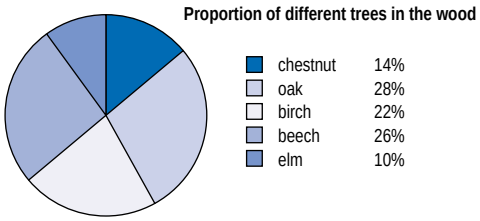
Pupils should be taught to:

Interpret diagrams and graphs, and draw inferences

As outcomes, Year 7 pupils should, for example:

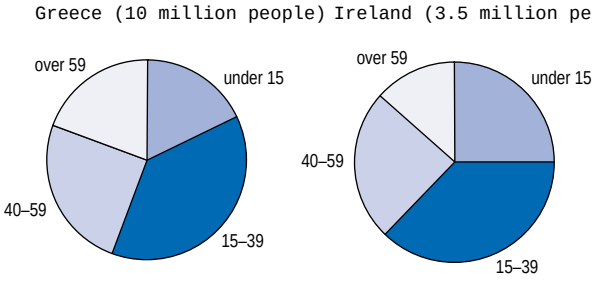
Interpret diagrams, graphs and charts, and draw inferences based on the shape of graphs and simple statistics for a single distribution. Relate these to the initial problem. For example:

- Interpret data in a pie chart from a newspaper, or generated by a **computer**. For example:
  a. Which species of trees grow best in the local wood?



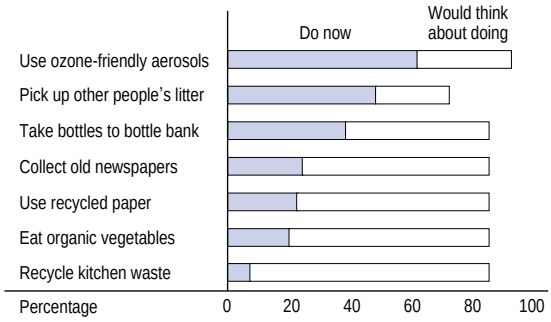
How many of each species of tree would there be in the wood if it had 600 trees?
Why do you think there are fewer elm trees in the wood than other species?

  b. These pie charts show some information about the ages of people in Greece and in Ireland. Roughly what percentage of people in Greece are aged 40–59?



Dewi says: 'The charts show that there are more people under 15 in Ireland than in Greece.'
Dewi is wrong. Explain why the charts do not show this.

- Interpret data in a simple compound bar chart.
For example:
In a survey people were asked about the things they did to help make the environment better. The bar chart below shows what people do now and what they would think about doing in the future.

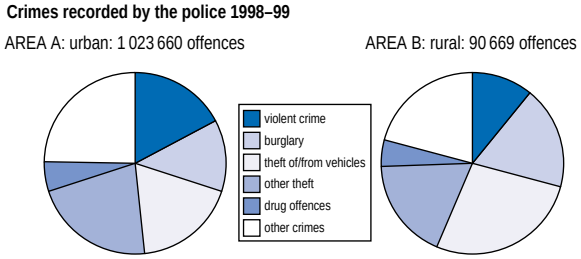


You are going to make a television advert about the environment. Choose two issues to be in your advert using the information in the chart. Explain how you chose each issue using *only* the information in the chart.

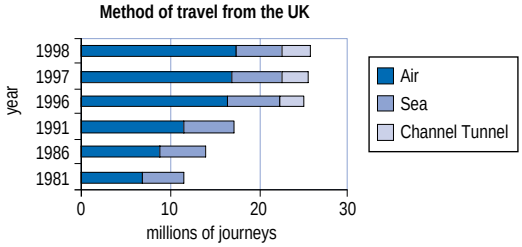
As outcomes, Year 8 pupils should, for example:

Interpret tables, graphs and diagrams, and draw inferences related to the problem; relate summarised data to the questions being explored. For example:

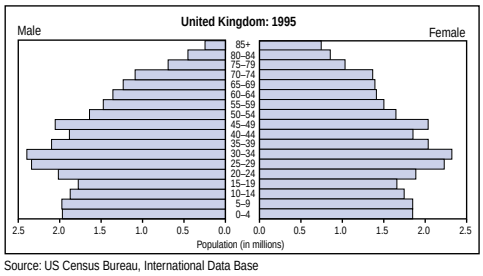
- Interpret pie charts. For example, discuss differences in crime patterns between two areas.



- Interpret data in a compound bar chart. For example:
  How has the method of travel changed over the last 20 years? Using the data in the graph, predict what the results will look like for this year.
  What about next year? In 10 years?



- Interpret data in a population pyramid. For example, discuss differences in the male and female populations of different countries.



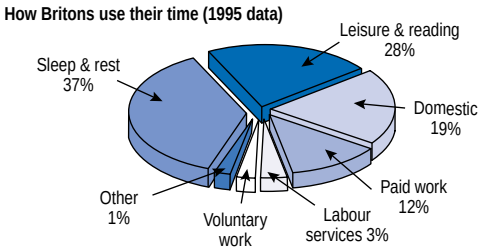
Source: US Census Bureau, International Data Base

Calculate simple statistics, such as the percentage of men and women over 70, to illustrate observations.

As outcomes, Year 9 pupils should, for example:

Interpret graphs and diagrams, and draw inferences from data representations to support and to cast doubt on initial conjectures. For example:

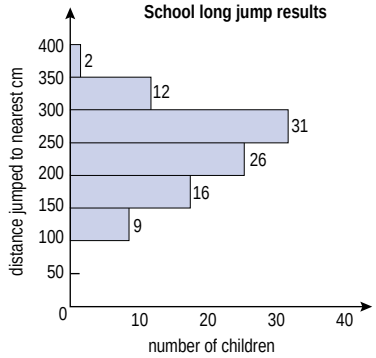
- Interpret pie charts, e.g. showing how British adults spend their time.



Source: *Economic Trends*, Office for National Statistics 1998

Criticise a claim that the pie chart shows that Britons spend too little time working. Argue that paid work amounts to 12% of $24 \times 7 = 20.16$ hours per week, which suggests that 1 in 2 British adults works about 40 hours a week, about right.

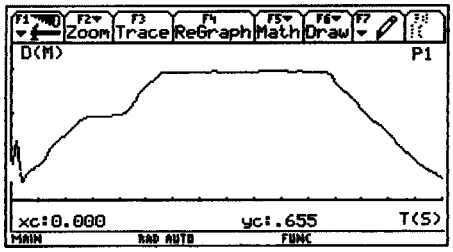
- Interpret frequency diagrams. For example:
  Here are the long jump results for a school.
  They are measured to the nearest centimetre, and classified in intervals $0 \leq d < 50$, $50 \leq d < 100$, etc.



a. Steve jumped 315 cm.
He says: 'Only two people jumped further than me.' Could he be correct? Tick the correct box, then explain your answer.
☐ Yes ☐ No

b. Ruby says: 'The median jump was 275 cm.'
She is not correct. Explain how the graph shows she is not correct.

- Interpret a distance–time graph, e.g. generated on a **graphical calculator** using a **CBR** (calculator-based ranger).



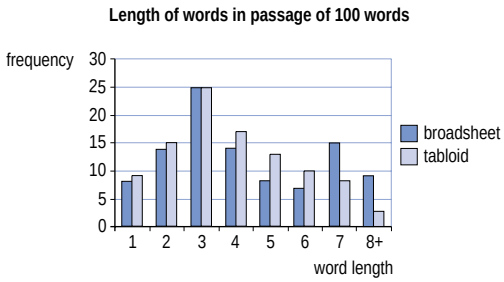
Pupils should be taught to:

Interpret diagrams and graphs, and draw inferences (continued)

As outcomes, Year 7 pupils should, for example:

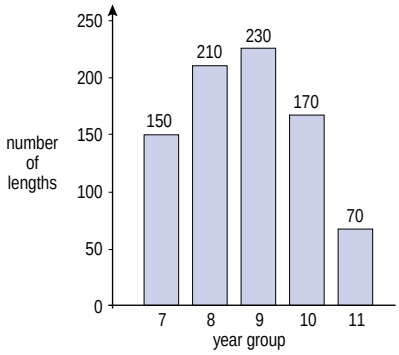
- Interpret a bar chart (discrete data). For example:

a. This chart shows the lengths of 100 words in two different newspaper passages. Compare the two distributions.



Observe that the differences are not great, but there may be slightly greater word length and variety of word length in the broadsheet newspaper.

b. A school has five year groups.
Eighty pupils took part in a sponsored swim.
Lara drew this graph.



Look at the graph.
Did Year 10 have fewer pupils taking part than Year 7?
Tick the correct box.

☐ Yes ☐ No ☐ Cannot tell

Explain your answer.

See Y456 examples (pages 114–17).

As outcomes, Year 8 pupils should, for example:

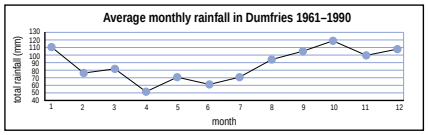
- Interpret data in a table from a secondary source. For example, describe the relationship between the number of cigarettes smoked and when smokers have their first cigarette of the day.

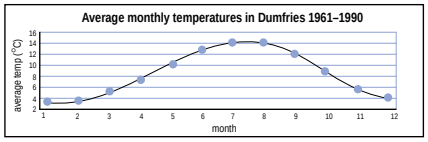
Time after waking first cigarette smoked	No. of cigarettes smoked per day		
	20 or more	10–19	0–9
Less than 5 minutes	31	12	2
5–14 minutes	28	16	3
15–29 minutes	19	17	6
30 minutes to 1 hour	14	23	12
1–2 hours	6	18	15
More than 2 hours	2	15	63

Source: *Smoking Statistics: who smokes and how much*, ASH

- Interpret line graphs, e.g. weather data.

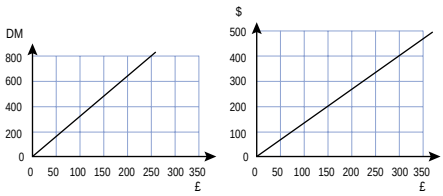
a.





When would you visit Dumfries? Why?
The driest month in Dumfries is normally April, when temperatures are around 7 °C. June is considerably warmer, and only a little wetter.

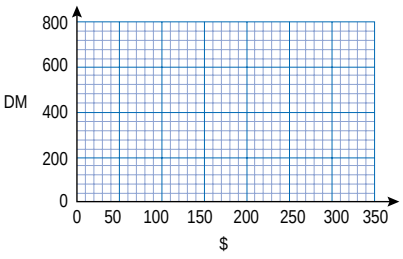
b. These two graphs convert pounds (£) to Deutschmarks (DM) and pounds (£) to dollars ($).



Use the graphs to complete the table.

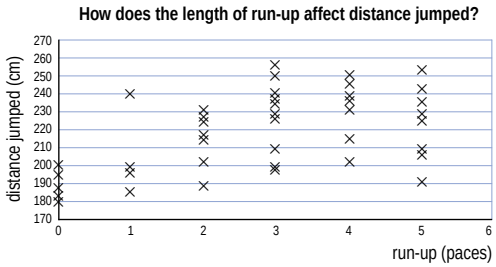
Number of £	Approximate number of DM	Approximate number of $
0	0	0
200		

Use the information in your table to draw a conversion graph for $ into DM.



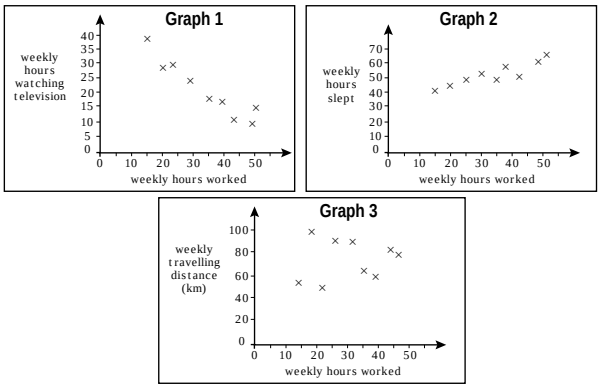
As outcomes, Year 9 pupils should, for example:

- Interpret scatter graphs, e.g. showing the effect of length of run-up on long jump distance.



Is there enough evidence to show that increasing the number of paces before take-off improves the distance jumped?

- Develop basic understanding of correlation. For example, some students plotted three scatter graphs.



a. What does graph 1 show about the relationship between the weekly hours spent watching TV and the weekly hours worked?
b. What does graph 2 show about the relationship between the weekly hours slept and the weekly hours worked?
c. What does graph 3 show about the relationship between the weekly travelling distance and the weekly hours worked?
d. One student works for 30 hours a week or more. Estimate the weekly hours spent watching TV and the weekly hours slept by this student. Explain how you decided on your estimates.

Analyse data to find patterns and exceptions, look for cause and effect, and try to explain anomalies.

- *In a study of engine size and acceleration times, observe that in general a larger engine size leads to greater acceleration. However, particular cars do not fit the overall pattern, perhaps because they are much heavier than average, or are built for rough terrain rather than normal roads.*

Recognise that in controlled scientific conditions it may be possible to deduce cause and effect, but that in statistical situations establishing a connection does not necessarily imply causality.