

Exercise 2B

- 1 a 700 g, as this is the most often occurring.
- b $500 + 700 + 400 + 300 + 900 + 700 + 700 = 4200$
 $\frac{4200}{7} = 600$ g
- c 300 400 500 **700** 700 700 900
 700 g is the median (the middle value).
- d It will increase the mean, as $650 > 600$ (the old mean).

The mode will be unchanged.

It will decrease the median. There will now be an *even* number of values, so we take the middle pair: 650 and 700. The new median will be half-way between these: 675.

- 2 a $\frac{256.2}{6} = 42.7$
- b It will increase the mean, as the new piece of data (52) is greater than the old mean (42.7).

- 3 a For May

$$\begin{aligned} v &= \frac{\sum v}{n} \\ &= \frac{724\,000}{31} \\ &= 23\,354.838\dots \\ &= 23\,355 \text{ m (to the nearest whole number)} \end{aligned}$$

For June

$$\begin{aligned} v &= \frac{\sum v}{n} \\ &= \frac{632\,000}{30} \\ &= 21\,066.666\dots \\ &= 21\,067 \text{ m (to the nearest whole number)} \end{aligned}$$

- b For the total recording period

$$\begin{aligned} v_{\text{total}} &= \frac{\sum (v_{\text{May}} + v_{\text{June}})}{n_{\text{May}} + n_{\text{June}}} \\ &= \frac{\sum (724\,000 + 632\,000)}{31 + 30} \\ &= 22\,229.508\dots \\ &= 22\,230 \text{ m (to the nearest whole number)} \end{aligned}$$

4 a 8 minutes. Everything else occurs only once, but there are two 8's.

b $\frac{102}{10} = 10.2$ minutes

c 5 6 7 8 **8** 9 10 11 12 26
The median is 8.5 minutes.

d The median would be reasonable. The mean is affected by the extreme value of 26. In this case the mode is close to the median, so would be acceptable; but this would not always be the case.

5 a 2 breakdowns

b The median is the 18.5th value = 1

c $(8 \times 0) + (11 \times 1) + (12 \times 2) + (3 \times 3) + (1 \times 4) + (1 \times 5) = 53$

The mean = $\frac{53}{36} = 1.47$ breakdowns

d The median, since this is the lowest value

6 $(5 \times 8) + (6 \times 57) + (7 \times 29) + (8 \times 3) + (9 \times 1) = 618$ petals

$8 + 57 + 29 + 3 + 1 = 98$ celandines

The mean = $\frac{618}{98} = 6.31$ petals (to 2 d.p.)

7 The mean = $\frac{1 \times 7 + 2 \times p + 3 \times 2}{7 + p + 2}$

$1.5 = \frac{7 + 2p + 6}{p + 9}$

$= \frac{2p + 13}{p + 9}$

$1.5p + 13.5 = 2p + 13$

$0.5 = 0.5p$

$p = 1$