

AVERAGES AND RANGE

After completing this unit, you will be able to:

- *calculate the mean average for up to ten items of data*
 - *calculate the range of up to ten items of data*
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MEAN AVERAGE

The average value of a group of numbers is a number that can be used to represent the whole group.

The **MEAN AVERAGE** is calculated as follows:

*ADD UP ALL THE NUMBERS.
DIVIDE YOUR ANSWER BY THE
NUMBER OF NUMBERS THEREARE.*

Examples

1. Here are five numbers.

2 11 8 6 3

Find the mean number.

Answer

$$\begin{array}{r}
 2 \\
 11 \\
 8 \\
 6 \\
 3 \quad + \\
 \hline
 30
 \end{array}$$

there are five numbers, so divide 30 by 5.

$30 \div 5 = 6$ so the mean is 6.

2. The temperature of a science laboratory was recorded daily at noon over six days. The results are given in the table below.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9°C	11°C	14°C	12°C	8°C	0°C

What is the mean temperature at noon ?

Answer

$$\begin{array}{r}
 9 \\
 11 \\
 14 \\
 12 \\
 8 \\
 0 \\
 \hline
 54
 \end{array}$$

there are six days so divide 54 by 6

$$54 \div 6 = 9 \text{ so the mean temperature is } 9^{\circ}\text{C}.$$

Self assessment one

1. Find the mean of the following groups of numbers.

a) 12 4 14 3 7

b) 5 cm, 4 cm, 3 cm, 2 cm, 2 cm
8 cm, 5 cm, 4 cm, 4 cm, 3 cm

c) £2.50, £1.50, £1.00, £1.60

d) 2 4 5 8 0 1 2 2

e) 8°C, 8°C, 6.2°C, 4.7°C, 5.1°C

2. Sharon made a record of how much she spent each week on entertaining her daughter.



What is the mean amount she spends per week ?

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
£18	£10	£15	£9	£12	£8

- A £10 B £12 C £15 D £13

3. The table below shows the daily hours of sunshine in the Costa del Sol for the months of January to September.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
5	7	8	9	10	11	12	10	9

What is the mean of the daily hours of sunshine for the months shown?

- A 5 B 9 C 12 D 81

4. As part of a Health and Social Care assignment, a student researched the price of ten different drinks for children, five fizzy drinks and five fruit juices. Her task was to find out if, on average, it is cheaper to buy fizzy drinks or fruit juices.

Fruit juice	Price per 300 ml	Fizzy drink	Price per 300 ml
A	50p	A	55p
B	65p	B	85p
C	80p	C	55p
D	60p	D	65p

- a) What's the mean price of fruit juice ?
 b) What's the mean price of fizzy drink ?
 c) What should the student's conclusion be ?

Now check your answers.

RANGE

The range of a group of numbers tells you how wide the numbers are spread.

The **RANGE** is calculated as follows:

THE BIGGEST VALUE MINUS THE SMALLEST VALUE.

Examples

1. Find the range of the following numbers.

5 7 2 9 8 6 12 4

Answer *The biggest number is 12.*
The smallest number is 2.

$$\text{Range} = 12 - 2 = 10.$$

2. The temperature of a science laboratory was recorded daily at noon over six days. The results are given in the table below.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9°C	11°C	14°C	12°C	8°C	0°C

What is the range of noon temperatures for the six days ?

Answer *The smallest number is now 0°C.*

$$14 - 0 = 14, \text{ so the range is } 14^\circ\text{C}.$$

Self assessment two

1. Find the range of the following groups of numbers.

a) 9 15 1 8 2 3

b) 10°C 2°C 22°C 15°C 7°C 2°C

c) £3.00 £1.20 £4.50 £6.30 £2.00 £9.10

2. Mike is a car salesman.

The table shows how many cars he has sold each month for a six month period.

April	May	June	July	August	September
9	10	5	12	7	8

What is the range of number of vehicles he has sold from April to September ?

A 5

B 7

C 9

D 12

Now check your answers

ANSWERS

Self assessment one

1.
 - a) $40 \div 5 = 8$
 - b) $40 \div 10 \text{ cm} = 4 \text{ cm}$
 - c) $\text{£}6.60 \div 4 = \text{£}1.65$
 - d) $24 \div 8 = 3$
 - e) $32^{\circ}\text{C} \div 5 = 6.4^{\circ}\text{C}$,

2. $\text{£}12$

3. **B** 9

4.
 - a) $255\text{p} \div 4 = 63.75\text{p} = 64\text{p}$ to the nearest penny.
 - b) $260\text{p} \div 4 = 65\text{p}$
 - c) fruit is slightly cheaper!

Self assessment two

1.
 - a) $15 - 1 = 14$
 - b) $22^{\circ}\text{C} - 2^{\circ}\text{C} = 20^{\circ}\text{C}$
 - c) $\text{£}9.10 - \text{£}1.20 = \text{£}7.90$

2. **B** 7

Averages and Range

Mini Test

For the following questions, circle either answer A, B, C or D.

Five friends take part in a sponsored run and record the amounts they collected. The amounts are recorded in the table.

Name	Ada	Bal	Cath	Dan	Ernest
Sponsorship (£)	10.00	24.00	23.50	42.50	60.00

Use the information above to answer questions 1 and 2.

1. What was the mean amount of sponsorship money collected per person ?

A £160 B £35 C £30 D £32

2. What was the range of the sponsorship money to be collected?

A £60 B £50 C £10 D £35

Willy is worried about his spending and decided to make a note of how much he withdraws from the cash machine on a daily basis.

Over the past ten days he has made the following withdrawals:

£50 £40 £40 £140 £70
£0 £50 £90 £130 £50

Use this information to answer questions 3 and 4.

3. What is the mean amount he has withdrawn ?

A £66 B £70 C £50 D £140

4. What is the range of Willy's withdrawals ?

A £100 B £66 C £140 D £70

1. D
2. B
3. A
4. C