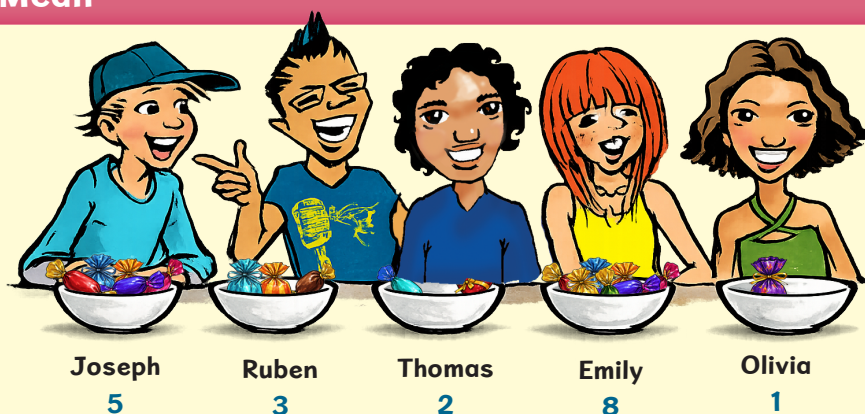




16B: Mean



These pictures show the number of chocolates given to five children.

By sharing the chocolates equally between the children we find the mean number of chocolates given to each child.

Altogether the children were given 20 chocolates.

If these were shared equally between the children each would have four.

$$20 \div 5 = 4$$

The mean number of chocolates given to each child is four.

The **mean** of a set of data is the sum of the data values divided by the number of data values.

$$\text{Mean} = \frac{\text{sum of data values}}{\text{number of values}}$$



The mean is often called the 'average'. In fact, the mean, median and mode are all measures of the average.

Worked example

This data gives the points scored by the horses in a show.

78 59 74 64 75 82 71 77 88 78 67 69

Find the mean number of points scored.

Answer $\text{Mean} = \frac{78 + 59 + 74 + 64 + 75 + 82 + 71 + 77 + 88 + 78 + 67 + 69}{12}$
 $= 73.5$

You can use a calculator when there are lots of values.



When calculating the mean, outliers are usually excluded.

Activity 2

1 Calculate the mean of these data sets.

- 2, 2, 3, 4, 4, 4, 5, 5, 7, 7, 8, 9.
- 2, 3, 7, 11, 12, 19, 23, 25, 29, 31, 36.
- 4, 7, 7, 7, 7, 8, 8, 9, 10, 10, 11, 13, 14, 14, 15.
- 22, 19, 14, 16, 27, 11, 32, 41, 17, 43.
- 5.2, 4.6, 2.7, 7.1, 11.4, 5.3, 6.2, 2.3.
- 8.7, 1.4, 3.7, 2.6, 8.9, 5.9, 1.2, 0.9, 4.3, 6.2.
- 24.6, 30, 25.3, 82.4, 63.9, 51.1, 80, 32.7, 48.75.

You can use a calculator if you need to.



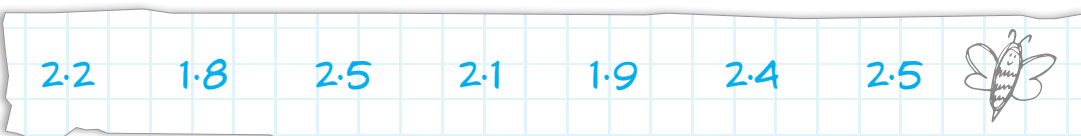
- 2 The number of goals scored by a football team in 15 matches were

3 0 1 0 0 2 1 2 0 3 0 4 0 1 1

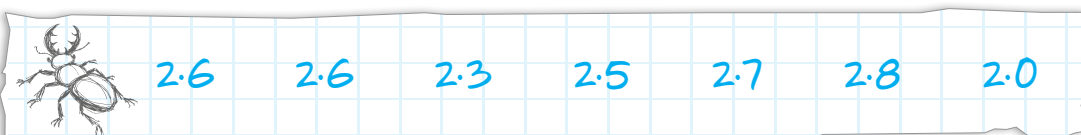
Find the mean number of goals scored.



- 3 Kauri was studying bugs in Science.
He wrote down the lengths, in centimetres, of 7 bugs.



- a Find the mean length of the bugs.
b Kauri measured another 7 bugs he collected from a different place.
What was the mean length of these bugs?



- c What was the mean length of all 14 bugs?
Could you find this by finding the mean of the answers to a and b?
- 4 Jan wrote down her results for some of her subjects.

English	68	75	71	74		
Maths	81	62	79	82	86	
Science	70	75	58	68	72	47
History	50	46	58	55	56	

- a What is her mean for Science?
b In which subject does Jan have the highest mean?
c Jan has to drop one of the subjects next year. Which one do you think she should drop? Why?
- 5 Mathew weighed himself six times on a set of very accurate scales.
The six readings were:



- a Are there any outliers?
b Calculate the mean.



- 6 The mean number of hours of training done by a group of ten swimmers last week was 12.



- a How many hours training did the ten swimmers do in total last week?
 b Another two swimmers were asked how much training they did last week. One said 14 hours, and the other 10 hours. Calculate the new mean number of hours training for all 12 swimmers.

- 7 What three numbers could go in these boxes so that the mean of the three numbers is 7?

CHALLENGE

- 8 Jack has four number cards. Their mean is 5. Jack picks another card. The mean of his five cards is 6. What number is on the new card?



- 9 a Three meals have an average price of \$25. What might the price of these meals be?
 b In five tests, Tina's average mark was 66. What might Tina's marks be?
 c Ben's marks for his first four maths tests were: 72, 64, 63, 69. What was Ben's mean mark? What mark does Ben need to get in his next test to raise his mean to 70?

72	64	63	69
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- 10 Asad got these marks in his first four mental tests.



The mean is 8.
 After his fifth test, the mean of his marks was still 8.
 What mark did he get in his fifth test?

11



- Olivia plays in her school netball team. She will be selected to play for the regional team next season if her mean score of goals after the first 7 games is at least 12. After 6 games her mean score is 11.5.
- a What is the total number of goals Olivia has scored in these 6 games.
 b What is the least number of goals she must score in the next game in order to be chosen?
 c In the seventh game she scores 13 goals. Has her mean score of goals increased or decreased?