

Fix it 1 Read the table

Mean from a frequency table · ANSWERS

The frequency is how many times the value happened: how many people, matches or days had it.

EXAMPLE

What does the column for 2 pets mean?

Pets	0	1	2	3
Frequency	4	6	5	1

- Find 2 in the Pets row.
- Read the frequency under it: 5.
- 5 people each have 2 pets.
Not 2 people with 5.

YOUR TURN

- How many children read exactly 2 books?

Books read	0	1	2	3	4
Frequency	3	8	6	2	1

6

- Write out the data in the table as a list.

Siblings	0	1	2	3
Frequency	2	3	1	1

0, 0, 1, 1, 1, 2, 3

- How many people drink more than 2 cups of tea a day?

Cups a day	0	1	2	3	4
Frequency	5	9	7	3	2

5

Check: Written as a list, the data has as many numbers as the frequencies add up to.

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Fix it 2 Frequency × value

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Multiply each value by its frequency. That is the total for that value: all its goals, pets or eggs.

EXAMPLE

Complete the last column.

Goals	Frequency	Frequency × value
0	2	0
1	5	5
2	6	12
3	3	9

- 1 goal in each of 5 matches:
 $1 \times 5 = 5$ goals.
- 2 goals in each of 6 matches:
 $2 \times 6 = 12$.
- 0 goals: $0 \times 2 = 0$, however many matches.

YOUR TURN

- 8 nests each hold 3 eggs. How many eggs are in those nests?

24

- Work out frequency × value for each column.

Cars	0	1	2	3
Frequency	4	9	7	2

0, 9, 14, 6

- Work out frequency × value for each column.

Hours	0.5	1	1.5	2
Frequency	6	4	8	3

3, 4, 12, 6

Check: Divide each answer by its frequency: you get the value back.

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Fix it 3 The total of the values

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Add the Frequency × value column. That is every value added up: all the goals, all the pets.

EXAMPLE

The Frequency × value column for the goals is 0, 5, 12, 9. How many goals were scored?

- 1. Add that column: 0 + 5 + 12 + 9 = 26.
- 2. 26 goals in all the matches.
- 3. Not the Goals column: 0 + 1 + 2 + 3.

YOUR TURN

- 1 The Frequency × value column is 0, 7, 16, 15, 8. Work out its total.

46

- 2 How many pens are there altogether?

Pens in a pencil case	1	2	3	4
Frequency	5	6	2	3

Pens = 35

- 3 Max says the team scored 0 + 1 + 2 + 3 + 4 = 10 goals. Work out the real total.

Goals	0	1	2	3	4
Frequency	2	6	5	4	1

Goals = 32

Check: Write the data out as a list and add it. You get the same total. The Maths Habit

Fix it 4 The total frequency

Mean from a frequency table · ANSWERS

Add the frequency column. That is how many people, matches or days there are.

EXAMPLE

The frequencies of the goals are 2, 5, 6 and 3. How many matches were played?

- 1. Add the frequencies: 2 + 5 + 6 + 3 = 16.
- 2. The team played 16 matches.
- 3. Not 4: that is how many different values there are.

YOUR TURN

- 1 How many people were asked?

Pets	0	1	2	3
Frequency	7	4	6	3

20

- 2 How many people are in the survey?

Bus journeys	0	1	2	3	4	5
Frequency	3	0	5	8	2	4

22

- 3 Jo says 5 people took the quiz, as there are 5 scores. How many did?

Quiz score	0	1	2	3	4
Frequency	6	11	9	3	1

30

Check: The total frequency counts people or matches, never columns or rows. The Maths Habit

Fix it 5 Divide

Mean from a frequency table · ANSWERS

Mean = total of the Frequency $\times$ value column $\div$ total frequency. Never $\div$ how many different values there are.

EXAMPLE

26 goals in 16 matches. Work out the mean number of goals per match.

1. Mean = total of the values $\div$ total frequency.
2. $26 \div 16 = 1.625$
3. 1.6 goals per match, to 1 decimal place.

YOUR TURN

- 1 The Frequency $\times$ value column totals 63. The total frequency is 18. Work out the mean.

Mean = 3.5

- 2 Work out the mean number of cups of coffee a day.

Cups a day	0	1	2	3
Frequency	4	7	5	4

Mean = 1.45

- 3 Kai's table has 4 different values, 30 people and a Frequency $\times$ value total of 72. He works out $72 \div 4$. Work out the mean.

Mean = 2.4

Check: Multiply your mean by the total frequency: you get the total back.

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Fix it 6 The midpoint

Mean from a frequency table · ANSWERS

Grouped data: each class gets one value, its midpoint. Add the two ends and halve.

EXAMPLE

Find the midpoint of $10 < t \leq 20$.

1. Add the two ends: $10 + 20 = 30$.
2. Halve it: $30 \div 2 = 15$.
3. 15 stands for every time in that class.

YOUR TURN

- 1 Find the midpoint of $20 < m \leq 30$.

Midpoint = 25

- 2 Find the midpoint of $0 < t \leq 5$.

Midpoint = 2.5

- 3 Find the midpoint of $30 < h \leq 45$.

Midpoint = 37.5

Check: The midpoint is the same distance from each end of the class.

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Fix it 7 Grouped: an estimate

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Frequency $\times$ midpoint, total it, $\div$ total frequency. It is an estimate: the exact values are lost.

EXAMPLE

Estimate the mean time.

Time (t min)	Frequency	Midpoint
$0 < t \leq 10$	3	5
$10 < t \leq 20$	5	15
$20 < t \leq 30$	2	25

1. Frequency $\times$ midpoint: 15, 75, 50. Total 140.
2. $140 \div 10 = 14$ minutes.
3. An estimate: we only know each class, not each time.

YOUR TURN

- 1 Estimate the mean mass.

Mass (m kg)	$0 < m \leq 4$	$4 < m \leq 8$	$8 < m \leq 12$
Frequency	5	9	6

Mean = 6.2 kg

- 2 Estimate the mean length.

Length (l cm)	$10 < l \leq 20$	$20 < l \leq 30$	$30 < l \leq 50$
Frequency	4	7	9

Mean = 29.75 cm

- 3 Why is your answer to question 1 only an estimate?

We do not know each exact mass

Check: The estimate sits inside the table, nearest the classes with the biggest frequencies.

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Fix it 8 Sense check

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The mean lies between the smallest and largest value, and leans towards the biggest frequencies.

EXAMPLE

The goals in a match go from 0 to 3. Ali works out a mean of 6.5 goals. Can he be right?

1. The mean lies between the smallest and largest value.
2. 6.5 is more than 3: he is wrong.
3. Did he divide by how many values there are?

YOUR TURN

- 1 One of these is the mean: 0.8, 3.05, 12.2. Which?

Score	1	2	3	4	5
Frequency	2	5	6	4	3

3.05

- 2 The last class in a table of times is $30 < t \leq 40$ minutes. Leah estimates a mean of 52 minutes. Right or wrong?

Wrong: 52 is over 40

- 3 Without working it out: is the mean nearer 1 or 3?

Pets	0	1	2	3	4
Frequency	9	7	2	1	1

Nearer 1: most have 0 or 1

Check: Mean outside the values? Check which total you divided, and what you divided by.

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