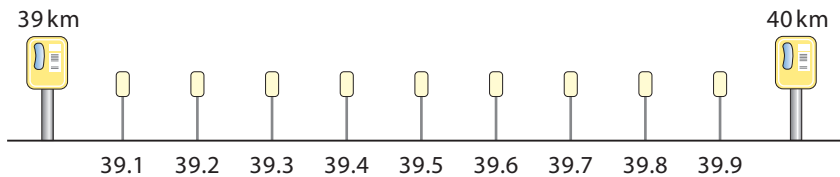# 5 Rounding and multiplying

This work will help you

- round to the nearest whole number and to one, two and three decimal places
- multiply and divide by 10, 100, 1000, … (including converting between metric units)

A Rounding to the nearest whole number (answers p 00)

On a motorway there is a phone every kilometre.
There are distance posts every 100 metres.

If you break down, you want to walk to the nearest phone.

- Which phone would you walk to if you broke down next to the post at 39.8?
- Which phone is nearest to 39.37 km?

A1 Which whole number is nearest to each of these?

   (a) 3.9   **(b)** 4.1   **(c)** 18.7   **(d)** 13.9   **(e)** 27.4

A2 Round these to the nearest **metre**.

   (a) 4.6 m   **(b)** 17.2 m   **(c)** 20.3 m   **(d)** 5.8 m   **(e)** 47.9 m

A3 Round these to the nearest kilometre.

   (a) 134.2 km   **(b)** 12.5 km   **(c)** 981.3 km   **(d)** 26.5 km   **(e)** 89.6 km

A4 Which whole number is nearest to each of these?

   (a) 4.83   **(b)** 2.34   **(c)** 7.88   **(d)** 5.36   **(e)** 16.75

A5 Round these to the nearest kilogram.

   (a) 5.73 kg   **(b)** 1.09 kg   **(c)** 14.64 kg   **(d)** 10.59 kg   **(e)** 18.29 kg

A6 Round these to the nearest litre.

   (a) 17.77 litres   **(b)** 53.91 litres   **(c)** 37.02 litres   **(d)** 0.92 litre   **(e)** 15.08 litres

A7 Round these to the nearest whole number.

   (a) 6.7   **(b)** 31.17   **(c)** 53.47   **(d)** 19.59   **(e)** 0.89
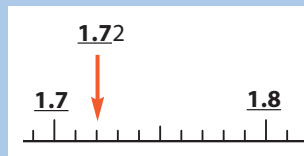
B Rounding to one decimal place (answers p 00)

Examples

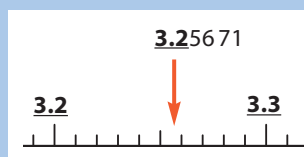Round 1.72 to one decimal place.

> 1.72 is between 1.7 and 1.8
> It is closer to 1.7 (the '2' tells you this) so 1.72 rounds to 1.7

Round 3.256 71 to one decimal place.

> 3.256 71 is between 3.2 and 3.3
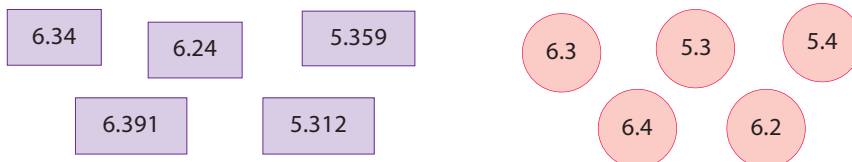> It is closer to 3.3 (the '5' tells you this) so 3.256 71 rounds to 3.3

This is a simple rule for rounding to one decimal place.

> If the digit in the second decimal place is
> - 5 or above, round up
> - 4 or below, round down

B1 The numbers in the rectangles are written to one decimal place in the circles. Find five matching pairs.

6.34 6.24 5.359 6.391 5.312

6.3 5.3 5.4 6.4 6.2

B2 Round these numbers to one decimal place.

(a) 1.21   (b) 5.67   (c) 0.18   (d) 12.39   (e) 14.34

(f) 4.578   (g) 9.345   (h) 12.417   (i) 0.380   (j) 1.308

B3 Round these numbers to one decimal place.

(a) 6.783 24   (b) 1.539 243 5   (c) 7.108 462 3   (d) 2.063 219 3

B4

A	B	E	H	I	G	L	N	P	R	T	W
2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1

Round each decimal below to one decimal place and find a letter for each one. Rearrange each set of letters to spell an animal.

(a) 2.8604, 2.24, 2.138, 2.034

(b) 2.609, 2.2561, 2.1901, 1.964, 3.101 31

(c) 2.51, 2.908, 2.412, 2.98, 2.1984

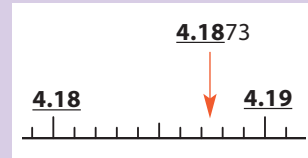(d) 2.764 123, 2.2461, 2.5543, 2.344 52, 1.983 61, 3.0499, 2.221 09, 2.706 71

C Rounding to more than one decimal place (answers p 00)

Examples

Round 4.1873 to two decimal places.
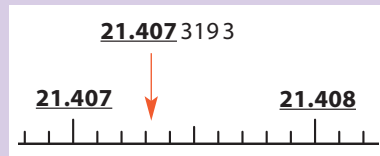
> 4.1873 is between 4.18 and 4.19
> It is closer to 4.19 (the '7' tells you this) so 4.1873 rounds to 4.19

4.1873

4.18   4.19

Round 21.4073193 to three decimal places.

> 21.4073193 is between 21.407 and 21.408
> It is closer to 21.407 (the '3' tells you this) so
> 21.4073193 rounds to 21.407
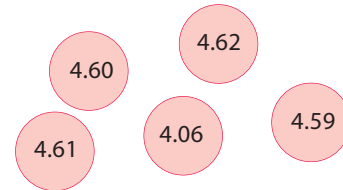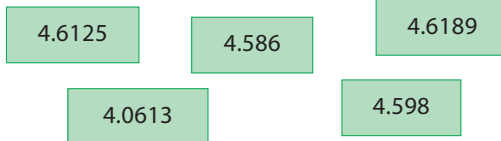
21.4073193

21.407   21.408

This is a rule for rounding decimals.

> Find the last column you are interested in (1st, 2nd, 3rd, … decimal place).
> If the next digit on the right is   • 5 or above, round up
>   • 4 or below, round down

C1 The numbers in the rectangles are written to two decimal places in the circles.
Find five matching pairs.

4.6125   4.586   4.6189   4.0613   4.598
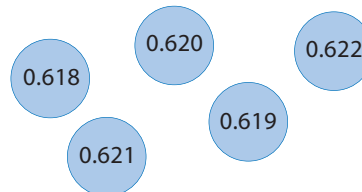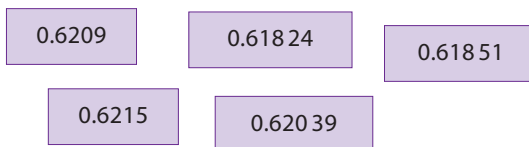
4.62   4.60   4.61   4.06   4.59

C2 Round these numbers to two decimal places.

(a) 5.631   (b) 16.126   (c) 6.401   (d) 23.089   (e) 1.325

C3 Round these to the nearest penny.

(a) £1.68123   (b) £14.92604   (c) £5.235631   (d) £26.5013964

C4 The numbers in the rectangles are written to **three** decimal places in the circles.
Find five matching pairs.

0.6209   0.61824   0.61851   0.6215   0.62039

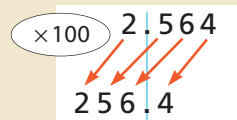0.620   0.622   0.618   0.619   0.621

C5 Round these numbers to three decimal places.

(a) 1.4936   (b) 1.9284   (c) 3.58129   (d) 13.24561

(e) 1.59001   (f) 1.23991   (g) 15.47912   (h) 0.87978

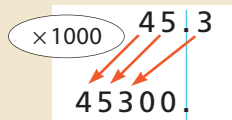## D Multiplying and dividing by powers of ten (answers p 00)

Examples

$2.564 \times 100 = 256.4$	$45.3 \times 1000 = 45\,300$	$349 \div 10 = 34.9$	$19.3 \div 1000 = 0.0193$

$\times 100$ 2.564
256.4

$\times 1000$ 45.3
45300.

$\div 10$ 349.
34.9

$\div 1000$ 19.3
0.0193
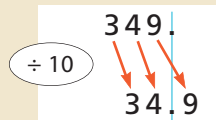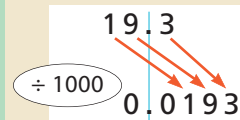
Multiplying by 100 moves figures two places to the left.

Multiplying by 1000 moves figures three places to the left.

Dividing by 10 moves figures one place to the right.

Dividing by 1000 moves figures three places to the right.

D1 Calculate each of these.

  (a) 2.89×10 (b) 4.91×100 (c) 59.436×100 (d) 0.904×1000

  (e) 9.5×100 (f) 0.549×1000 (g) 13.2×100 (h) 2.31×1000

D2 Calculate each of these.

  (a) $46.1 \div 10$ (b) $4290.6 \div 100$ (c) $5932 \div 1000$ (d) $53.2 \div 100$

  (e) $9.3 \div 100$ (f) $0.5 \div 10$ (g) $13 \div 1000$ (h) $0.12 \div 1000$
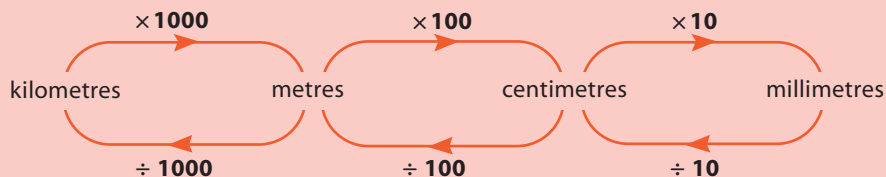
D3 Calculate each of these.

  (a) 3.09×10 (b) $4.2 \div 10$ (c) 23.41×100 (d) 0.21×1000

  (e) $54 \div 100$ (f) $2.34 \div 100$ (g) 1.2×1000 (h) $0.34 \div 100$

D4 Find the missing number in each calculation.

  (a) $\blacksquare \times 10 = 67.3$ (b) $678 \div \blacksquare = 6.78$ (c) $3.01 \times \blacksquare = 3010$

E Metric units (answers p 00)

Length

	$\times 1000$		$\times 100$		$\times 10$	
kilometres		metres		centimetres		millimetres
	$\div 1000$		$\div 100$		$\div 10$	

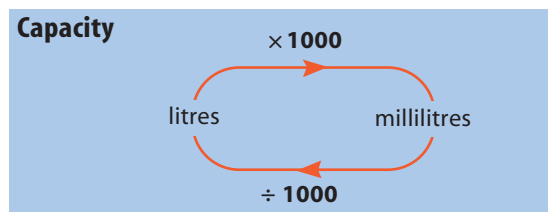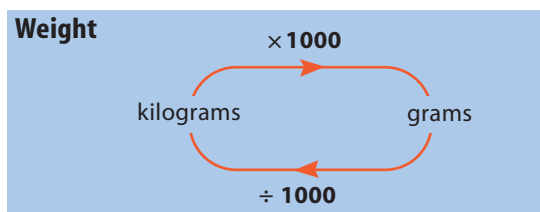**E1**   **A** 1.6×100 **B** 1.6×1000 **C** $1.6 \div 1000$ **D** $1.6 \div 100$

  (a) Choose the correct calculation to change 1.6 km to metres.

  (b) Choose the correct calculation to change 1.6 cm to metres

E2 (a) Change 87 200 m to kilometres.   (b) Change 4.5 m to centimetres.

     (c) Change 72 mm to centimetres.   (d) Change 3.2 km to metres.

E3 Senzo's bamboo plant grows 63 cm every day.

(a) In centimetres, how much does it grow in 10 days?

(b) Give your answer in metres.

E4 The smallest recorded marine fish is the dwarf goby at 8.6 mm long.

(a) In millimetres, how long is a line of 100 dwarf goby fish, placed end to end?

(b) Give your answer in centimetres.

E5 Vincent's car is 4.5 m long.

(a) How long is a line of 1000 of these cars, placed end to end?

(b) York is 39 km from Leeds. Would the line of cars stretch this far?

E6 A specimen of *Dioon edule*, a Mexican evergreen shrub, was found to be growing only 0.76 mm in a year. At this rate, how many centimetres would it grow in a thousand years?

E7 The full stops in this book are 0.5 mm wide. How wide will a hundred of these full stops be if they are printed side by side? Give your answer in centimetres.

Weight		**Capacity**	
×1000		×1000	
kilograms — grams		litres — millilitres	
÷1000		÷1000	

E8 (a) Change 2450 g to kilograms. (b) Change 1.2 litres to millilitres.

(c) Change 890 ml to litres. (d) Change 0.3 kg to grams.

E9 Which is heavier, the cat or the hedgehog?

2.58 kg   785 g

E10 A house mouse weighs 12 g. How much would 100 of these mice weigh in kilograms?

E11 Jane has two cartons of milk. One carton holds 500 ml and the other holds 250 ml. How many **litres** of milk does she have altogether?

E12 Helen buys 6 bags of flour, each holding 250 grams. How many kilograms of flour does she buy altogether?

E13 Here are some glasses.
List them in order, starting with the one that holds the most.

A   **B**   **C**   **D**   **E**

225 ml   0.175 litre   0.2 litre   150 ml   0.30 litre

E14 Sue has a bottle that holds 0.3 litre of medicine.
She takes 5 ml of this medicine every day.
How long will her medicine last?

E15 Put these weights in order, smallest first.

300 g, 0.5 kg, 0.07 kg, 67 g, 892 g, 1.04 kg, 0.985 kg

Test yourself (answers p 00)

T1 (a) The average weight for the men in a local football team is 74.85 kg.
What is this to the nearest kilogram?

    (b) Round 2.367 89 to one decimal place.

T2 What is the missing number in $3.4 \times \blacksquare = 3400$?

T3 A hairdresser buys a large bottle of shampoo that holds 1.5 litres.
How many millilitres of shampoo is this?

T4 Put these volumes in order, largest first.

500 ml   4 litres   250 ml   1.5 litres   OCR

T5 Delroy bought a pack of 4 videos for £9.95 .
Use a calculator to find how much each video cost him, correct to
the nearest penny.

T6 Chetna has two bags of rice.
One weighs 1.5 kg and one weighs 750 g.
How much rice does she have altogether in kilograms?

T7 Abid buys a 1.5 kg bag of potatoes.
He uses 650 grams.
How many grams of potatoes are left in the bag?   OCR