1.4 Scientists present their data accurately

Student worksheet answers (pages 8–9)

Representing and interpreting results

1 Consider the following set of data:

a What is the average age of students?

((6+13+13+14+12+13+15+14+12+13+13+15)÷12)=12.75 = 13

b What does the average represent?

the age of the majority of students

c Which value is the outlier?

age of 6

d What is an outlier?

a value that is far away from the main group of data

e What is the median?

13

f What does the median represent?

the middle value

g What is the mode?

13

h What does the mode represent?

The most common number

2 Graph the data of the temperature rise of boiling water in a scatterplot on the graph paper provided below.



3 What is the relationship between the data in the graph you drew in question 2?

high positive correlation for 80 secs then decreases over time

4 Match the graph with the relationship within its data:



EXTEND YOUR UNDERSTANDING

5 An experiment was conducted to determine how far a wind-up toy truck would move with different weights in its flat tray. The following data were obtained: with no weights the car moved 1 m, with 50g of weight the car moved 90 cm, with 100 g of weight the car moved 80 cm, with 150 g of weight the car moved 70 cm, with 200 g of weight the car moved 60 cm, and with 250 g of weight the car moved 50 cm.

a Place the data into the results table below.

|  |  |
| --- | --- |
| Weight (g) | Distance travelled (cm) |
| 0 | 100 |
| 50 | 90 |
| 100 | 80 |
| 150 | 70 |
| 200 | 60 |
| 250 | 50 |

b Graph the data onto graph paper below.



c What is the average distance that the car travelled?

((100+90+80+70+60+50)÷6) = 75cm

d What does the average represent?

the distance of the majority of the runs

e Is there an outlier? How do you know?

No, because no value is dramatically different from others.

f What is the relationship between data points on the graph?

perfect negative correlation

g Calculate the slope of the line using the formula slope = rise ÷ run.

-10 ÷ 50 = -0.2

h Using the slope of your line, calculate how far the car will travel with 400g of weight:

y = mx + c, m= -2 and c = y intercept = 100

y = mx + c = 0.2 x 400 + 100 = 20cm The car will travel 20cm

i What is the minimum weight necessary for the car to be unable to move? That is, how much weight should you add to make it immobile?

y = mx + c, therefore when y=0 the car is immobile

y = mx + c, 0 = -2 x x + 100, -100 = -0.2x, x = -100÷-0.2, 500g The car will not move under 500g weight

j What is the independent variable?

weight on top of the car

k What is the dependent variable?

the distance travelled by the car

l What is the relationship between the dependent and independent variables?

As the weight increases, the distance decreases.