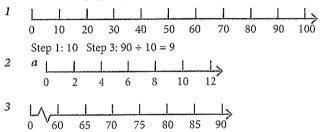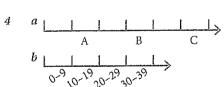## 1 Types of data

1 *a* experiments *b* numbers *c* months *d* half, seconds *e* can't, divided, midday, blue *f* order, arrange *g* data, small *h* size, time

2 quantitative discrete – *b*, interval categorical – *e*, quantitative continuous – *d*, nominal categorical – *c*, ordinal categorical – *a*

2 Types of graphs

1 *b* Pie – Used to show a set of percentages or fractions that have large differences in the size of the proportions. Graph has no *x*-axis or *y*-axis. Bar – Used to show a set of percentages or fractions that have small differences in the size of the proportions. Column – Used to show categorical data with a quantitative continuous y axis variable. Histogram – Used when the dependent variable is a count of how often something occurs, also known as a *frequency*. Line – Used to show a trend between unrelated variables, usually over time. Scatter – Used to find a relationship between an independent and dependent variable.

2 pie, column, histogram, bar

3 *a* pie *b* histogram *c* column *d* scatter

4 *a* column *b* bar

5 4a – Major planet, 4b – Household energy use

6 *a* scatter *b* histogram *c* line

3 Drawing graph scales

1

```
|___|___|___|___|___|___|___|___|___|___|___>
0   10  20  30  40  50  60  70  80  90  100
```

Step 1: 10   Step 3: 90 ÷ 10 = 9

2 *a*
```
|___|___|___|___|___|___|___>
0   2   4   6   8   10  12
```

3
```
|ᐱ_|___|___|___|___|___|___>
0  60  65  70  75  80  85  90
```

4 *a*
```
|___|___|___|___|___|___|___>
        A       B       C
```

b
```
|___|___|___|___|___|___>
  0-9  10-19 20-29 30-39
```
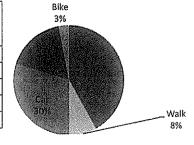
4 Quick quiz

1 *a* data *b* quantitative *c* categorical *d* continuous *e* discrete *f* nominal *g* ordinal *h* interval

2 *a* categorical nominal *b* quantitative discrete *c* categorical interval *d* quantitative continuous

3 *a* column *b* scatter *c* pie/bar *d* line *e* histogram

4 *a* bar, pie, column, histogram *b* bar

5
```
|ᐱ_|___|___|___|___|___>
0  65  70  75  80  85  90
```

5 Pie graphs

1

Percentage of each method of travel to school

Method of travel	Percentage of students (%)	Angle (°)
Bus	42	151
Walk	8	29
Car	30	108
Train	17	61
Bike	3	11

6 Bar graphs

1 *a* 25% *b* 25%

3

a

Ingredient	Mass (g)	Percentage (%)
pastry	95	45
sugar	15	7
apple	80	38
butter	20	10
Total	210	100

Ingredients in apple pie

7 Column graphs and histograms

1 Each axis has a title, graph has a title, equal spaces between the columns, equally spaced scale on *y*-axis, first column of data on the horizontal axis, second column of data on the vertical axis, vertical axis title has units.

3 *a* Spaces between columns, 90–94 age group incorrectly plotted, no graph title, no horizontal axis title, no units (00's of people) for vertical axis. *b* 65–69 *c* Very few people are diagnosed with lung cancer at younger ages *d* 25–29 and 30–34
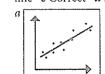
4 *b* 2 *c* 6 *d* 82

8 Line and scatter graphs

1 *A* graph title *B* units for axis title *C* × for each plotted point *D* ruled line joining each point *E* evenly spaced scales *F* ends of axes have arrowheads *G* scale starts at 0 *H* graph takes up maximum space *I* axis title

2 *a* 10 minutes *b* After 5 minutes *c* 0–1 minutes, 5–6 minutes, 9–10 minutes *d* beats per minute

4 *b* Force increases as mass increases. Force is linearly proportional to mass.

5 *a* Time versus age *b* Average height versus mass

9 Lines of best fit

1 straight, ruler, hand, first, last, not, equal, exactly

2 *a* Incorrect, line does not extend just beyond first and last points *b* Incorrect, not an equal number of points on both sides of the line *c* Correct *d* Incorrect, line forced to pass through (0, 0)
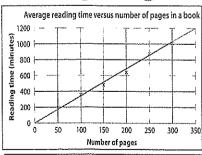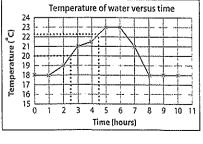
3 *a*   *b*   *c*

5 A mistake was made taking the measurement or a calculation was done incorrectly or the measuring device stopped working properly or a variable was not controlled.

10 Extrapolating and interpolating

3 The assumption made is that the relationship remains the same beyond the plotted points.

Average reading time versus number of pages in a book

6 Because line and scatter graphs involve continuous data, values between the points are meaningful. They are the only graphs that have lines that are able to be extended.

7 Interpolating is more likely to be accurate than extrapolating because the points either side have been measured and are known, whereas for extrapolating only one side of the value has been measured, the other side is unknown.

Temperature of water versus time

8 18°C

9 No, extrapolating because it extends beyond the plotted points