Maths in Science
Decimals

Decimal Places

Most of the numbers we use in science, are not likely to be **whole numbers**. This means they will have decimal places.

For example:

If we say a car travels at a speed of 5.2 m/s. The value '5.2' has a decimal place, so it is not a whole number.

Most of our calculations in science produce values with so many decimal places we need to 'shorten' the number.

For example:

The value we know as π = 3.141592654..... and carries on forever!

We normally write π = 3.14. This is called 'rounding'.

There are two steps to follow when rounding decimal places.

Step 1: Decide how many decimal places you want in your final answer.

Step 2: Decide the value of the last decimal place by either 'rounding up' or 'rounding down', as shown below.

Example 1: Rounding π to 6 decimal places:

a. π = 3.141592654. Here '2' is in the sixth decimal place.

b. The next value to the right is '6'. A value of '5' or more means we 'round up' our value of '2' to a value of '3', as shown below.

c. π = 3.141593 (to 6 decimal places).

Example 2: Rounding π to 1 decimal place:

a. π = 3.141592654. Here '1' is in the first decimal place.

b. The next value to the right is '4'. A value less than '5' means we 'round down' our decimal place. The value '1', stays as '1'.

c. π = 3.1 (to 1 decimal place).

Exam tips!

- When doing a calculation, write down and use the all the digits shown by your calculator without rounding them.
- Write down all working; it can get marks even if your final answer is not correct.

Maths in Science
Decimals

Decimal Places: Checking understanding

Question 1

The actual length of the red blood cell from a turtle is 20.528 μm.
Round this value to 2 decimal places.

Answer _____μm

Question 2

The table below shows the boiling points of four substances.
Complete the table by rounding each Boiling Point to 1 decimal place.

Substance	Boiling Point / ^{o}C	Boiling Point / ^{o}C (to 1 decimal place)
Propane	- 42.351	
Butane	0.147	
Pentane	36.783	
Hexane	69.326	

Question 3 (Higher Demand)

A car is travelling at a speed of 31 m/s.

The car travels 46 m between the driver seeing an emergency and starting to brake.

Calculate the driver's reaction time. Give your answer to 2 decimal places.

Use the equation: $time = \frac{distance}{speed}$

driver's reaction time = ... s

Decimal Places: Checking understanding (Answers)

Question 1
The actual length of the red blood cell from a turtle is 20.528 μm.
Round this value to 2 decimal places.

Answer = 20.53 μm

Question 2
The table below shows the boiling points of four substances.
Complete the table by rounding each Boiling Point to 1 decimal place.

Substance	Boiling Point / °C	Boiling Point / °C (to 1 decimal place)
Propane	- 42.351	- 42.4
Butane	0.143	0.1
Pentane	36.783	36.8
Hexane	69.326	69.3

Question 3 (Higher Demand)

A car is travelling at a speed of 31 m/s.

The car travels 46 m between the driver seeing an emergency and starting to brake.

Calculate the driver's reaction time. Give your answer to 2 decimal places.

Use the equation: $time = \frac{distance}{speed}$

$$time = \frac{46}{31} = 1.4839$$

driver's reaction time = 1.48 s