Statistical investigations

- Writing a hypothesis
- Planning a statistical investigation to solve a problem

Keywords

You should know

explanation 1a explanation 1b explanation 1c explanation 1d

1 Some pupils are investigating problems.

i Write a hypothesis for each problem.

ii Would primary or secondary data be used in each investigation?

a Jenny wants to compare the heights of boys and the heights of girls.

b Anil wants to investigate whether teachers or pupils are better at mental arithmetic.

c Pat wants to investigate the relationship between the size of a country's population and the area of the country.

d Sam wants to compare the weather in New York with the weather in London.

e Morgan wants to investigate what happens to the value of cars as they get older.

f Ahmed wants to investigate the relationship between the time pupils spend watching television and their GCSE results.

g Geoff wants to investigate whether boys or girls are better at maths.

h James wants to investigate the amount of time boys and girls spend playing sport outside school.

2 Data is going to be collected to test these hypotheses.

For each hypothesis write this information.

i A description of the data that could be collected.

ii Where the data will come from.

a Taller people are heavier than shorter people.

b It is hotter in Egypt than in Crete.

c The taller you are, the quicker your reaction time.

d The average length of television programmes is 30 minutes.

e Pupils who watch more television spend more time on the internet.

f The closer a pupil lives to school, the more homework they do.

g Girls read more books than boys.

3 Write down the following for each of these problems.

i A suitable hypothesis.

ii A description of the data that will be needed.

iii The source of the data and how it will be collected.

a Are more expensive newspapers less popular?

b Does it rain more in Newcastle or Penzance?

c Does a football team with more foreign players win more matches?

d Do taller children have longer arms?

explanation 2a | explanation 2b | explanation 2c | online

4 Design data collection sheets for the following surveys or experiments.

a The total scored when two dice are rolled together.

b The number of words in the sentences of a book.

c The heights of pupils in your maths class.

d The shoe sizes of pupils in your maths class.

e The number of vehicles in the school car park at different times of the day.

5 Sam designs a questionnaire.

He gives it to his friends to fill in.

Sam's questionnaire

1 What type of mobile phone do you own?

Nokia ☐ Samsung ☐

2 How would you rate your mobile phone?

Average ☐ Good ☐ Excellent ☐

3 How much do you spend each week using your mobile phone?

0–£2 ☐ £2–£4 ☐ £4–£6 ☐ £6 or more ☐

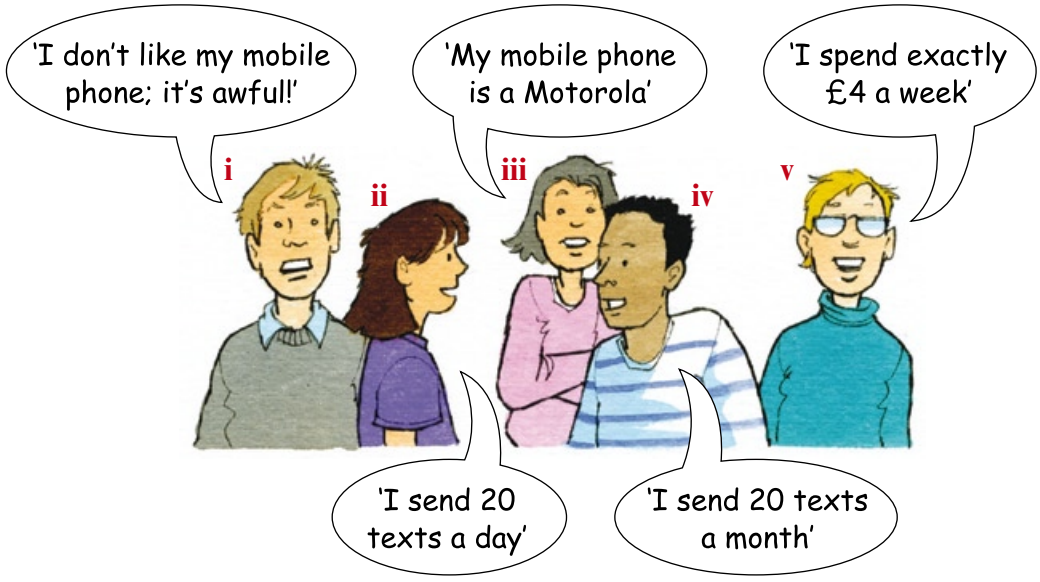
4 How many text messages do you send?

0–10 ☐ 11–20 ☐ 21–30 ☐ 31–40 ☐

Some of his friends cannot fill in the questionnaire.

a Explain why each of Sam's friends can't fill in the questionnaire.

b Rewrite the questionnaire so that everyone can fill it in.



6 Design a questionnaire for each of these investigations.

Write at least two questions for each.

Don't forget to include response boxes.

a Harry wants to find out how people use the local library.

b Jemilla wants to find out what her friends think about school dinners.

c Meg wants to find out how people use the local sports centre.

7 Choose one of the following problems and plan your own investigation.

i Write a hypothesis.

ii Plan your investigation.

iii Explain how you will collect your data and how much data you will collect.

iv Design a questionnaire or data collection sheet.

a Do children who watch more television do less homework?

b Do people who run faster have longer legs?

c Are children quicker at writing text messages than adults?

d Do pupils in Year 11 get more homework than pupils in Year 7?