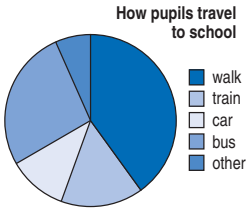
Pupils should be taught to:	As outcomes, Year 7 pupils should, for example:
Construct graphs and diagrams to represent data, on paper and using ICT	Use, read and write, spelling correctly: frequency diagram, bar chart, bar-line graph, pie chart…

Construct graphs and diagrams to represent data, on paper and using ICT, and identify key features. For example:

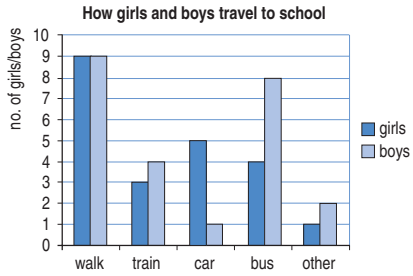
- **Pie charts** generated by **ICT**, for example:



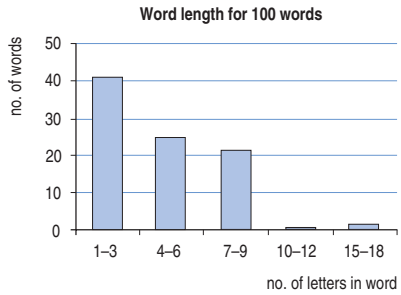
Know that the sizes of sectors of the chart represent the proportions in each category.

Link to percentages (pages 70–7).

- **Bar charts** for categorical data, for example:



- **Bar charts** for grouped discrete data, for example:



Choose suitable class intervals.
Know that the bars may be labelled with the range that they represent, but not the divisions between the bars.

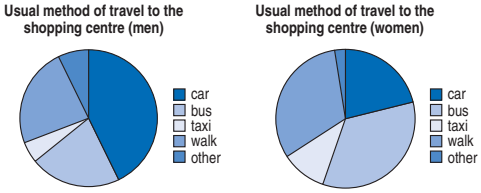
Know the conventions for marking the axes when the scale does not start from zero (see **page 172**).

As outcomes, Year 8 pupils should, for example:

Use vocabulary from previous year and extend to: population pyramid, scatter graph, distance–time graph, line graph…

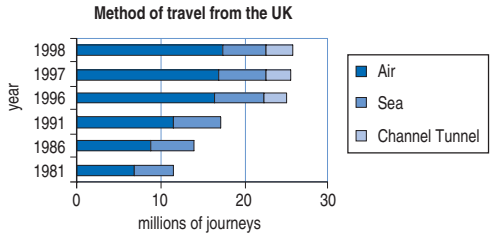
Construct graphs and diagrams to represent data, on paper and using ICT, and identify key features.

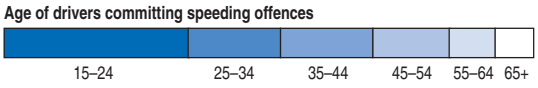
- **Pie charts:** Understand that pie charts are mainly suitable for categorical data. Draw pie charts using **ICT** and by hand, usually using a **calculator** to find the angles. For example, draw these graphs to compare shopping travel habits.



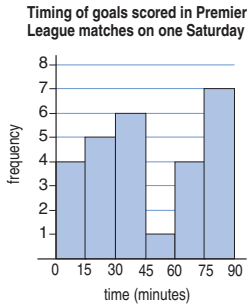
Link to percentages (pages 70–7).

- **Bar charts:** Compound bar charts allow both overall trends and changes in subcategories to be shown, for example:





- **Frequency diagrams** for a continuous variable, for example:



Choose suitable class intervals.
The bars in this graph represent intervals of $0 \le t < 15$ minutes, $15 \le t < 30$ minutes, etc.

Know that for continuous data the divisions between the bars should be labelled.

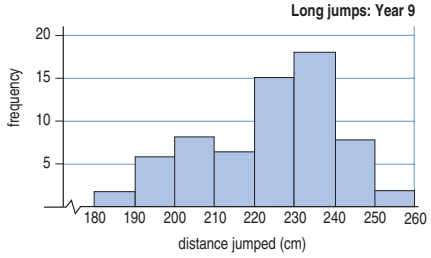
As outcomes, Year 9 pupils should, for example:

Use vocabulary from previous years and extend to: line of best fit, cumulative frequency graph…

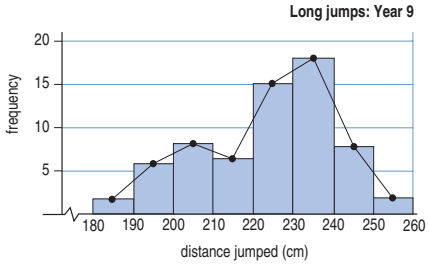
Construct graphs and diagrams to represent data, on paper and using ICT, and identify key features.

Appreciate that:
- A table usually gives all the data that can be retrieved.
- A graph, chart or diagram representing the data highlights particular features that a table does not.
- Data shown in a graph, chart or diagram are often in an aggregated form that does not allow the original data to be extracted.
- Calculated statistics are representative values of data sets.

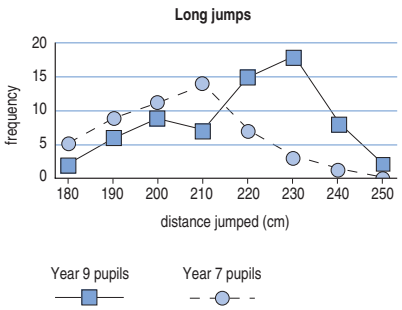
- **Frequency diagrams and polygons,** e.g. in this graph bars represent intervals of $180 \le d < 190$, etc.



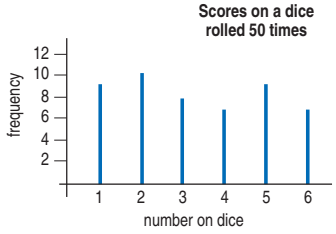
Use frequency polygons, for example:



Use superimposed frequency polygons rather than bar charts to compare results, for example the distances jumped by pupils in Year 7 and pupis in Year 9.



Pupils should be taught to:	As outcomes, Year 7 pupils should, for example:
Construct graphs and diagrams to represent data, on paper and using ICT (continued)	• **Bar-line graphs** for a discrete variable, for example:

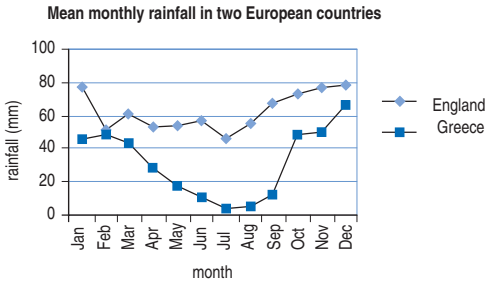


Know that:
- The length of the bar represents the frequency.
- What is being counted or measured (the independent variable) is placed on the horizontal axis, and the count or measure (the dependent variable) on the vertical axis.
- It is not appropriate to join the tops of the bars.

See Y456 examples (pages 114–17).

As outcomes, Year 8 pupils should, for example:

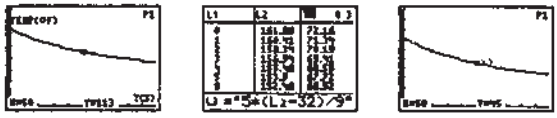
- **Line graphs** comparing two sets of data, for example:



  Know that it can be appropriate to join the points on the graph in order to compare trends over time.

- **Line graphs** comparing continuous data, for example:

  Use a **temperature probe** and **graphical calculator** to compare cooling rates, e.g. to model the problem 'Why do penguins huddle together to keep warm?'

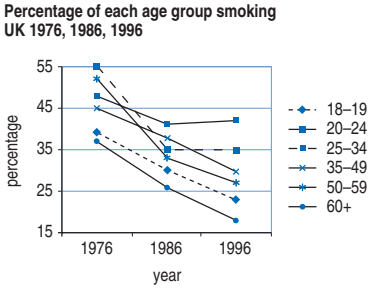


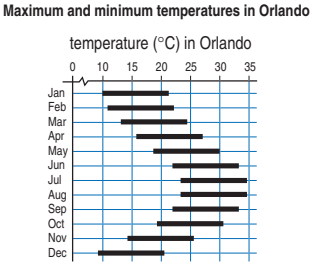
  Understand that every point on the cooling curve has a meaning.

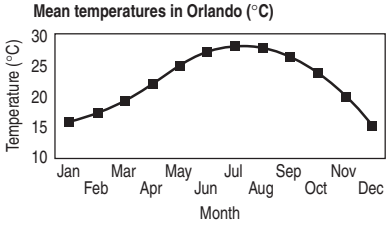
Link to graphs of functions, including distance–time graphs (pages 172–7).

As outcomes, Year 9 pupils should, for example:

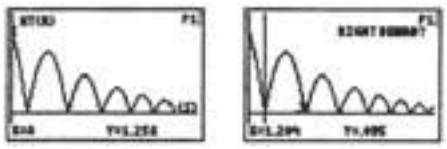
- **Line graphs** comparing several sets of data, for example:







Distance–time graph for a bouncing ball recorded on a **graphical calculator** using a **motion detector**

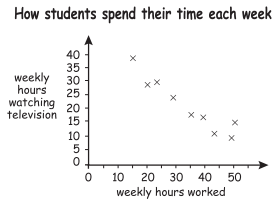


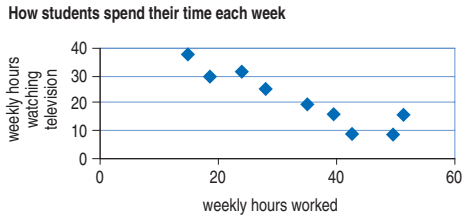
Link to graphs of functions, including distance–time graphs (pages 172–7).

Pupils should be taught to:	As outcomes, Year 7 pupils should, for example:
Construct graphs and diagrams to represent data, on paper and using ICT (continued)	

As outcomes, Year 8 pupils should, for example:

- **Scatter graph** for continuous data, two variables, for example to show weekly hours worked against hours of TV watched (plotted by hand and using **ICT**).

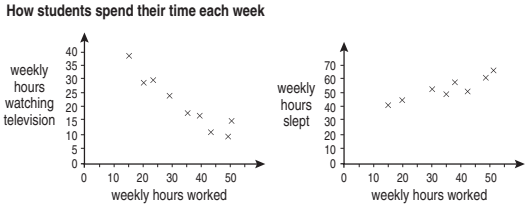




Link to two-way tables (page 254–5).

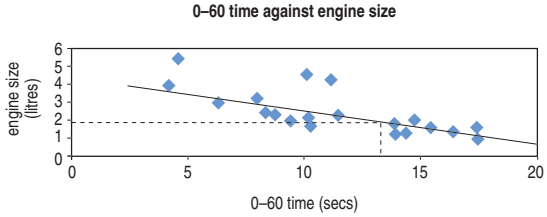
As outcomes, Year 9 pupils should, for example:

- **Scatter graphs**, for example:



Use the two scatter graphs above to suggest a relationship between the amount of TV a pupil watches and the number of hours he or she sleeps.

- **Draw a line of best fit,** by eye or using a **graphical calculator** or **spreadsheet**, e.g. engine size against 0–60 mph acceleration times.



Find the mean point through which the line should pass.

Predict a 0–60 mph time of about 13 seconds for a new car with a 1.8 litre engine.

- This table shows the heights jumped in a field test by different BMX bikes, each carrying the same rider.

Mass (kg)	Height (cm)
8.0	26.8
8.5	26.4
9.0	26.1
9.5	25.7
10.0	25.0
10.5	24.8
11.0	24.3

a. Draw a scatter graph to show the results.
b. Draw a line of best fit.
c. Estimate the height jumped by a bike weighing 9.7 kg.

Understand that:
- A prediction based on a line of best fit is an estimate and may be subject to substantial error.
- A line of best fit indicates an estimated relationship which may not mean anything in practice.