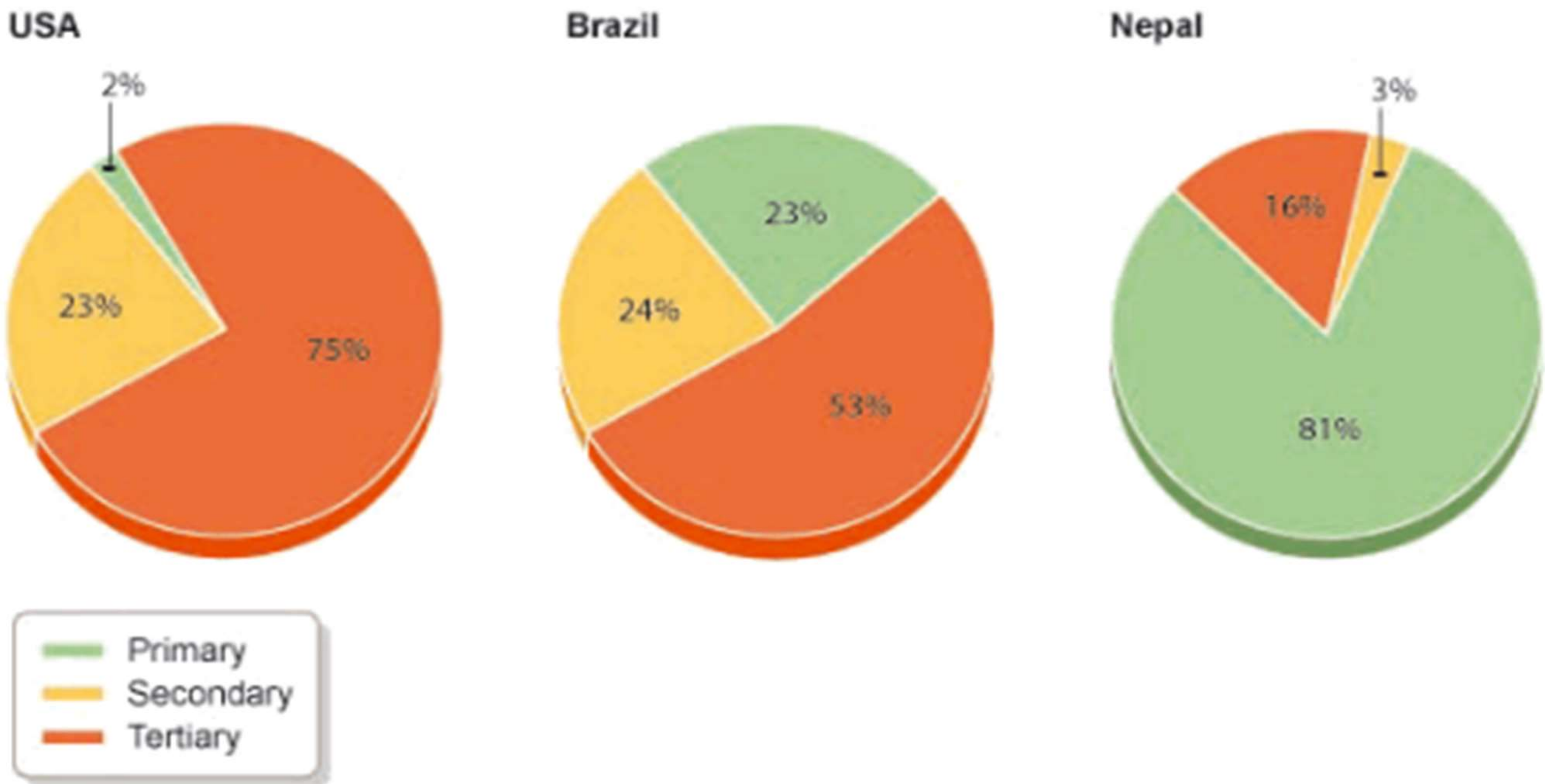
b) Approximately how many more people lived in rural areas compared to urban areas in 1965 **[1 mark]**

0.5 billion
1.0 billion
1.5 billion
2.5 billion

c) In which year did the rural and urban population have the same amount of people? **[1 mark]**

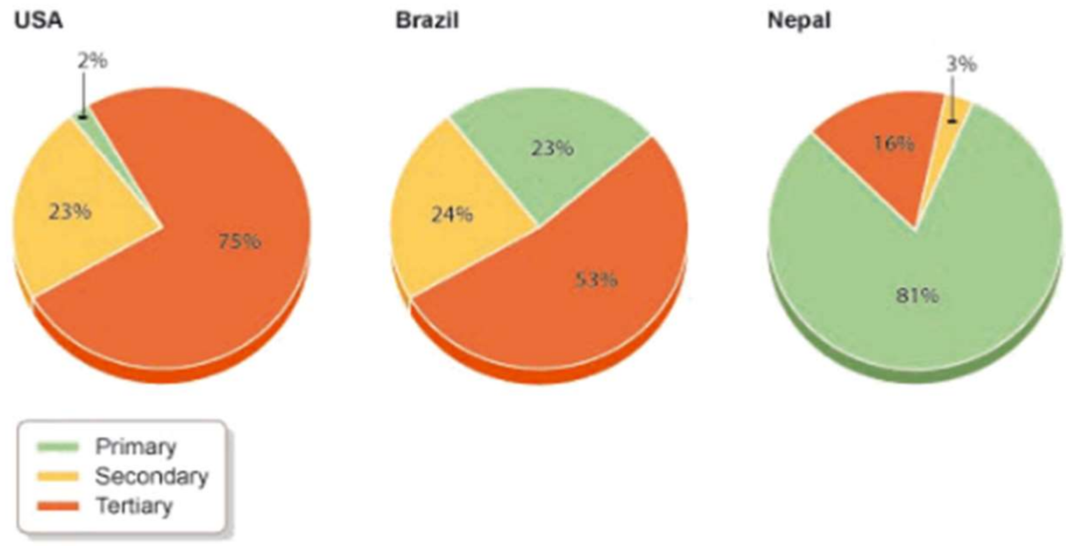
d) Describe the trend in urban population between 1950 and 2030 **[2 marks]**

Pie graph



Pie charts showing employment types in a given country.

Pie graph



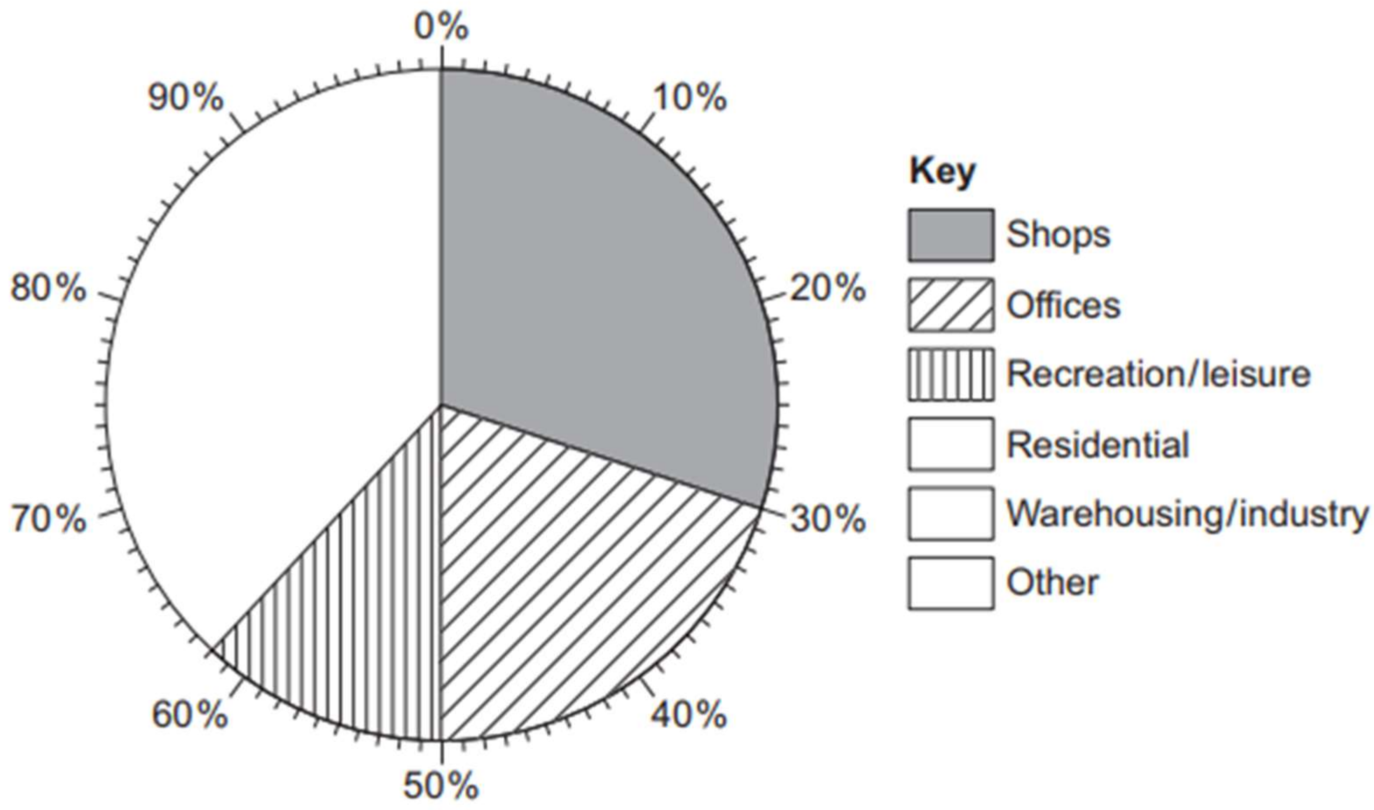
Pie charts showing employment types in a given country.

Pie charts are used for showing how something breaks down into its constituent parts.
Pie charts are usually drawn so the biggest piece of pie comes first (starting at 12 o'clock).
The 'others' section usually goes last (coming up to 12 o'clock).
If each piece of pie has its percentage written in, it's easier for the reader to work out the exact proportions.
The pie charts below show differences in the split between primary, secondary and tertiary employment in USA, Brazil and Nepal.
In this example the circles are the same size. It would also have been possible to make the size of the circle proportional to the size of each country's labour market. Pie charts like this are sometimes called **proportional circles**.

Exam Practice

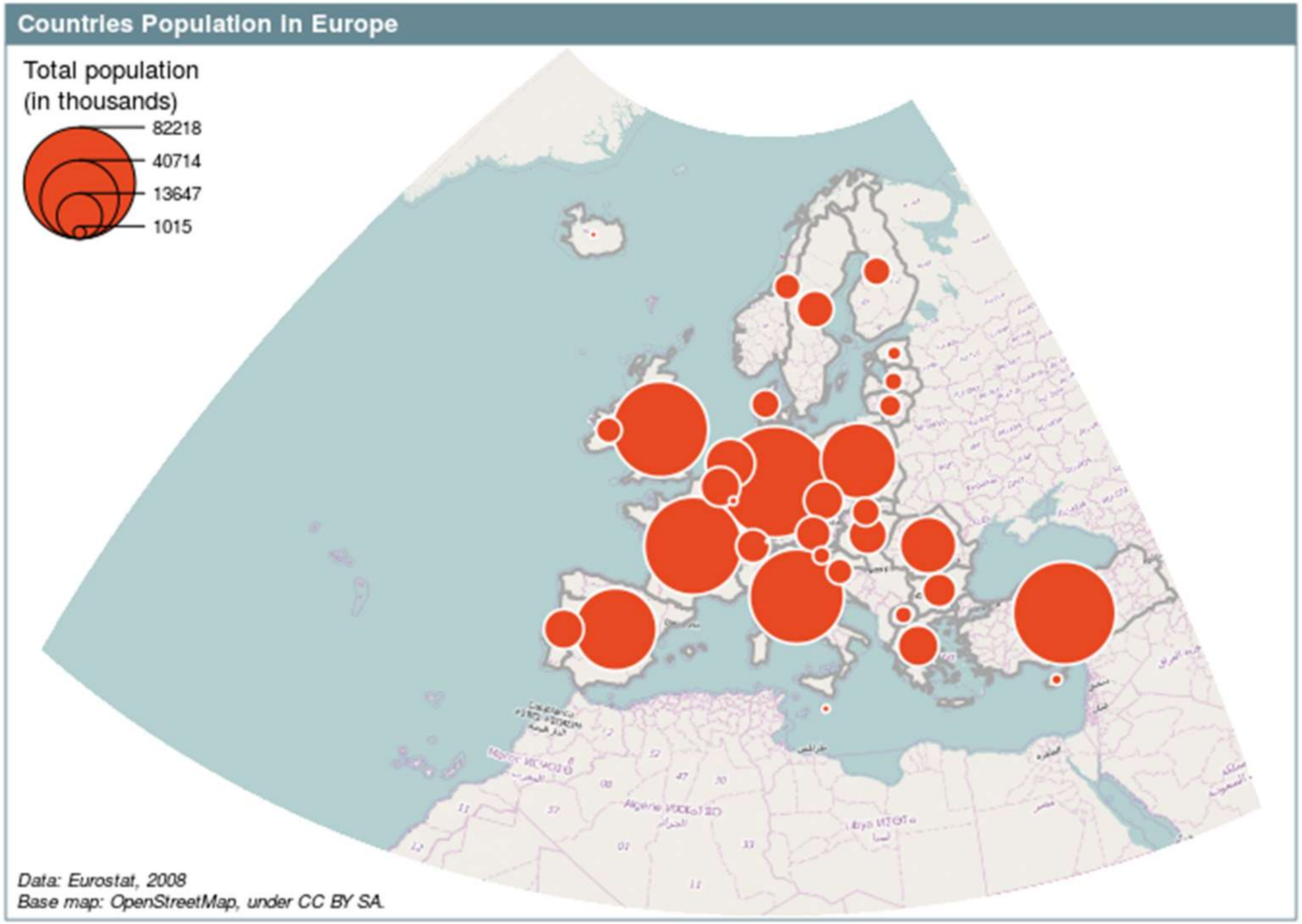
Complete the following diagram and key showing the results of a land use survey carried out by the students in the town centre. Use the following data. **[3 marks]**

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



Proportional symbols map

Proportional symbol maps scale the size of simple **symbols** (usually a circle or square) proportionally to the data value found at that location. They are a simple concept to grasp: The larger the **symbol**, the “more” of something exists at a location.



Exam Practice

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

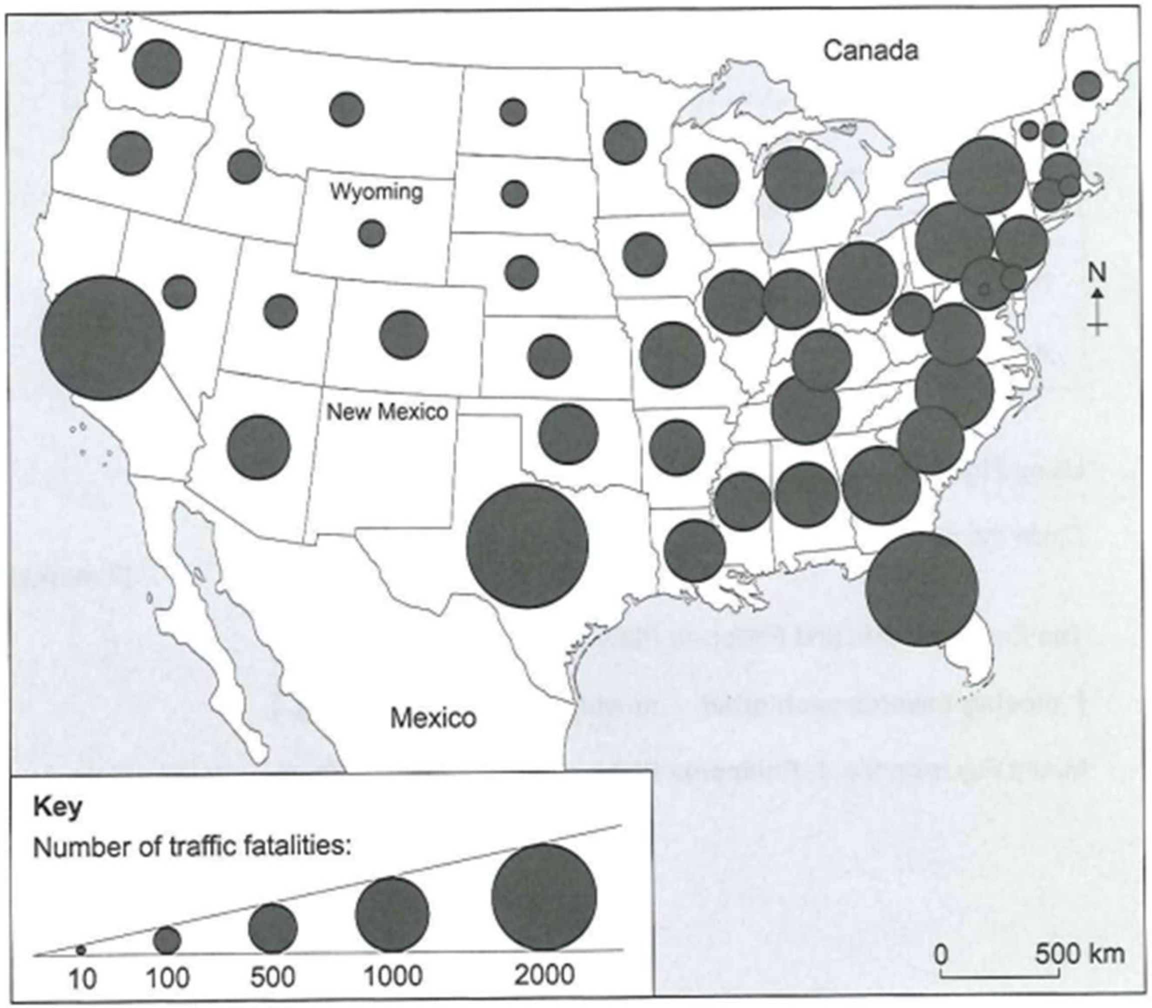
a) What is the name of the type of map used in **Figure 3**? **[1 mark]**

b) How many traffic fatalities were there in Wyoming in 2009? **[1mark]**

52
103
187
248
503

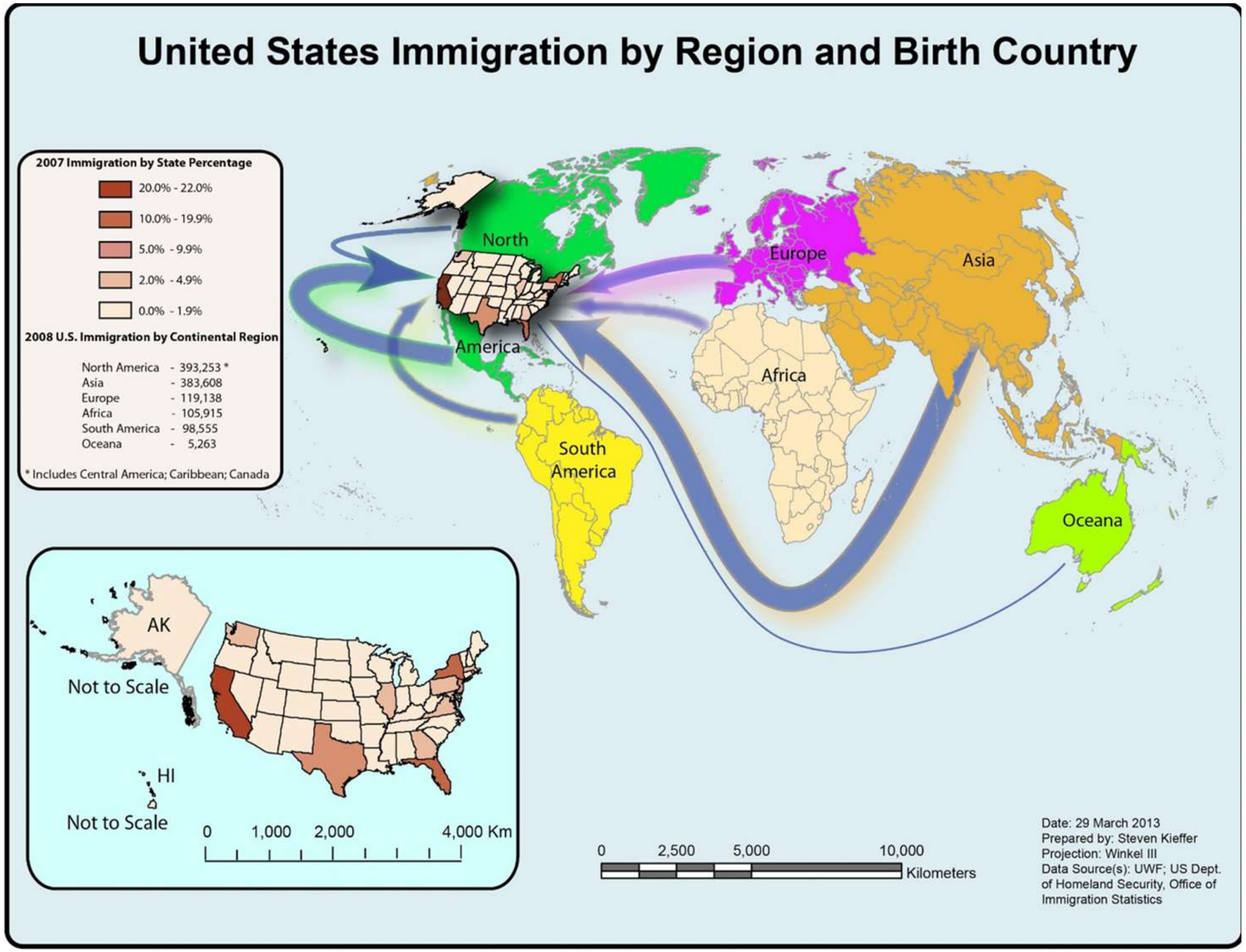
(c) Describe the distribution of traffic fatalities in the USA in 2009? **[4 marks]**

Figure 3

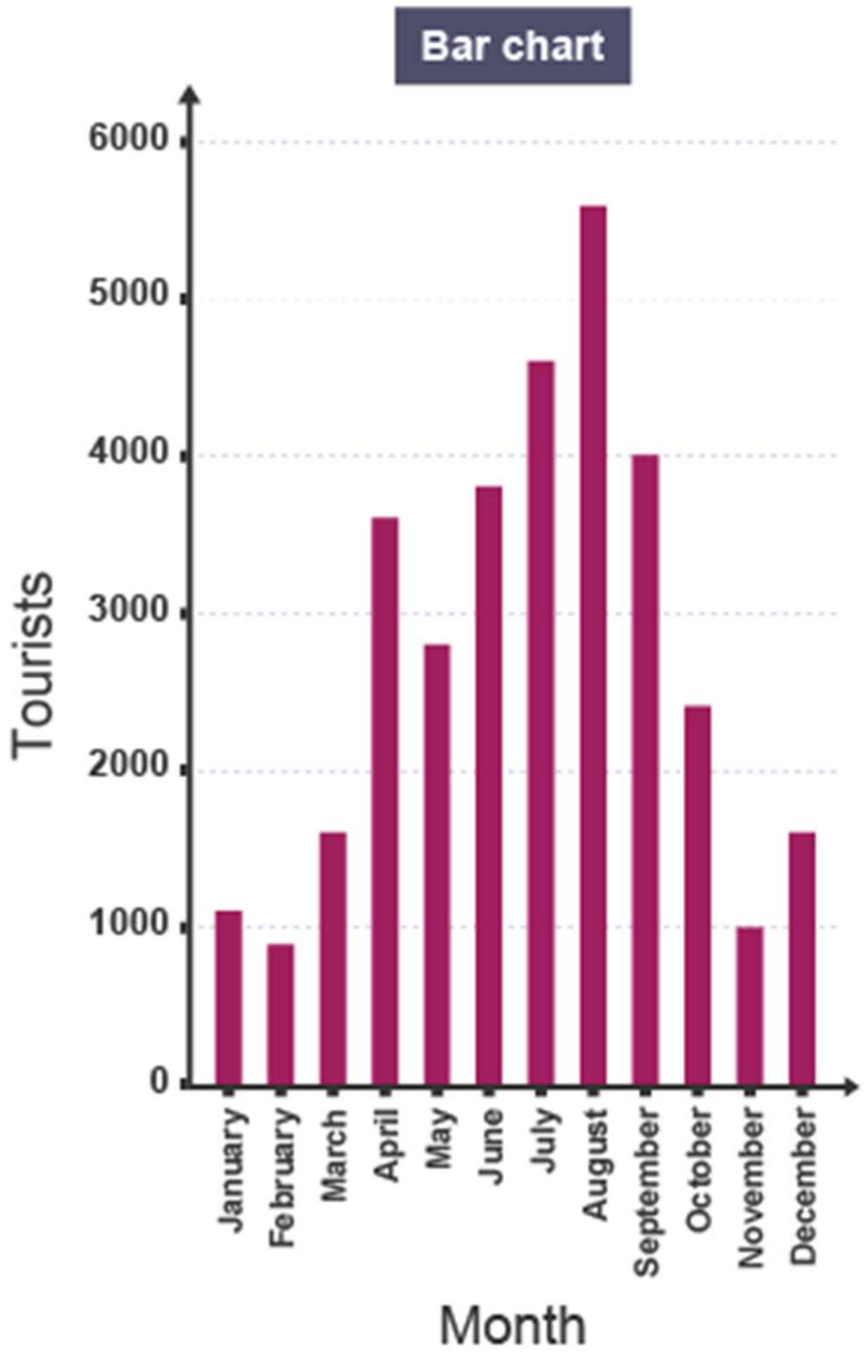


Flow line map

Flow maps typically use **lines** to show the movement of people and goods between various locations. The **lines** are varied in width to represent the quantity of **flow**

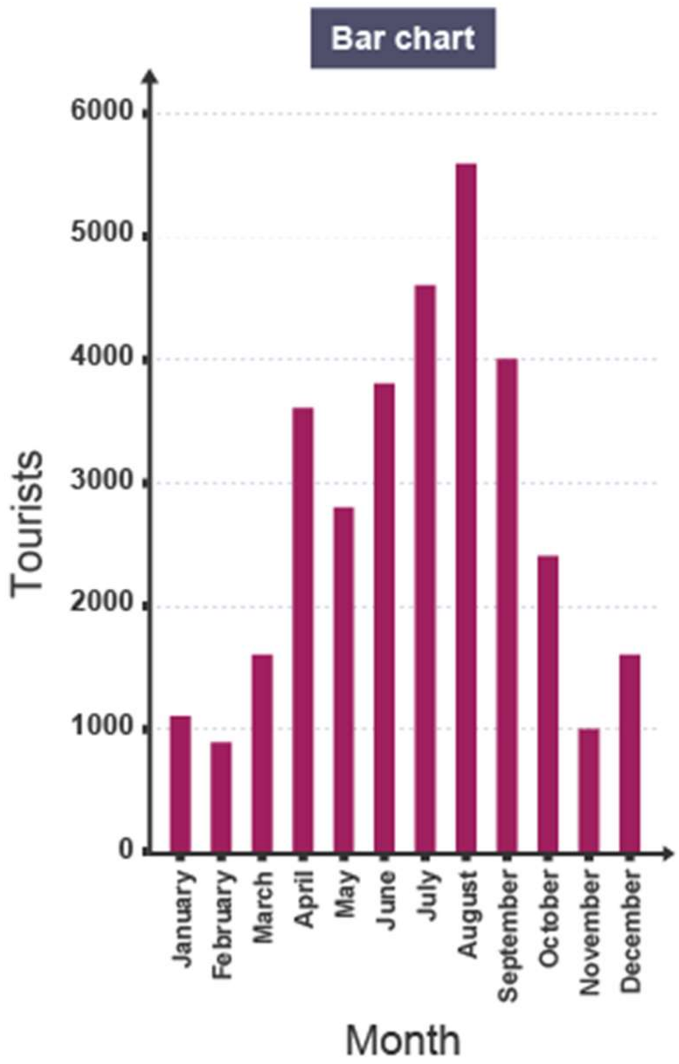


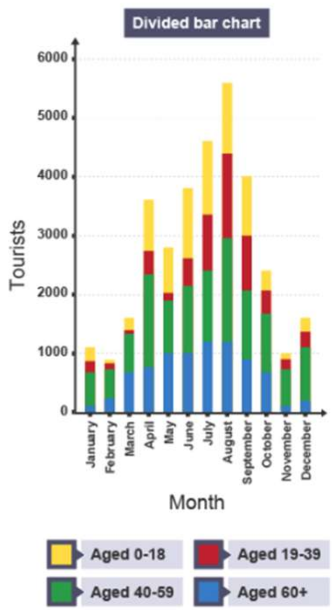
Bar gra


Bar chart
6000
5000
4000
3000
2000
1000
0
Tourists
January
February
March
April
May
June
July
August
September
October
November
December
Month

Bar graph

Bar graphs (bar charts) are one of the simplest forms of displaying data. Each **bar** is of the same width but of varying length, depending on the figure being plotted. The bars should be drawn an equal distance apart. The data used for a bar chart is discrete data. This means that it is a discrete (separate) piece of information. An example would be the number of tourists visiting a resort each month.

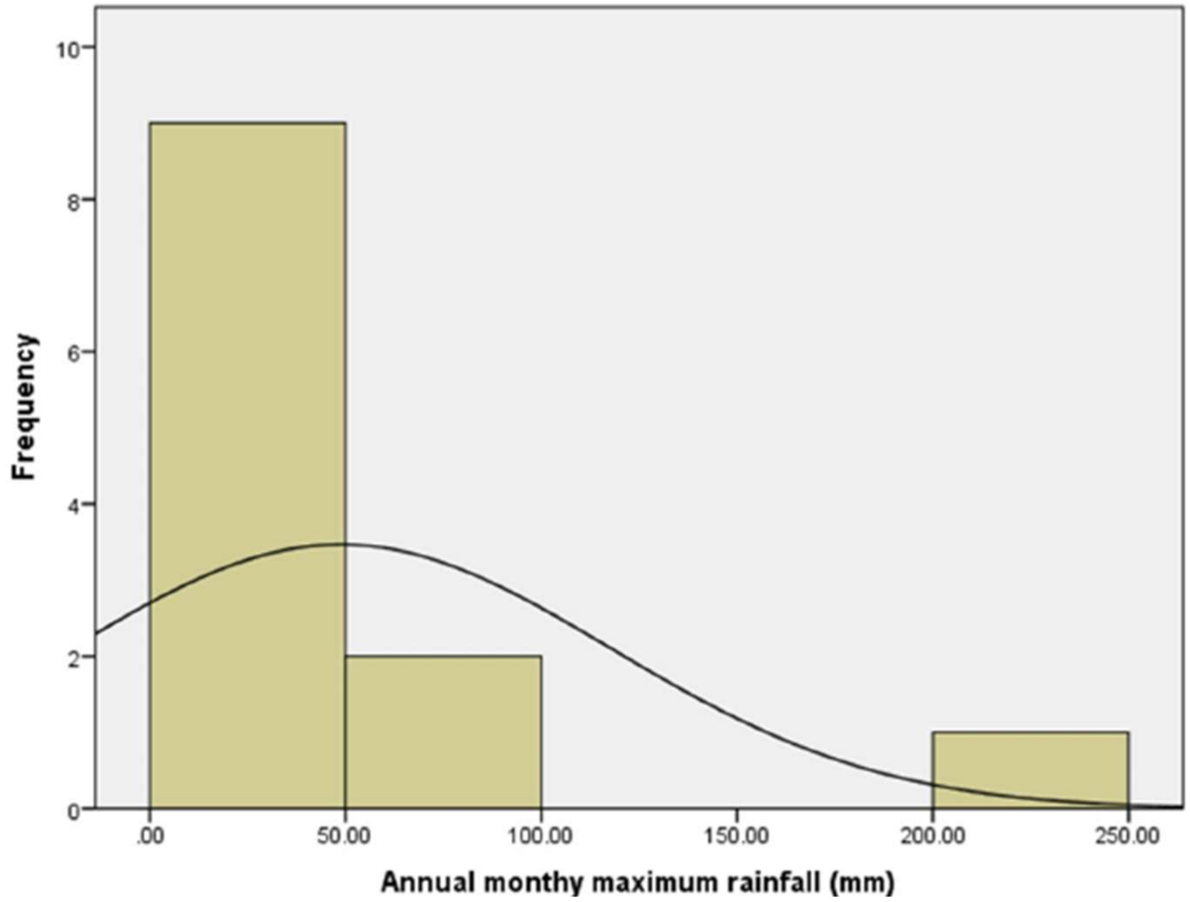




In **divided bar graphs**, the bars are subdivided on the basis of the information being displayed. A divided bar chart could be used to show the age breakdown of tourists visiting a resort.

Histograms

Histograms are very similar to bar charts but do not have gaps in between the data sets. This is because it represents continuous data (like rainfall values over a month) or the values may all be part of a single sample e.g. sizes of particles in sediment sample (frequency)



Exam Practice

Study **Figure 14**, a graph showing global energy consumption, 2008-2035.

a) Use the following data to complete **Figure 14. [2 marks]**

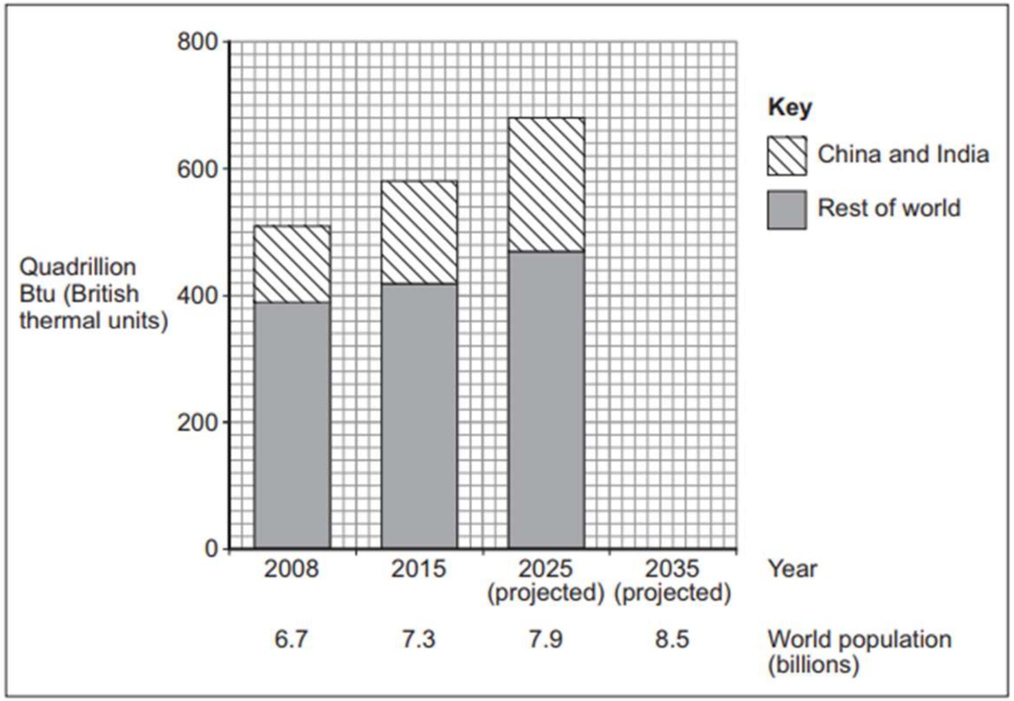
	Energy consumption in quadrillion Btu, 2035
Rest of world	520
China and India	240

b) What type of graph is being used in **Figure 14? [1 mark]**

b) What is the projected energy consumption for China and India in 2025? **[1 mark]**

b) Describe the trend in energy consumption between 2008 and 2035. **[2 marks]**

Figure 14



Data Analysis

You will be expected to do some simple data analysis (statistics) in Paper 3 – SO BRING A CALCULATOR. You will also need to be able to talk about what your data is showing you.

Some of these are really easy – so don't panic!!

Measures of central tendency (average)

Mean is calculated very simply, by adding up all the values in a data set and then dividing by the number of values.

Example

10, 14, 8, 16, 14, 9, 12, 18, 10, 9

Mean is 120 divided by 10 = 12

Example

Odd number of values:

13, 13, 13, 13, 14, 14, 16, 18, 21

The median is the 5th value = 14

Even number of values:

12, 13, 13, 13, 14, 16, 16, 18, 21, 24

The median lies mid-way between the 5th value (14) and the 6th value (16). This can be calculated by adding the two values together and dividing by two.

14 + 16 = 30 / 2 = 15

Median is the central (middle) value in a ranked data set. If there is an odd number of values, identifying the middle value is easy. If there is an even number of values, the median lies midway between the two central values.

The **mode** is the most common value in a data set. If there are no repeated values then there is no mode in the data set.

Example

13, 13, 13, 13, 14, 14, 16, 18, 21

Here the value 13 is stated four times whereas the value 14 is only stated twice. The mode value is 13.

Exam Practice

The figures in the table below show river data collected at 8 sites on the River Dart. Site 1 is close to the source (or start) of the river.

Site	Width of river (m)	Depth of river (cm)	Gradient (°)	Speed (velocity) of water in metres per second
1	0.7	5	5	0.2
2	0.9	3	3	0.4
3	1.6	5	2	0.7
4	2.1	8	4	0.5
5	1.3	18	2	0.6
6	5.7	12	1	0.8
7	8.9	29	1	1.1
8	8.0	22	1	1.2

a) Calculate the mean width of the river. **[1 mark]**
b) Calculate the mode gradient. **[1 mark]**
c) Calculate the median depth. **[1 mark]**

Measures of Spread

Range is the difference between the highest and lowest values. It gives us a good idea spread and gives us another means of description to use along with the average.

Example

10, 14, 8, 16, 14, 9, 12, 18, 10, 9

Range – 16-8 = 8

Example

Even number of values:

12, 13, 13, 13, 14, 16, 16, 18, 21, 24

14 + 16 = 30 / 2 = 15

With 10 values – the median lies between the 10th and 11th value, the lower quartile is the 3rd and upper us the 8th

An easy way to remember is: (n+1)/4. This will give you the lower quartile. Multiple this by 3 to get the upper quartile.

In our case, 13 is the LQ and 5 is the UQ. Therefore the IQR is 5

Quartiles and Interquartile Range is a useful method for discussing the degree of clustering or dispersal of values around the mean. Basically, is your data spread out or close to the median. The median is the middle value splitting data into 2 halves. These halves can be split again into quarters at a value called the quartile. The Inter Quartile Range (IQR) is the difference between the upper quartile and lower quartile.

Percentage change and percentiles

Percentage change is usually used in comparing things over period of time. E.g train ticket prices have risen 5% this year

A **percentile** is used to indicate a value within a data set. For example, the median is the 50th percentile / Upper quartile is the 75th percentile and lower quartile 25th percentile

Example

Work out the difference between the comparing numbers

Divide the difference by the original number

Multiply by 100 to give you a percentage. If the answer is a negative then it is percentage decrease,

E.G – Number of bus routes has increased from 24 to 31.

31-24=7 **7/24 = 0.29** **0.29x100 = 29%**

Exam Practice

The number of people from a survey of 100 who thought Cabot Circus was a good shopping destination in 2015 was 80. Whereas in 2018 it was 29. What is the percentage change? Show your working **[2 marks]**

Exam Practice

The figures in the table below show river data collected at 8 sites on the River Dart. Site 1 is close to the source (or start) of the river.

Site	Width of river (m)	Depth of river (cm)	Gradient (°)	Speed (velocity) of water in metres per second
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2	0.9	3	3	0.4
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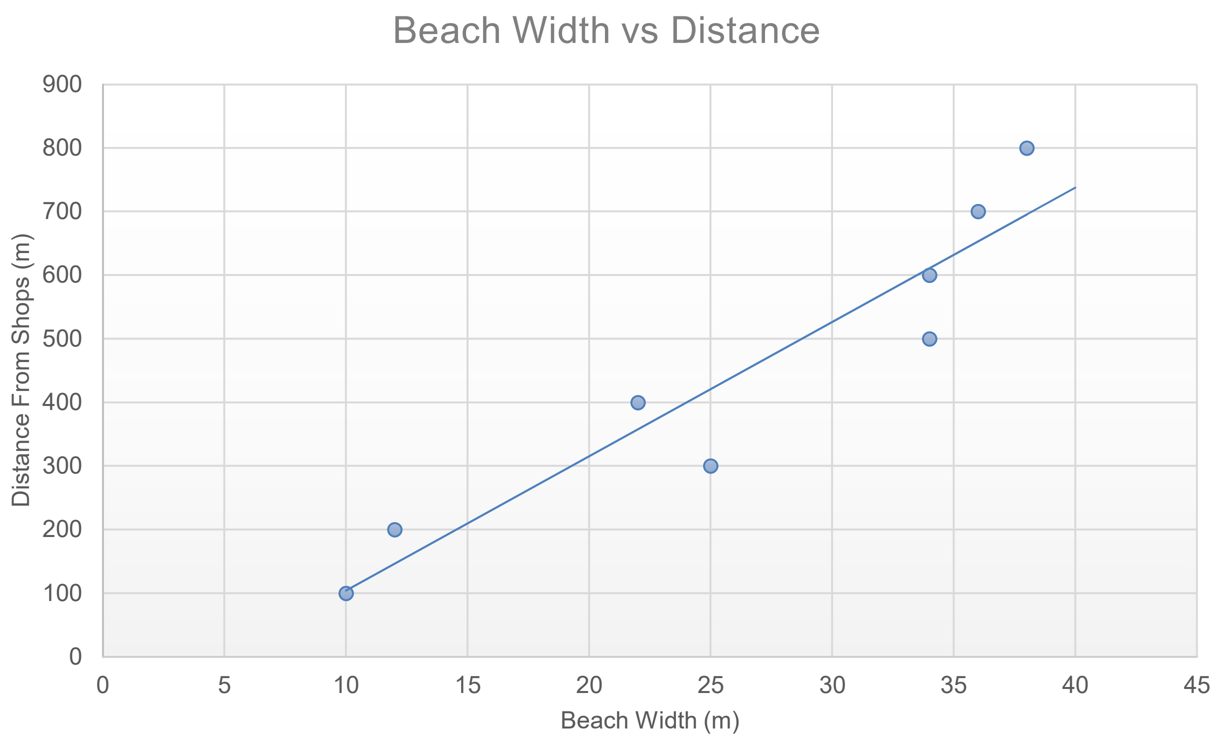
4	2.1	8	4	0.5
5	1.3	18	2	0.6
6	5.7	12	1	0.8
7	8.9	29	1	1.1
8	8.0	22	1	1.2

a) Calculate the LQ for the Gradient. **[1 mark]**
b) Calculate the UQ for the Gradient. **[1 mark]**
c) Calculate the IQR. **[1 mark]**

Scatter Graphs

If two sets of data are thought to be related, they can be plotted on a scatter graph. To complete one must have your two variables on both axis. Then plot the pairs of values on the graph. Finally, draw a line of best fit going in the middle of the points.

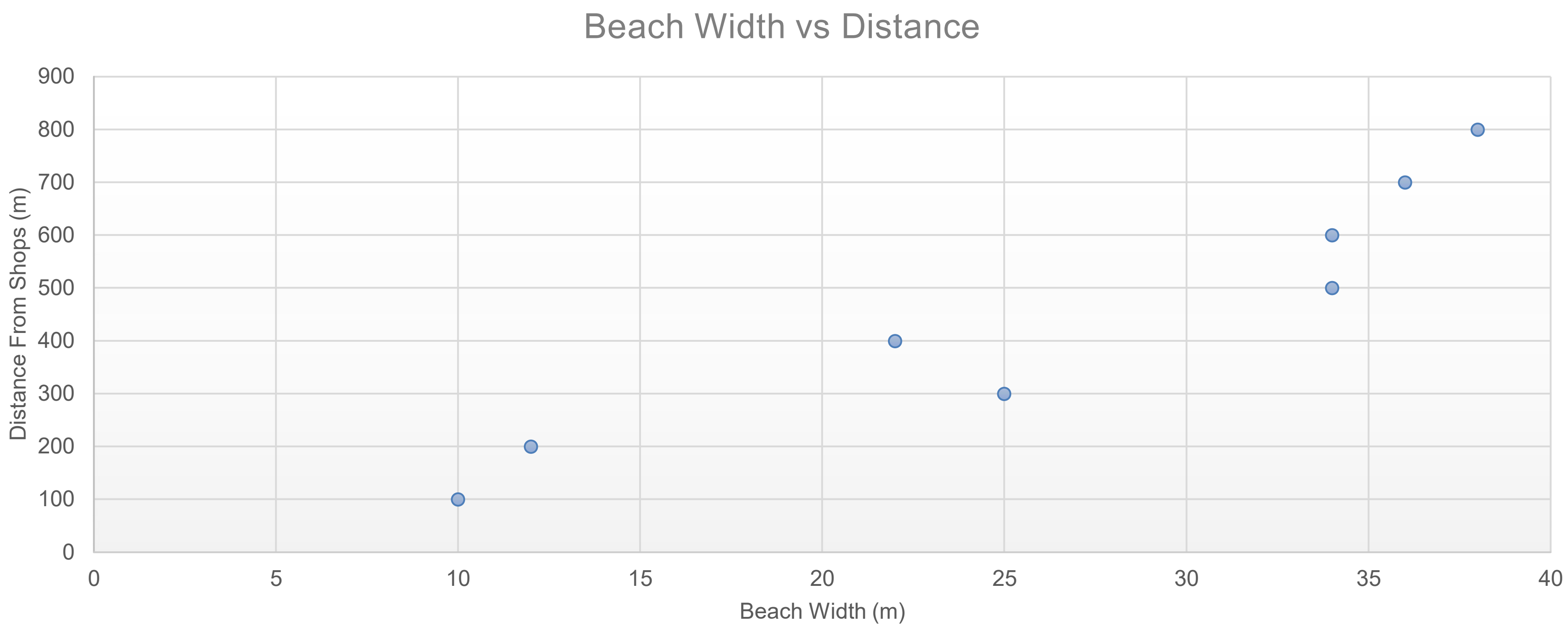
Distance	Width
0m	10
100	12
200	25
300	22
400	34
500	34
600	36
700	38
800	39



An exam may ask you to interpolate and / or extrapolate. This is where you estimate an unknown value using your line of best fit.
Interpolate = within the data set
Extrapolate = Outside the data set

Exam Practice

The graph below is incomplete



a) Add the following piece of data to the graph **[1 mark]**
Distance – 350m   Width – 25m.

b) Plot on the line of best fit **[1 mark]**

Spearman’s Rank

YOU WILL NOT BE ASEKD TO COMPLETE IN YOUR EXAM BUT CAN TALK ABOUT IT IN YOUR FIELDWORK ANALYSIS / DATA PRESENTATION SECTIONS.

Spearman’s rank is a method of proving if there is a correlation between two data sets. For example is there a relationship between the distance from the shops at Dawlish Warren and the Beach Width:

Distance	r1	Width	r2	D	D^2
0m	9	10	9	0	0
100	8	12	8	0	0
200	7	25	6	1	1
300	6	22	7	-1	1
400	5	34	4.5	0.5	0.25
500	4	34	4.5	-0.5	0.25
600	3	36	3	0	0
700	2	38	2	0	0
800	1	39	1	0	0
				TOTAL	2.5

$$r_s = 1 - \frac{6\Sigma d^2}{n^3 - n}$$

$$\frac{(6 \times 2.5)}{9^3 - 9}$$

15/720 = 0.021

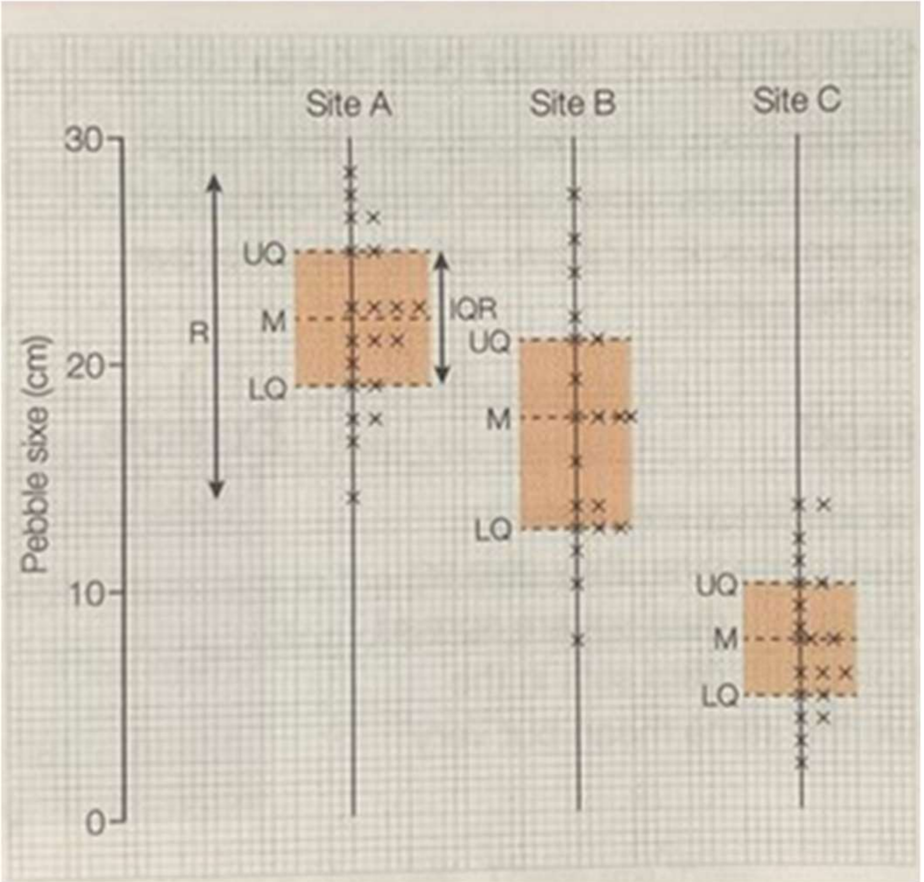
1-0.021= **0.979.**

This shows a very strong positive correlation

Close to 1 = positive
Close to -1 = negative
Close to 0 = random

Dispersion Graphs

We are able to show the spread of data through a graph known as a dispersion graph. They are a useful way to make comparisons between different data sets for example locations along a river or across a beach. They are a method of visualising statistical measures such as range, median, quartiles and interquartile range. As a result we can easily talk about anomalies.



Human Fieldwork…

State the title of your fieldwork enquiry in which **human** geography data were collected.

1. To what extent were the data collected useful in satisfying the original aim(s) of the enquiry? **[6 marks]**

Physical Fieldwork…

State the title of your fieldwork enquiry in which **physical** geography data were collected.

1. Explain why it was a suitable topic for a geographical enquiry. **[2 marks]**

1. Justify **one** primary data collection method used in your **physical** geography enquiry. **[3 marks]**

Fieldwork…

Suggest how **one** of your geographical enquiries could be improved. Make reference to your methods, results and conclusions. **[9 marks] [+ 3 SPaG marks]**

Exam Practice

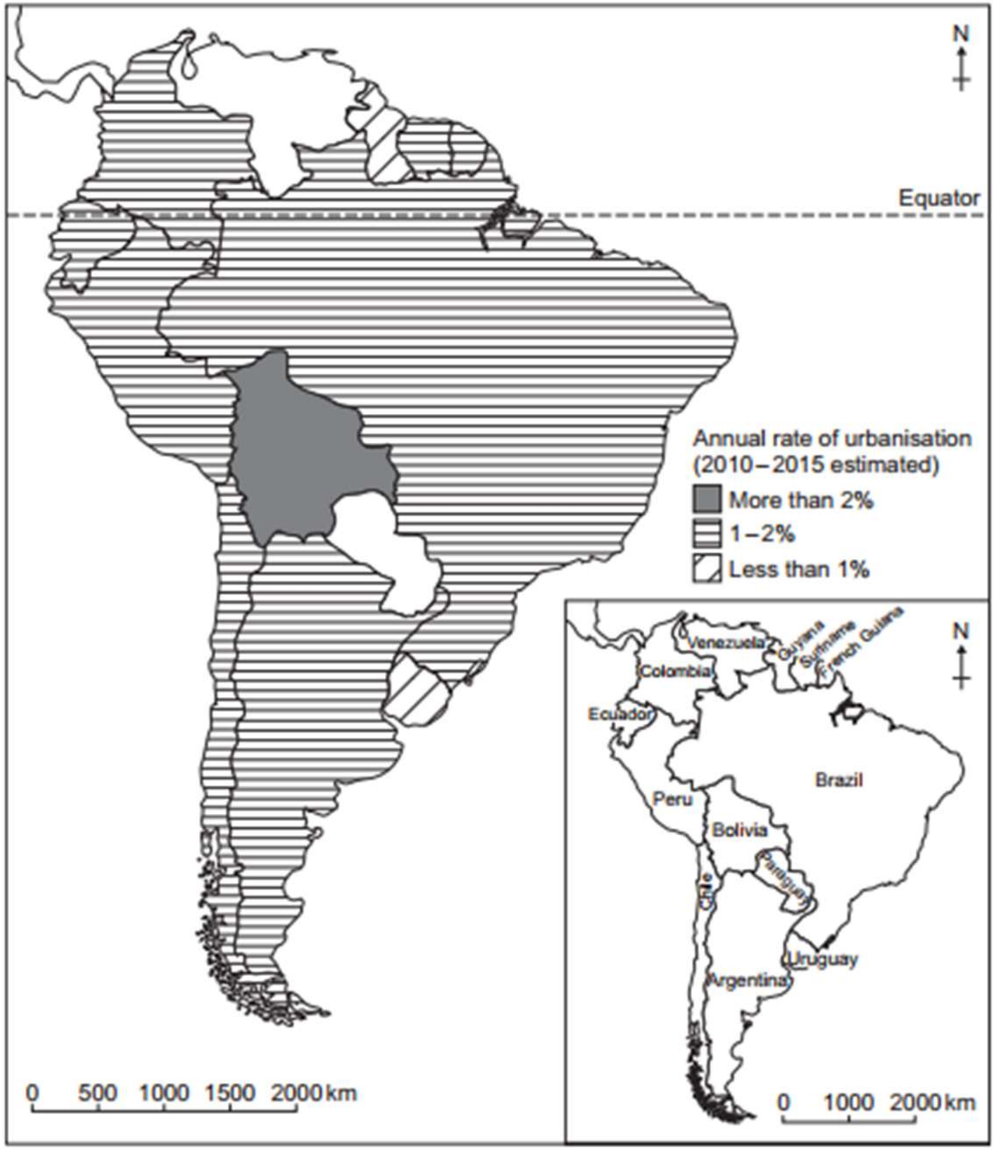
Study **Figure 3**, a map showing the annual rate of urbanisation of countries in South America (2010-2015 estimated).

a) Complete **Figure 3** Use the information below. **[2 marks]**
Paraguay = 2.5%
Venezuela = 1.7%

b) Name one country in South America with an annual rate of urbanisation less than 1%. **[1 mark]**

(c) What is the name of the type of map used in **Figure 3** to show the annual rate of urbanisation? **[1 mark]**

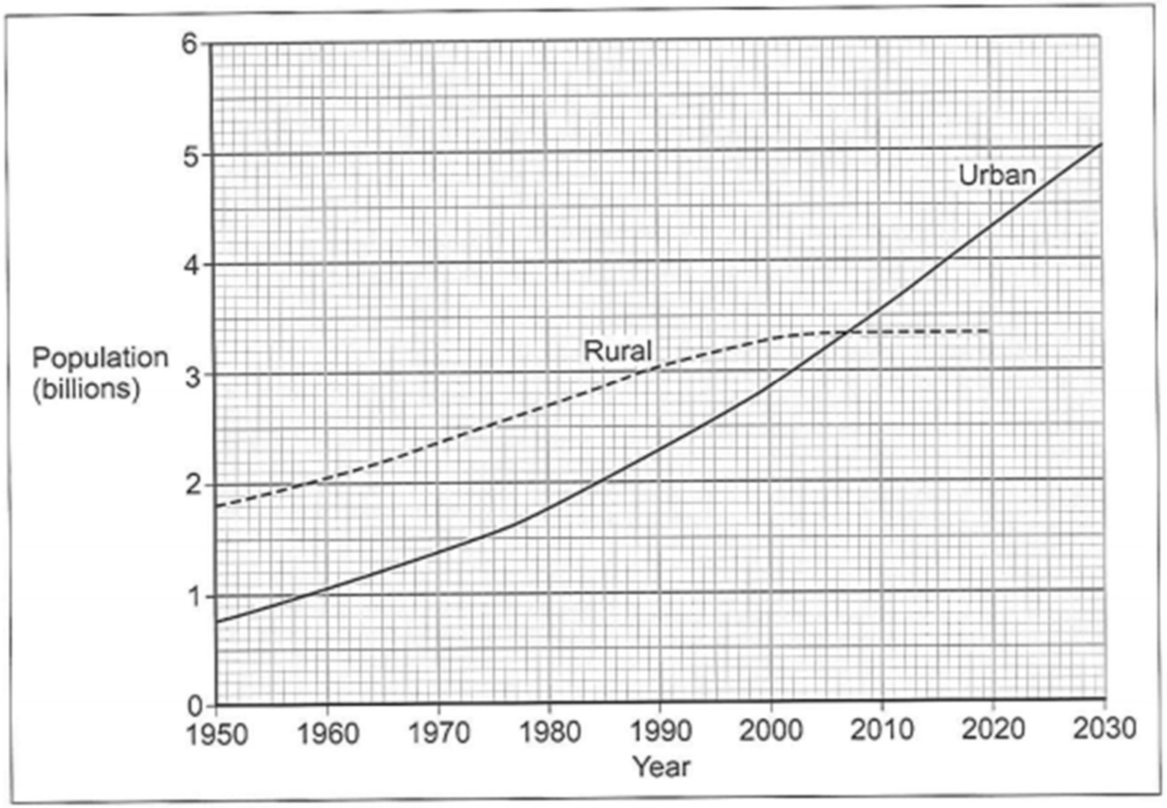
Figure 3



Exam Practice

Study **Figure 4**, a graph showing world rural and urban population between 1950 and 2030 (2010-30 estimated).

Figure 4



a) Complete **Figure 4** to show that the rural population in 2030 is estimated to be 2.3 billion **[1 mark]**

b) Approximately how many more people lived in rural areas compared to urban areas in 1965 **[1 mark]**

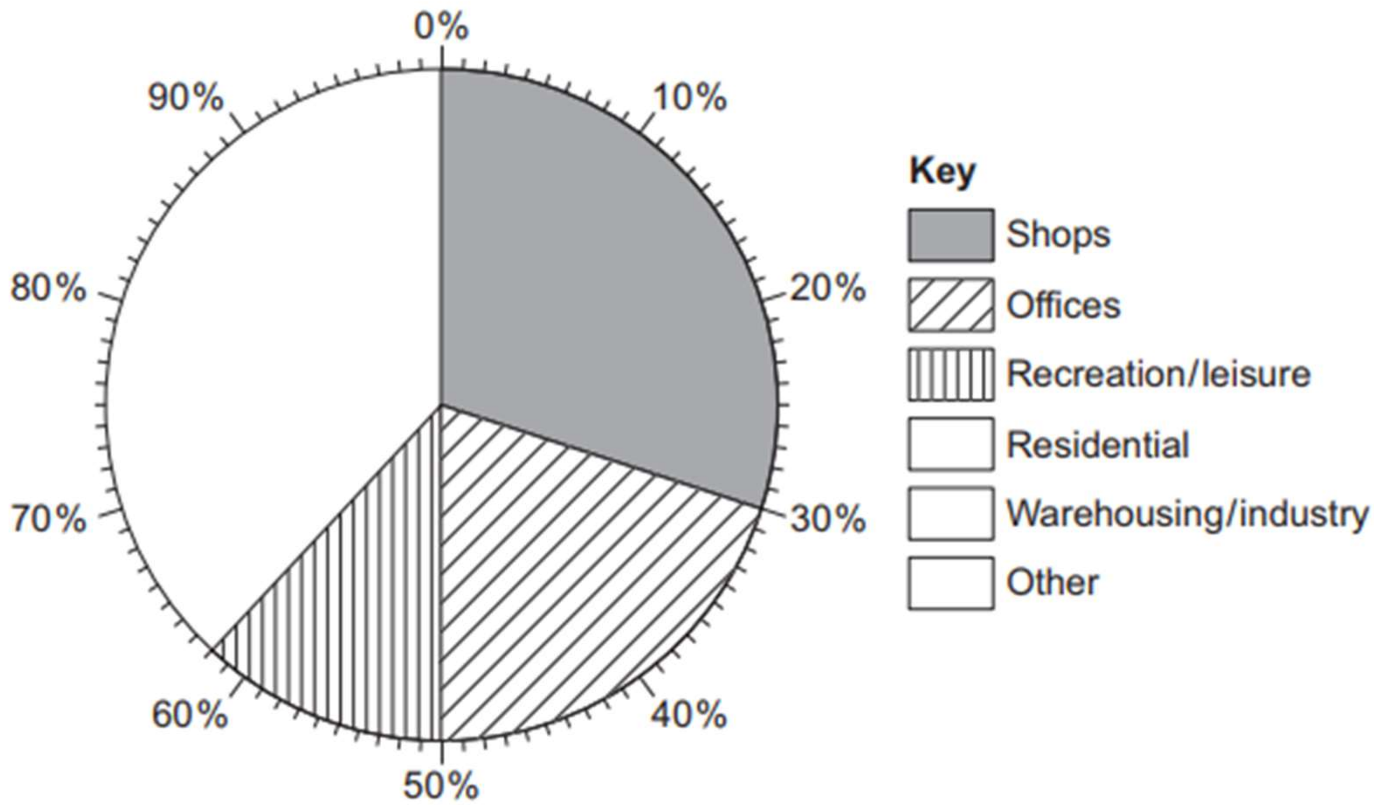
0.5 billion
1.0 billion
1.5 billion
2.5 billion

c) In which year did the rural and urban population have the same amount of people? **[1 mark]**

d) Describe the trend in urban population between 1950 and 2030 **[2 marks]**

Exam Practice

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%



Exam Practice

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

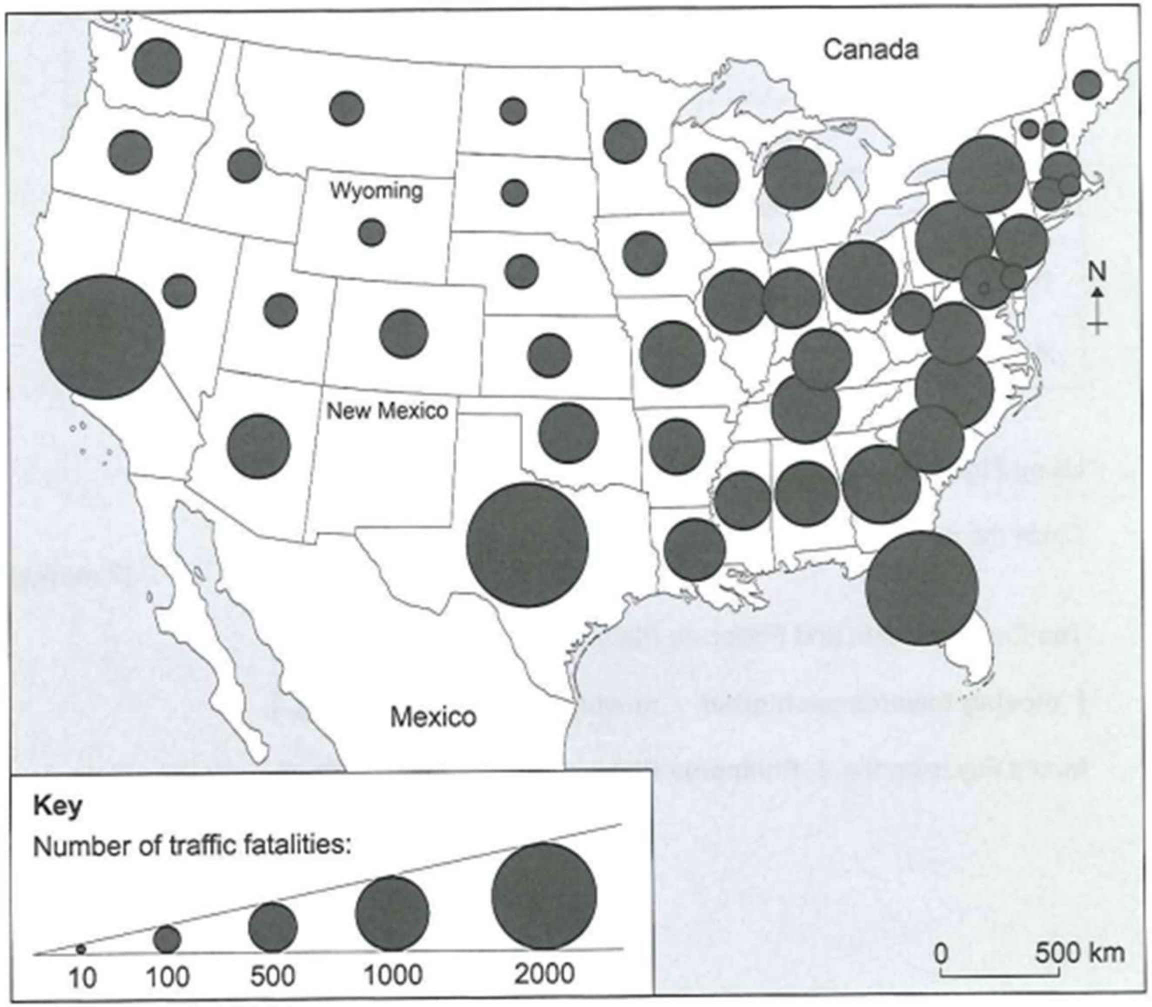
a) What is the name of the type of map used in **Figure 3**? **[1 mark]**

b) How many traffic fatalities were there in Wyoming in 2009? **[1mark]**

52
103
187
248
503

(c) Describe the distribution of traffic fatalities in the USA in 2009? **[4 marks]**

Figure 3



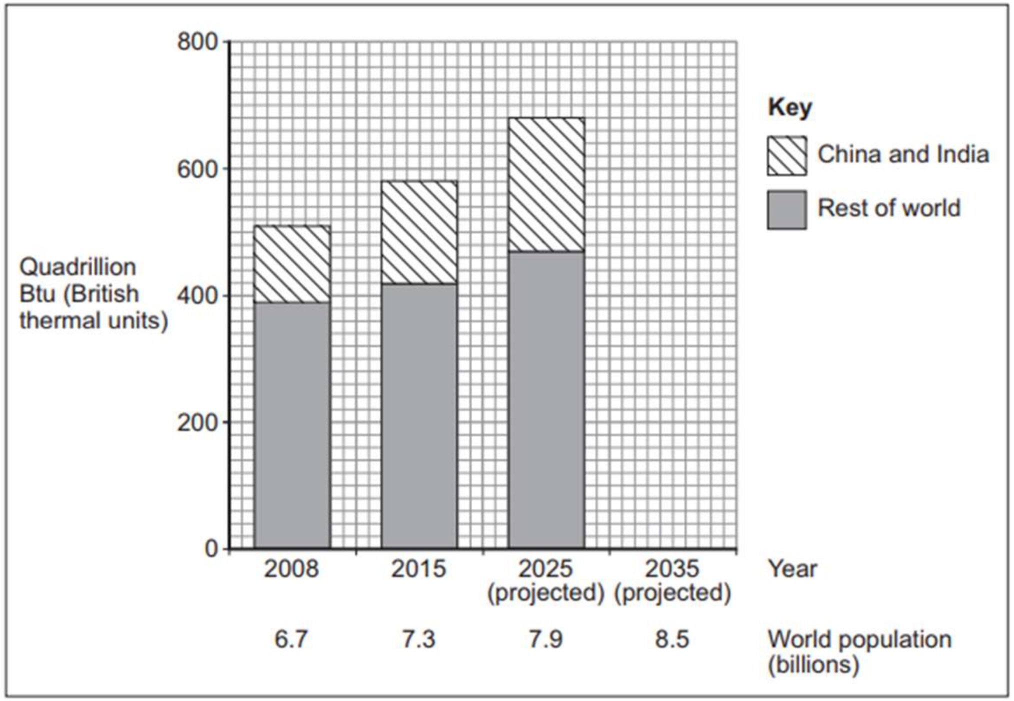
Exam Practice

Study **Figure 14**, a graph showing global energy consumption, 2008-2035.

a) Use the following data to complete **Figure 14**. **[2 marks]**

	Energy consumption in quadrillion Btu, 2035
Rest of world	520
China and India	240

Figure 14



b) What type of graph is being used in **Figure 14? [1 mark]**

b) What is the projected energy consumption for China and India in 2025? **[1 mark]**

b) Describe the trend in energy consumption between 2008 and 2035. **[2 marks]**

Exam Practice

The figures in the table below show river data collected at 8 sites on the River Dart. Site 1 is close to the source (or start) of the river.

Site	Width of river (m)	Depth of river (cm)	Gradient (°)	Speed (velocity) of water in metres per second
1	0.7	5	5	0.2
2	0.9	3	3	0.4
3	1.6	5	2	0.7
4	2.1	8	4	0.5
5	1.3	18	2	0.6
6	5.7	12	1	0.8
7	8.9	29	1	1.1
8	8.0	22	1	1.2

a) Calculate the mean width of the river. **[1 mark]**
b) Calculate the mode gradient. **[1 mark]**
c) Calculate the median depth. **[1 mark]**

Percentage change and percentiles

Percentage change is usually used in comparing things over period of time. E.g train ticket prices have risen 5% this year

A **percentile** is used to indicate a value within a data set. For example, the median is the 50th percentile / Upper quartile is the 75th percentile and lower quartile 25th percentile

Example

Work out the difference between the comparing numbers

Divide the difference by the original number

Multiply by 100 to give you a percentage. If the answer is a negative then it is percentage decrease,

E.G – Number of bus routes has increased from 24 to 31.

31-24=7   7/24 = 0.29   0.29x100 = 29%

Exam Practice

The number of people from a survey of 100 who thought Cabot Circus was a good shopping destination in 2015 was 80. Whereas in 2018 it was 29. What is the percentage change? Show your working **[2 marks]**

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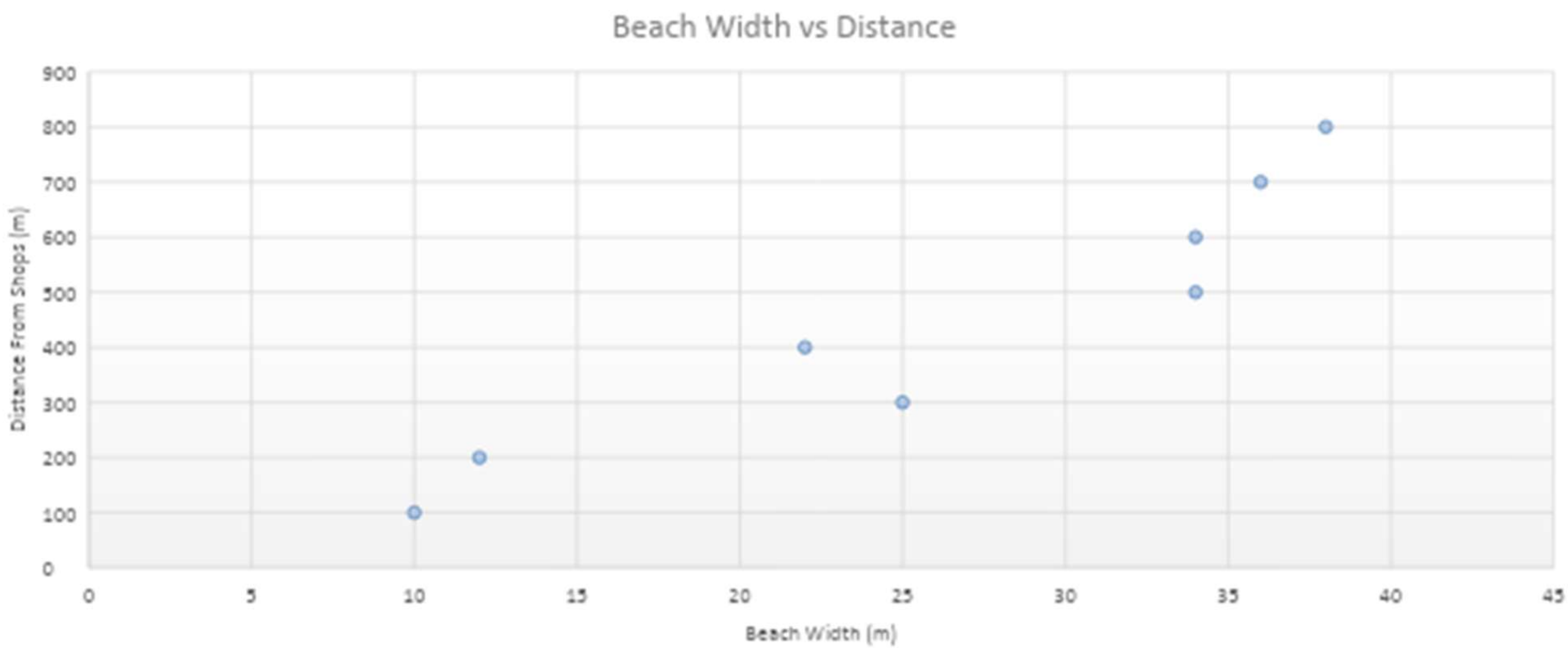
a) Calculate the LQ for the Gradient. **[1 mark]**
b) Calculate the UQ for the Gradient. **[1 mark]**
c) Calculate the IQR. **[1 mark]**

Exam Practice

The graph below is incomplete



a) Add the following piece of data to the graph **[1 mark]**
Distance – 350m   Width – 25m.

b) Plot on the line of best fit **[1 mark]**