# Interpreting and communicating

- Interpreting more complex graphs and diagrams
- Testing hypotheses
- Comparing two or more distributions

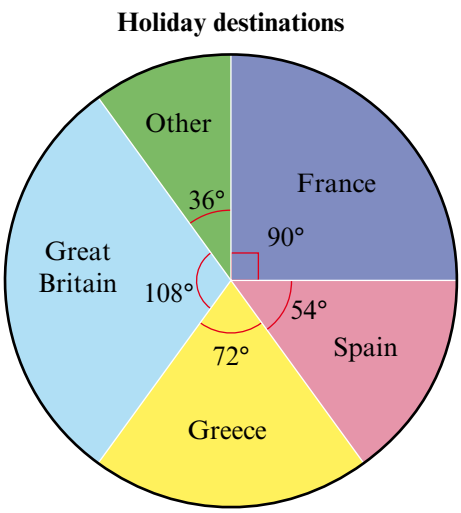
Keywords

You should know

explanation 1 online

**1** Dinesh asked his friends where they went on holiday last year.

The pie chart shows the results of his survey.



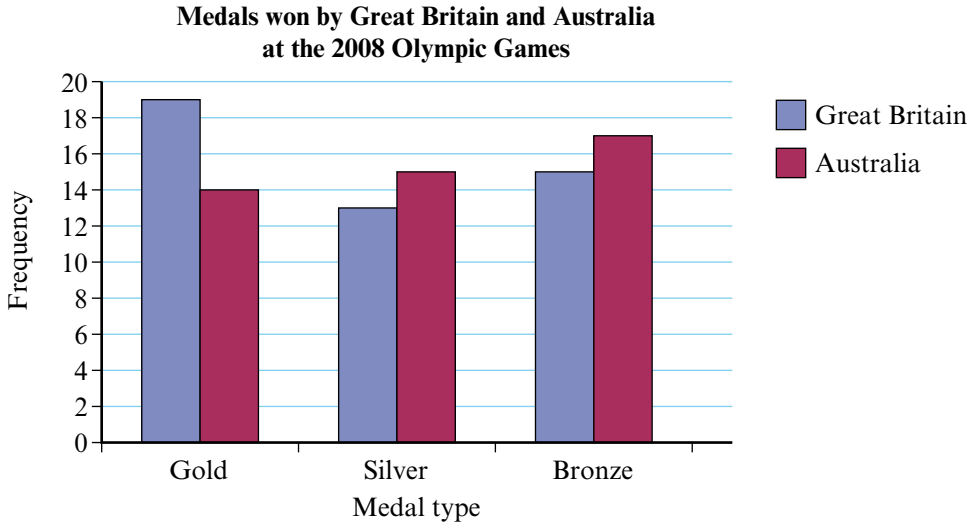

**a** What fraction of the people surveyed went to France?

**b** Which country was most frequently chosen for holidays?

**c** Dinesh says 'More people went to Spain than France'.
Is Dinesh correct? Give a reason for your answer.

**d** 30 people went to France for their holiday.
How many people took part in the survey?

**2** The dual bar chart shows the numbers of medals won by Great Britain and Australia in the 2008 Olympic games.



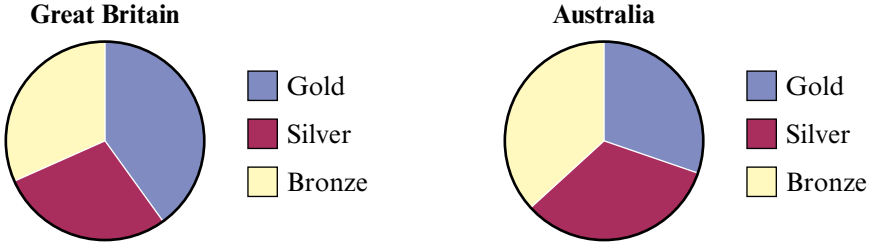

**a** How many silver medals did Great Britain win?

**b** How many gold medals did Australia win?

**c** Which country won more bronze medals?

**d** Tony says 'Australia won more medals in total than Great Britain'. Is Tony correct? Give a reason for your answer.

Maria thinks pie charts would be better to display the data.
She draws two pie charts.




**e** Which type of graph shows the results more clearly? Explain your answer.

**3** Sasha surveyed 36 girls and 36 boys to find out which their favourite subject is from English, maths, science, history and geography.
The table shows how many girls and how many boys chose each subject.

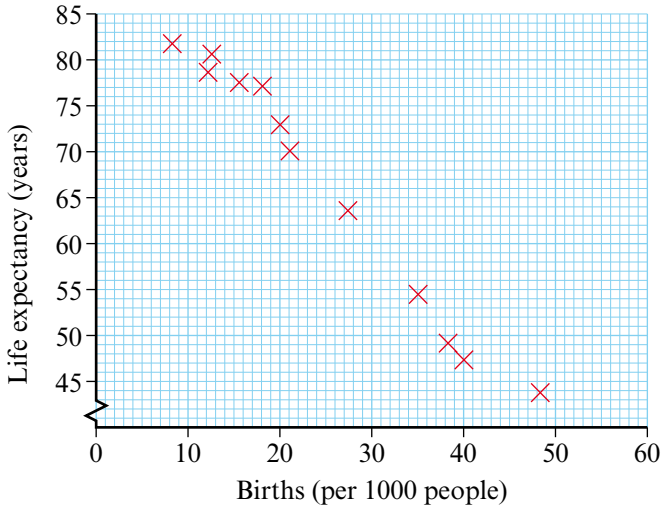
| Subject | Number of girls | Number of boys |
|---|---|---|
| English | 9 | 6 |
| Maths | 7 | 11 |
| Science | 5 | 9 |
| History | 8 | 4 |
| Geography | 7 | 6 |

**a** Sasha wants to illustrate the results of her survey using a graph.
She wants to be able to show the popularity of the different subjects.
What type of graph should she draw? Give a reason for your answer.

**b** Sasha's English teacher wants to use a graph to show that more girls than boys prefer English. What type of diagram should she draw?
Explain your answer.

explanation 2a explanation 2b

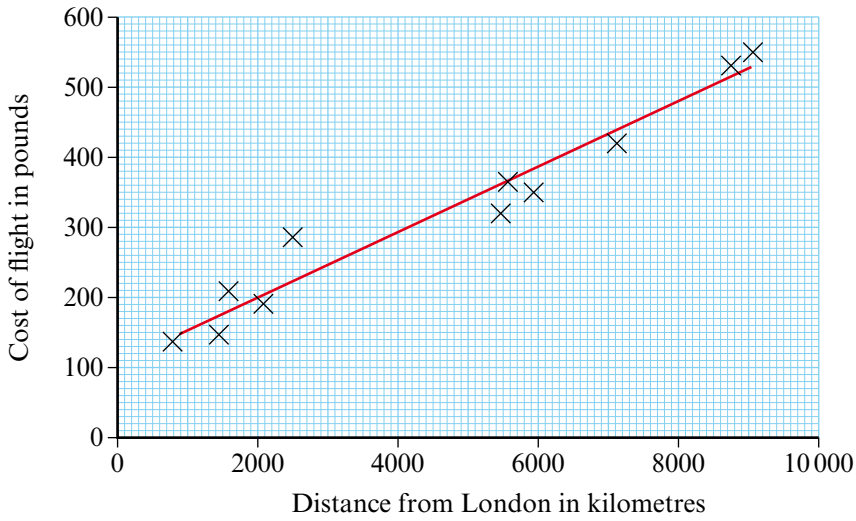
**4** Anya is doing a geography project. Her hypothesis is 'The higher the birth rate of a country, the lower the life expectancy is in that country'. She collects some data from the internet. She uses her data to draw a scatter graph.




Is Anya's hypothesis correct? Explain how you use the information shown in the graph to reach your conclusion.

**5** Alan wants to find out if there is a relationship between the distance travelled during an aeroplane flight and the cost of the flight.

He collects some data from an airline's website then uses the data to plot a scatter graph. He draws a line of best fit on his graph.




**a** How many of the flights were shorter than 5000 kilometres?

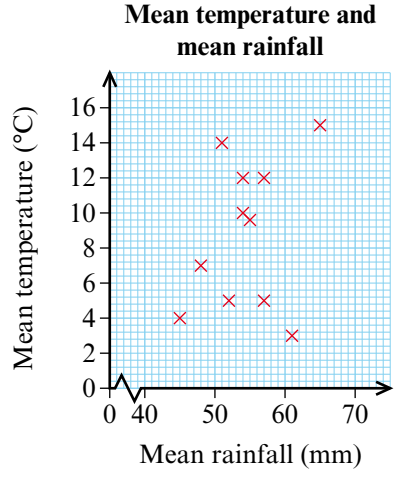
**b** How many flights cost more than £400?

**c** One of the points represents a flight from London to Miami.
Miami is approximately 7100 km from London.
Approximately how much did this flight cost?

**d** Alan's hypothesis is 'The greater the distance travelled, the more the flights cost'. Is Alan's hypothesis correct? Use information shown in the scatter graph to give reasons for your answer.

**6** Paul lives in York. His hypothesis is 'The more it rains, the lower the temperature is'.
In order to see if his hypothesis is correct he collects some data about the weather in York.
The graph shows this information.

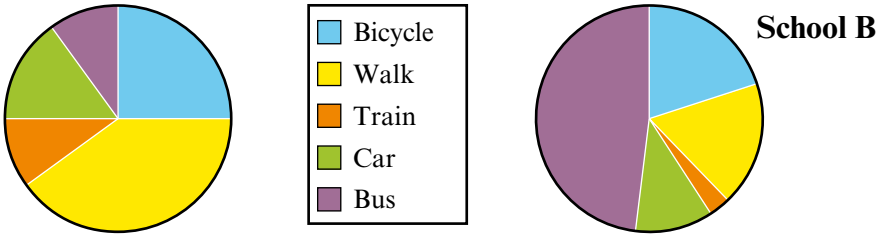
Is Paul's hypothesis correct?
Explain how you used the information shown in the graph to reach your conclusion.



explanation 3a | explanation 3b | explanation 3c | explanation 3d

**7** The pie charts show how all pupils travel to two different schools.

**School A**




**School B**

**a** What fraction of pupils from school A travel to school by bicycle? Give your fraction in its simplest form.

**b** What fraction of pupils from school B travel to school by bicycle? Give your fraction in its simplest form.

**c** Emily says that more pupils cycle to school A than school B. Is Emily correct? Give a reason for your answer.

**d** How do most pupils travel to school A?

**e** How do most pupils travel to school B?

**f** One of the schools is out in the country and the other is in a town. Which school is most likely to be in a town? Give a reason for your answer.

**8** Two classes took the same test. There are 20 pupils in each class.

The stem and leaf diagrams show their results.

**Class A**

| | | | | |
|---|---|---|---|---|
| 0 | | | | |
| 1 | 0 | 2 | 2 | 6 |
| 2 | 1 | 4 | | |
| 3 | 4 | 8 | 9 | |
| 4 | 1 | 5 | 5 | |
| 5 | 1 | 2 | 6 | 7 |
| 6 | 0 | 1 | 2 | 4 |

**Class B**

| | | | | |
|---|---|---|---|---|
| 0 | 7 | | | |
| 1 | 6 | 7 | 8 | |
| 2 | 3 | 5 | 8 | |
| 3 | 1 | 3 | 4 | 4 |
| 4 | 2 | 6 | 6 | |
| 5 | 7 | 8 | | |
| 6 | 2 | 4 | 4 | 5 |

Key: 3|5 represents a score of 35

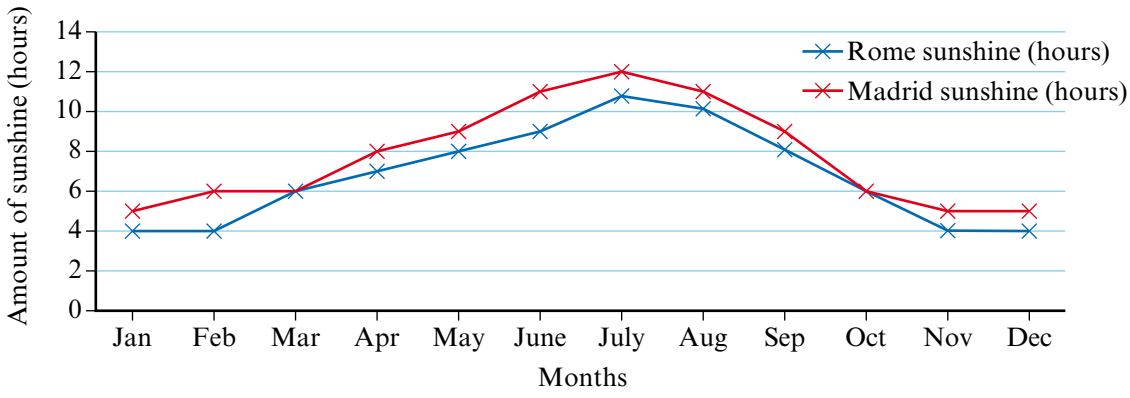
**a** Find the range for class A and the range for class B.

**b** Find the median result for class A and the median result for class B.

**c** Calculate the mean result for class A and the mean result for class B.

**d** Which class performed better in the test? Justify your answer using the medians and means worked out in parts **b** and **c**.

**9** The line graphs show the mean numbers of hours of sunshine per day in Rome and in Madrid each month.

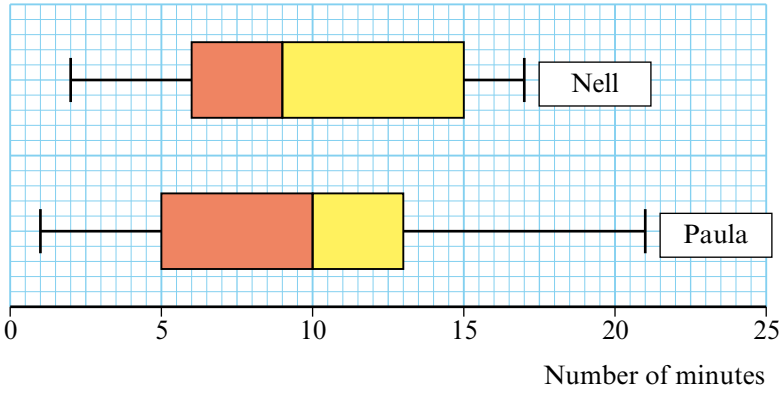



**a** What was the mean number of hours of sunshine per day for Rome in August?

**b** In which two months do Rome and Madrid both have a mean of 6 hours of sunshine per day?

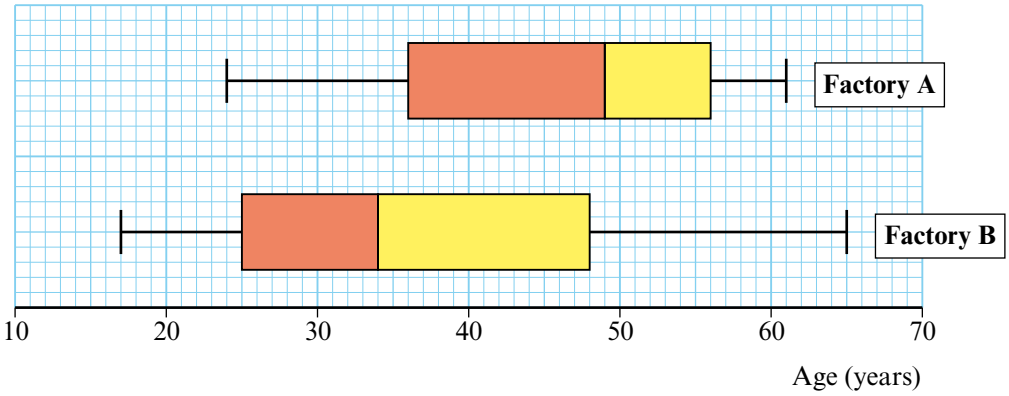
**c** Which city has more hours of sunshine in a year?
Give a reason for your answer.

**10** Nell and Paula both record the number of minutes they spend talking on their mobile phone each day for a fortnight.
Their results were used to draw two box plots.




Compare the times that the girls spent talking on their mobile phones.

**11** The box plots show information about the ages of the workers in two factories.




Compare the ages of the workers in the two factories.

**12** These stem and leaf diagrams show the amount, correct to the nearest pound, that some customers spent in two different restaurants.

**Restaurant A**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 4 | 6 | 7 | 8 | 8 | 9 | |
| 2 | 0 | 0 | 2 | 4 | 6 | 7 | 7 |
| 3 | 1 | 2 | 2 | 2 | 3 | 4 | 4 |
| 4 | | | | | | | |

**Restaurant B**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | 8 | 9 | | | | | | |
| 2 | 3 | 5 | 7 | 7 | 8 | | | |
| 3 | 2 | 4 | 4 | 5 | 7 | 7 | 8 | 8 |
| 4 | 0 | 1 | 2 | 5 | 6 | | | |

Key: 3|1 represents a spend of £31

**a** Work out the median and range for each restaurant.

**b** Use the values you have worked out in part **a** to compare the prices in the two restaurants.