Practise Key Skills at Home:

# Autumn Term 1 Year 6 Maths

**(Ages 10 - 11)**

Activity Booklet

# For Parents

This year 6 activity booklet has been created to help your child practise some of the key skills that they have learnt in primary school. The national curriculum subjects of English and maths have been split among the different booklets. These booklets include clear explanations, examples and activities for your child to try at home in order to help them develop their confidence and understanding of each area.

Share the introduction and explanation for each topic with your child. Talk through it together.

Challenge your child to try the activities independently.

Use the answer pages to encourage your child to self-assess and mark their own activities.

The topics can be done in any order. Your child doesn't have to work through the booklet in order.

Keep the activities short and snappy - your child doesn't need to spend hours on each topic. They are designed to be quick, practise activities.

Don't worry if your child is finding an activity too difficult, follow the hints and tips on each page to give them some extra support.

Remember to praise and encourage your child.

# How to Use the Booklet

The title of the topic is at the top of each page. This tells your child what skill the activity is practising.

There is a handy space at the top of each topic to place a badge or tick when you have completed it!

## Place Value

Place value is all about how much each digit is worth within a number. A digit is any numeral from 0 to 9. When a digit is placed on a place value chart, like the one below, its value will change depending on which column it is in. Each column is ten times the value of the column to its right. For example, one thousand is ten times the value of one hundred (or ten hundreds make one thousand).

| Tm | M | Hth | Tth | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|---|
| Ten Millions | Millions | Hundred Thousands | Ten Thousand | Thousands | Hundreds | Tens | Ones | Tenths | Hundredths | Thousandths |
| 10 000 000 | 1 000 | 100 000 | 10 000 | 1000 | 100 | 10 | 1 | 0.1 | 0.01 | 0.001 |

The first part of each activity gives your child an explanation of what the topic is about.

example, in the number 309 871.6, the digit 9 is in the thousands column. This means is worth **9 000** or **nine thousands**.

o in 309 871.6 is saying there are **no ten thousands**. If this zero wasn't there, the r would read 39 871.6 which would change the value of some of the digits. Zero acts **placeholder** in the number, making sure we read the number correctly and know the ue of the other digits.



The next section gives your child some examples of how to use the skill.

# How to Use the Booklet

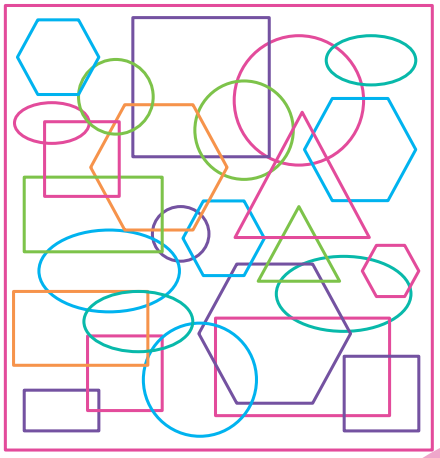
Finally, there will be an activity for your child to practise applying the skill.

**b. Drawing Shapes** - on the grid below, draw:

| | |
|---|---|
| A square with sides of 5cm. | A triangle with a base of 2cm. |
| A regular hexagon. | An irregular pentagon. |

**c. Lateral Thinking Puzzle**

These shapes are in a muddle! Can you count how many of each shape is in this mess? As a challenge, try counting how many shapes of each colour you can see too.



**Parent Tip:** Ask your child to describe the properties of each of these 2D shapes. Make sure they us
word sides and vertices in their response and give as much detail as they can.



If your child is finding an activity too difficult, use the parent tip box to give them some extra support.

# Contents Page

# 2D Shapes

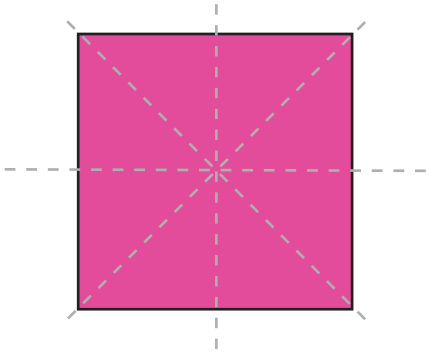
2D shapes are **flat shapes** which only have two dimensions (length and width). Common 2D shapes include: squares, rectangles, circles and triangles.

Each shape has a set of unique **properties** which make it the shape it is and help us to recognise it. The properties of 2D shapes include the sides (the edges of the shape) and vertices (the corners of the shape).

In KS2 (ages 7 - 11), types of lines, angles in a shape and lines of symmetry will also be introduced. This can help to describe a shape in even more detail.

Here is an example of the properties of a **square**:

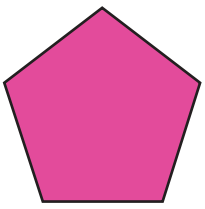
## Square



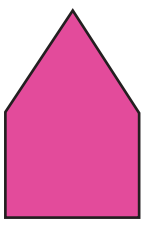
| | |
|---|---|
| Sides | 4 |
| Vertices | 4 |
| Angles | add to 360° |
| Symmetry | 4 lines |

It is also important to understand whether a shape is **regular** or **irregular**. A **regular** shape is a shape where all the sides are the same length and all the internal angles are equal. An **irregular** shape is the opposite, so all the sides are different lengths and the internal angles are not equal. A square is always a regular shape, as all the sides are always the same length and all the internal angles are 90°. However, most other shapes can have regular and irregular examples.

### This is a regular pentagon:



### This is an example of an irregular pentagon:



# 2D Shapes

**a.** Here are some 2D shapes that you might come across. Some of the information has been removed. Can you work out what's missing and complete the table?

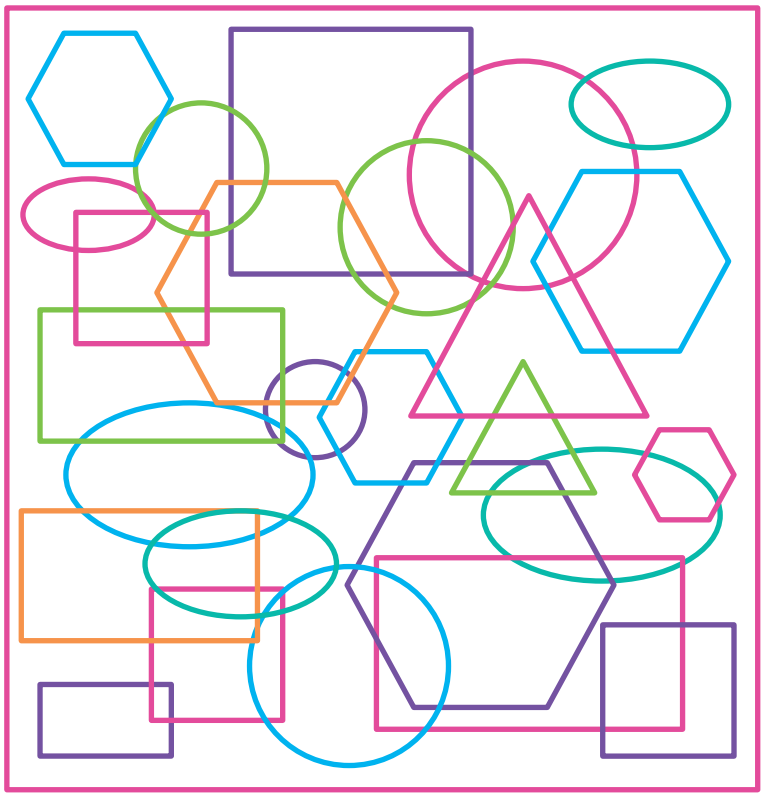
| Name | Sides | Corners |
|---|---|---|
| triangle  | 3 | 3 |
| circle | 1 | 0 |
| square  | 4 | |
| rectangle  | 4 | 4 |
|  | 5 | 5 |
| hexagon | 6 | 6 |
|  | 1 | 0 |
| rhombus  | 4 | 4 |
| trapezium  | | 4 |
| parallelogram  | 4 | 4 |

**b. Drawing Shapes** - on the grid below, draw:

| | |
|---|---|
| A square with sides of 5cm. | A triangle with a base of 2cm. |
| A regular hexagon. | An irregular pentagon. |

## c. Lateral Thinking Puzzle

These shapes are in a muddle! Can you count how many of each shape is in this mess? As a challenge, try counting how many shapes of each colour you can see too.

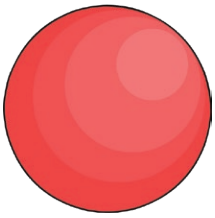


**Parent Tip:** Ask your child to describe the properties of each of these 2D shapes. Make sure they use the word sides and vertices in their response and give as much detail as they can.

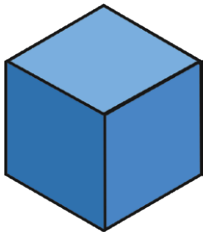
# 3D Shapes

3D shapes are shapes which have **three dimensions** (length, width and depth). They aren't flat shapes, which means we can touch and hold them. 3D shapes include: cubes, pyramids, spheres and cones. Here is what they might look like:

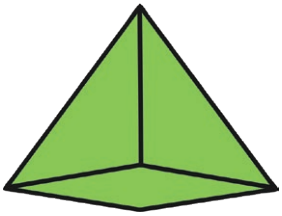
**sphere**



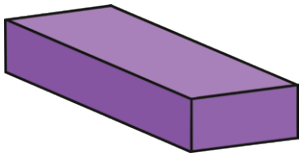
**cube**



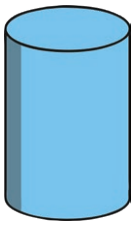
**pyramid**



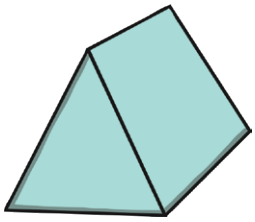
**cuboid**



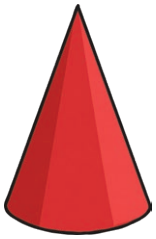
**cylinder**



**triangular prism**



**cone**



It can be helpful to think about real-life objects which help us visualise 3D shapes. For example:

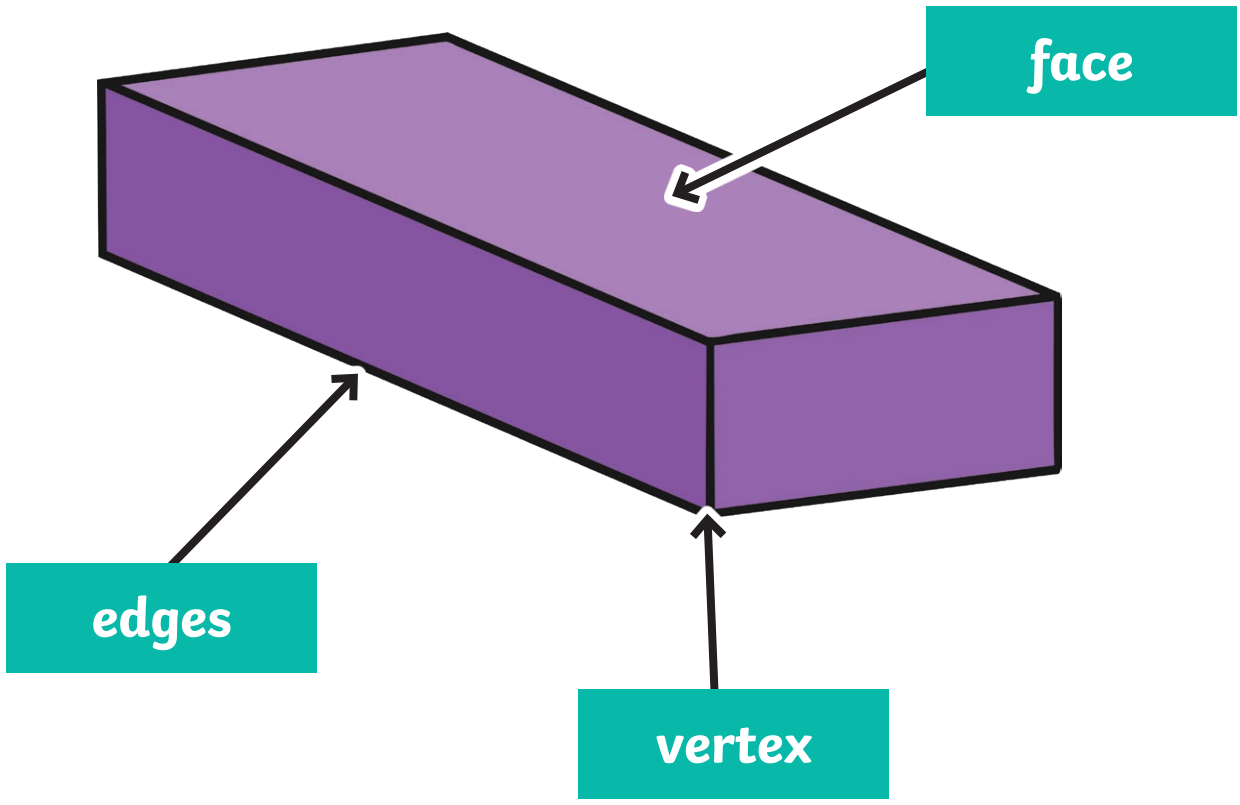
- A ball is a sphere.
- A dice is a cube.
- A party hat is a cone.
- The Egyptian pyramids are square-based pyramids.

If you have any of these available (or similar shapes), it can be a nice activity to hold them and use your finger to talk about and identify its properties.

When talking about the properties of 3D shapes, we look at **faces**, **edges** and **vertices**.

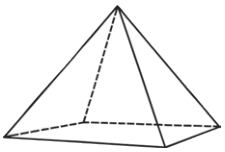
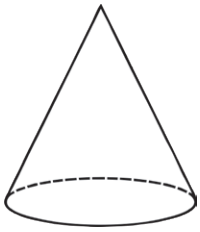
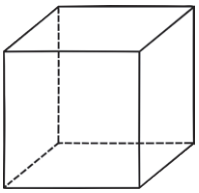
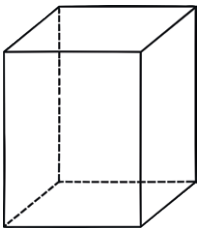
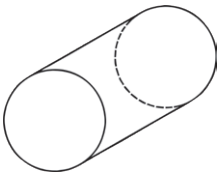
- **Faces:** A face is a flat or curved surface on a 3D shape. For example, a cube has six faces, a cylinder has three and a sphere has just one.
- **Edges:** An edge is where two faces meet. For example, a cube has 12 edges, a cylinder has two and a sphere has none.
- **Vertices:** A vertex is a corner where edges meet. The plural is vertices. For example, a cube has eight vertices, a cone has one vertex and a sphere has none.

## Here is a cuboid:




A cuboid has 6 faces, 12 edges and 8 vertices. You can add extra details to your description. For example, a cuboid has 6 rectangular faces, 12 straight edges and 8 vertices. This can help to imagine the shape or describe it effectively to someone else.

## a. Properties of 3D Shapes

| sphere | pyramid | cone | cube | cuboid | cylinder |
|---|---|---|---|---|---|
| It has...<br>☐ edges<br>☐ vertices<br>☐ faces | It has...<br>☐ edges<br>☐ vertices<br>☐ faces | It has...<br>☐ edges<br>☐ vertices<br>☐ faces | It has...<br>☐ edges<br>☐ vertices<br>☐ faces | It has...<br>☐ edges<br>☐ vertices<br>☐ faces | It has...<br>☐ edges<br>☐ vertices<br>☐ faces |
|  |  |  |  |  |  |

## b. Shape Riddles

1. I have five flat faces. I have five vertices. Four of my faces are triangles and one is square. What shape am I?_____

2. I have one surface. My only surface is curved. I do not have any edges. What shape am I?

_____

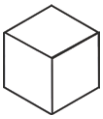
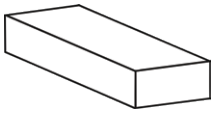
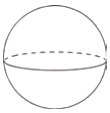
3. I have six faces. All of my faces are four-sided. I have eight vertices. What shape am I?

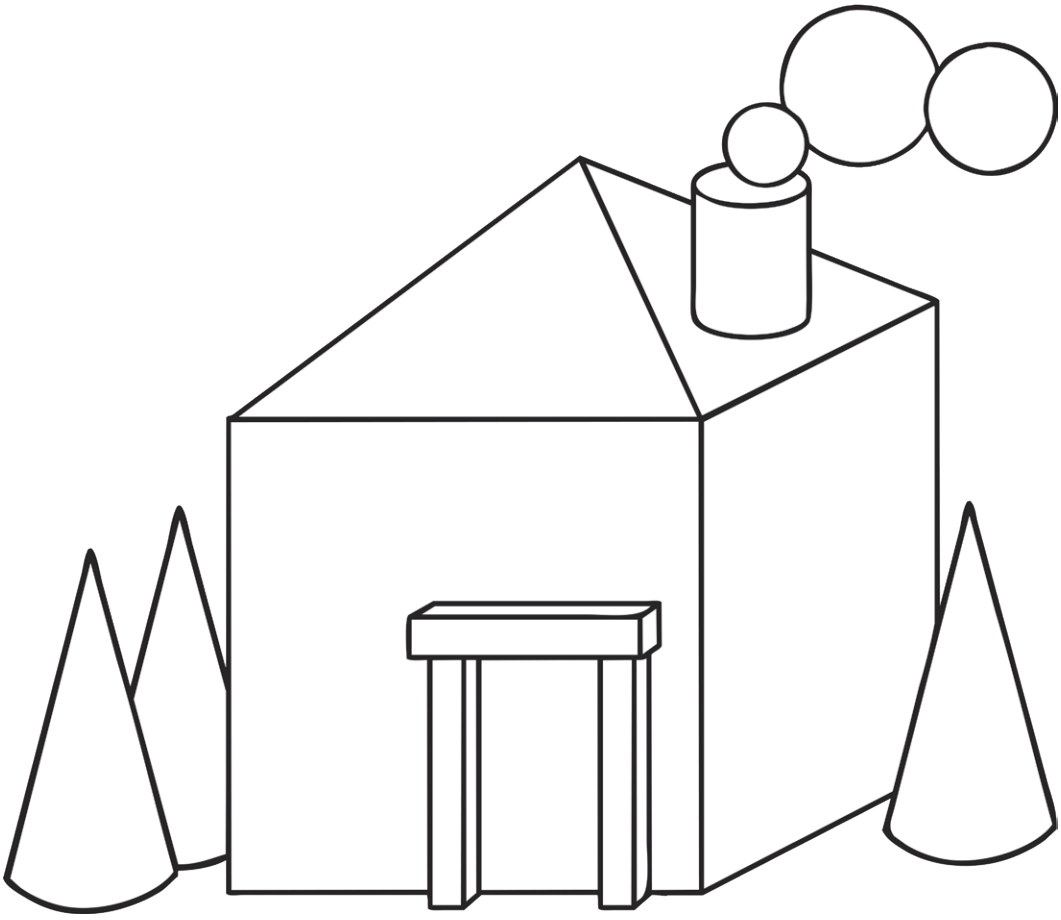
_____

4. I have one flat face. I have one curved face, ending in a point. I do not have any vertices. What shape am I? _____

**Parent Tip:** For many children, the best way to get their head around 3D shapes is to look for real-life examples and get hands on. Why not head outside on an **Outdoor 3D Shape Hunt** or use toothpicks and sticky tack (or something similar) with these **Skeleton Shapes Challenge Cards**?

**c. 3D Shape Colouring -** use the key to colour in the 3D shapes correctly.

| Key | | |
|---|---|---|
| **Shape** | **Name** | **Colour** |
|  | | pink |
|  | | orange |
|  | | green |
|  | | purple |
|  | | blue |
|  | | yellow |



# Place Value

Place value is all about how much each digit is worth within a number. A digit is any numeral from 0 to 9. When a digit is placed on a place value chart, like the one below, its value will change depending on which column it is in. Each column is ten times the value of the column to its right. For example, one thousand is ten times the value of one hundred (or ten hundreds make one thousand).

| Tm | M | Hth | Tth | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|---|
| Ten Millions | Millions | Hundred Thousands | Ten Thousand | Thousands | Hundreds | Tens | Ones | Tenths | Hundredths | Thousandths |
| 10 000 000 | 1 000 | 100 000 | 10 000 | 1000 | 100 | 10 | 1 | 0.1 | 0.01 | 0.001 |

For example, in the number 309 871.6, the digit 9 is in the thousands column. This means the 9 is worth **9 000** or **nine thousands**.

The zero in 309 871.6 is saying there are **no ten thousands**. If this zero wasn't there, the number would read 39 871.6 which would change the value of some of the digits. Zero acts as a **placeholder** in the number, making sure we read the number correctly and know the value of the other digits.

# Digit Values

**1.** What are the underlined digits worth in each of these numbers?

**a.** 1 000 <u>3</u>07

b. 8<u>8</u> 554 001

**c.** 30 625 55<u>7</u>.25

**d.** 2 410 803.3<u>6</u>1

**e.** 72 9<u>9</u>5 990

**f.** 9 <u>7</u>62 448.05

# Making Numbers

**2.** There are some numbers in the box below. Can you colour in the numbers you need to make the numbers in the table? The first one has been done for you as an example.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 70 000 000 | 200 | 40 | 9 | 600 000 | 70 000 | 5 | 8 000 |
| 40 000 000 | 80 | 5 000 | 700 | 2 000 000 | 600 | | |
| 40 000 | 20 | 5 000 000 | 500 000 | 8 | 100 | 3 000 000 | |
| 7 | 700 000 | 3 000 | 90 | | | | |

3 540 789 = **green**

70 605 628 = **yellow**

2 008 147 = **blue**

45 773 295 = **red**

**Parent Tip:** Encourage your child to make their own place value grid at home and write the numbers onto the grid. It's even better if you can laminate it or cover it in sticky back plastic, as this means they can write numbers on their grid and wipe them off again and again.

# Comparing Numbers

Place value is important when comparing numbers. We use symbols to compare numbers:

< This means 'is less than'

> This means 'is greater than'

= This means 'is equal to'

Let's compare 9 108 002 and 9 180 020. Which is the largest? It might help to put them in a place value chart.

| Tm | M | Hth | Tth | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|---|
| Ten Millions | Millions | Hundred Thousands | Ten Thousand | Thousands | Hundreds | Tens | Ones | Tenths | Hundredths | Thousandths |
| | 9 | 1 | 0 | 8 | 0 | 0 | 2 | | | |
| | 9 | 1 | 8 | 0 | 0 | 2 | 0 | | | |

When comparing numbers, it's important to look at the digits with the largest value first and work down to the digits with the lowest value.

In this comparison, both numbers have 9 in the millions column and 1 in the hundred thousands column. However, when we get to the ten thousands column, one number has 0 and one number has 8. This means 9 180 020 is greater than 9 108 002.

**9 180 020 > 9 108 002**

# Comparing Numbers

**1.** Can you compare these numbers using < > or =? Use the place value chart to help you.

**a.** 4 816 352 4 860 002

**b.** 56 723 405 56 723 045

**c.** 1 034 572 1 304 572

**d.** 90 671 002 90 671 002

**e.** 2 945 100 2 945 001

**f.** 6 902 892 692 892

**Parent Tip:** Numbers are everywhere. Encourage your child to compare sport scores, amounts of money or numbers in the news.

# Ordering Numbers

Ordering means putting numbers in a list from highest to lowest or lowest to highest. You'll need your understanding of place value for this too. Here is a useful process to follow when ordering numbers:

• Find the numbers with the **smallest number of digits**. Order these looking at the **highest place value digit** first.

• Order the numbers with the **next lowest number of digits**, looking at the **highest place value digit** first.

• Repeat until you have ordered all the numbers.

Let's have a go with this group of numbers.

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| 1 011 221 | 112 101 | 2 120 012 | 1 101 001 |

• Find the numbers with the **smallest number of digits**. Order these looking at the **highest place value digit** first.

All the numbers have seven digits, apart from one number, which has six digits. This number must be the smallest. It has no millions.

**112 101**

• Order the numbers with the **next lowest number of digits**, looking at the **highest place value digit** first.

The other numbers all have the same number of digits, so let's look at the highest place value digit.

**1** 011 221 **2** 120 012 **1** 101 001

One number has two millions, while the other two numbers have one million. This means 2 120 012 must be the largest number.

We only have two numbers left to compare. Next, let's look at the next highest place value digit; the hundred thousands.

1 **0**11 221 1 **1**01 001

One number has zero in this column and one number has one hundred thousand. This must mean 1 101 001 is the second largest number.

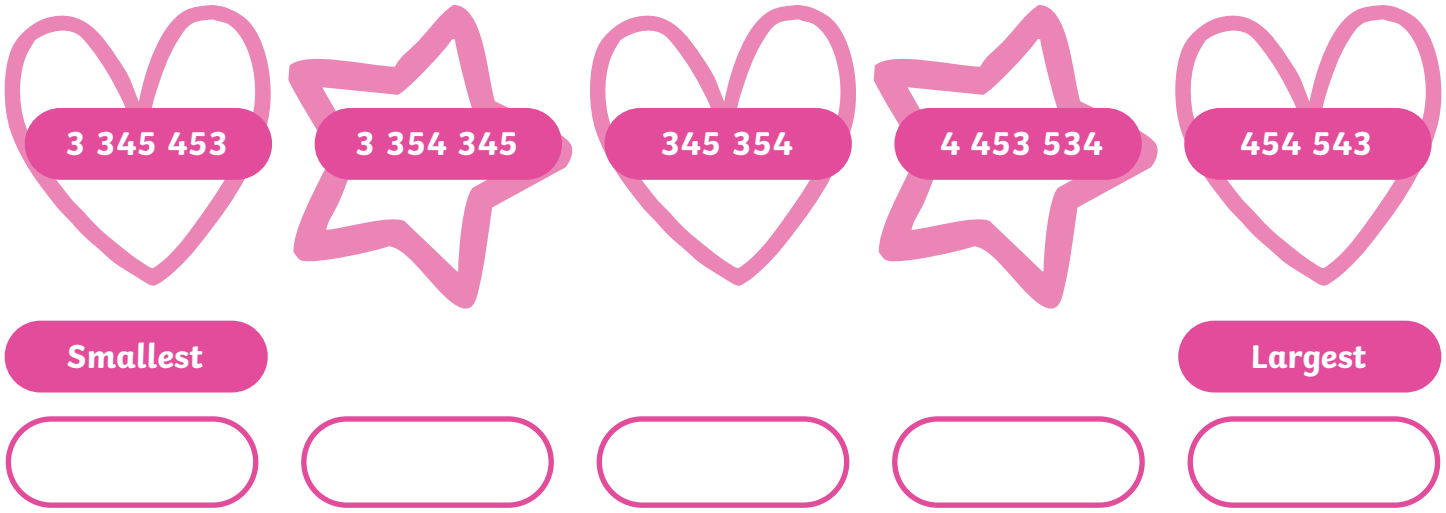
**Here is the final order:**

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| 112 101 | 1 011 221 | 1 101 001 | 2 120 012 |
| **Smallest** | | | **Largest** |

# Ordering Numbers

**1.** Can you use the same process to order these sequences of numbers?

**a.**




Smallest _____ _____ _____ _____ Largest

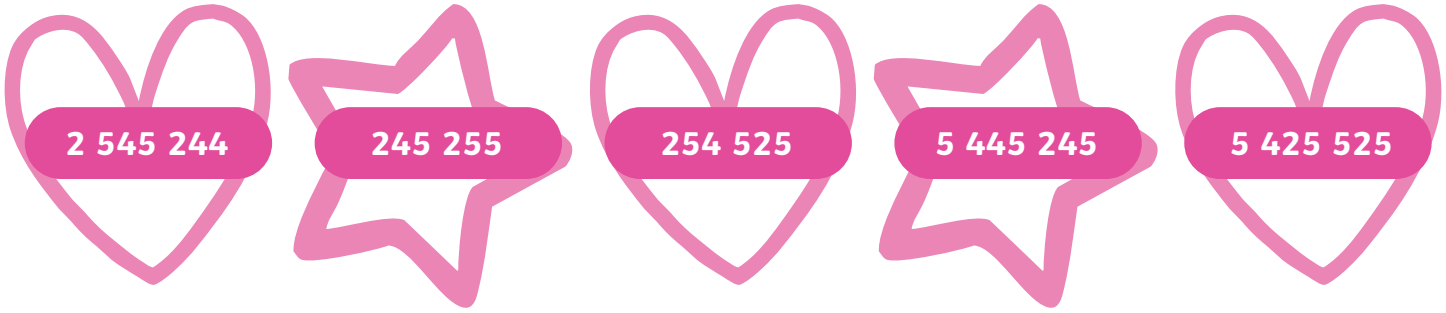
**b.**


Smallest _____ _____ _____ _____ Largest

**c.**


Smallest _____ _____ _____ _____ Largest

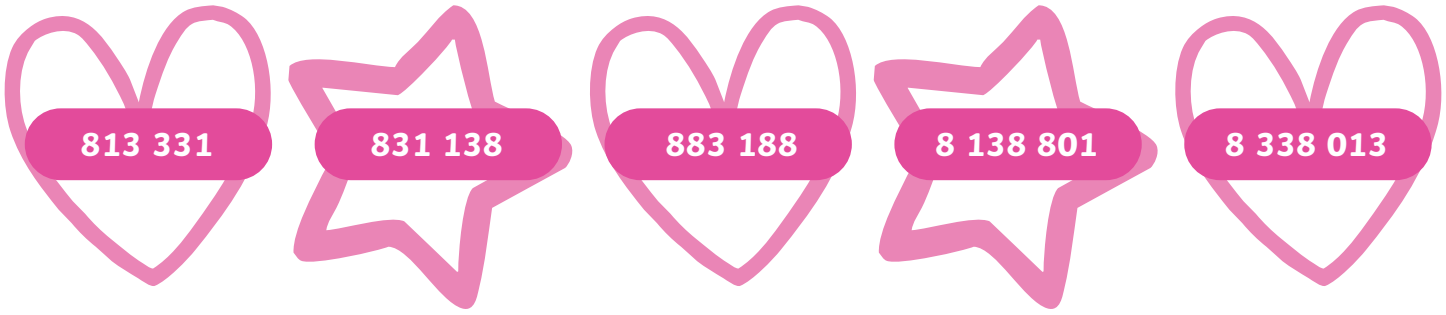
d.




Smallest

Largest

e.




Smallest

Largest

f.


Smallest

Largest

**Parent Tip:** Numbers are everywhere. Encourage your child to compare sport scores, amounts of money or numbers in the news.

# Rounding

Rounding means making a number simpler but keeping its value close to what it was. To round a number, we take one or more of its place values and adjust them to make the whole number easier to work with. This is good for rough calculations or estimations. You can round a number to varying degrees of accuracy, such as to the nearest 10, 100 or 1 000.

Here are three main steps to follow when rounding numbers:

• First, understand what you are rounding to. This is the 'rounding digit'. Are you rounding to the nearest 10? If so, the rounding digit is the tens digit. Are you rounding to the nearest 1000? If so, the rounding digit is the thousands digit.

• To round, we look at the digit to the right of the rounding digit. If the digit is **0, 1, 2, 3** or **4**, we **round down**. This means the rounding digit stays the same.

• If the digit to the right of the rounding digit is **5, 6, 7, 8 or 9**, we **round up**. This means the rounding digit increases by one.

**Here is an example:**

**Round 53 554 981 to the nearest hundred thousand.**

Let's put it in a place value chart. The rounding digit is the hundred thousands column because we're rounding to the nearest hundred thousand.

| Tm | M | Hth | Tth | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|---|
| Ten Millions | Millions | Hundred Thousands | Ten Thousand | Thousands | Hundreds | Tens | Ones | Tenths | Hundredths | Thousandths |
| 5 | 3 | 5 | 5 | 4 | 9 | 8 | 1 | | | |

We then need to look at the digit one place to the right of the rounding digit - the ten thousands column.

| Tm | M | Hth | Tth | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|---|
| Ten Millions | Millions | Hundred Thousands | Ten Thousand | Thousands | Hundreds | Tens | Ones | Tenths | Hundredths | Thousandths |
| 5 | 3 | 5 | 5 | 4 | 9 | 8 | 1 | | | |

There are five ten thousands - five or more - so we **round up**. The rounding digit (the hundred thousands) increases by one. The following digits can all become zero.

| Tm | M | Hth | Tth | Th | H | T | O | t | h | th |
|---|---|---|---|---|---|---|---|---|---|---|
| Ten Millions | Millions | Hundred Thousands | Ten Thousand | Thousands | Hundreds | Tens | Ones | Tenths | Hundredths | Thousandths |
| 5 | 3 | 5 | 5 | 4 | 9 | 8 | 1 | | | |
| 5 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | | | |

Therefore, 53 554 981 rounded to the nearest hundred thousand is 53 600 000.

# Rounding Numbers

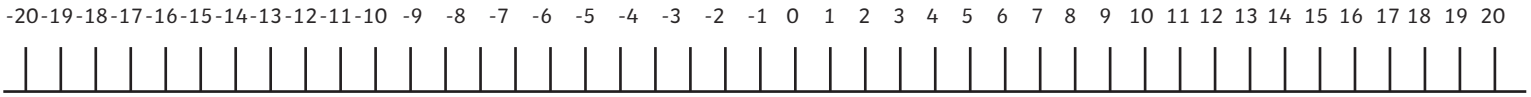
**1.** Can you round these numbers to the required degree of accuracy?

| Number | Round to the nearest 10 | Round to the nearest 100 | Round to the nearest 1 000 | Round to the nearest 10 000 | Round to the nearest 100 000 | Round to the nearest 100 000 |
|---|---|---|---|---|---|---|
| 5 658 485 | | | | | | |
| 34 745 123 | | | | | | |
| 71 082 664 | | | | | | |
| 2 901 439 | | | | | | |
| 6 200 182 | | | | | | |

**Parent Tip:** If your child has two different colour pens or pencils, they could circle the rounding digit in one colour, then the digit to the right in another colour. This can help focus their attention on the information that matters, rather than becoming overwhelmed by large numbers.

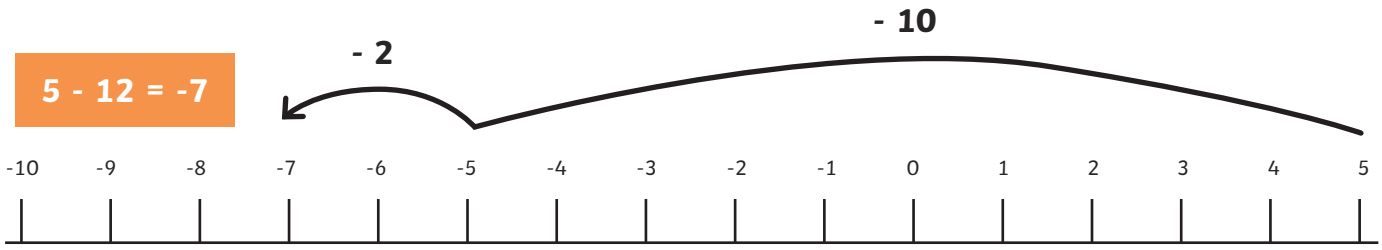
# Negative Numbers

When you count back past zero, you go into negative numbers. Positive numbers are more than zero, whereas negative numbers are less than zero.




In real life, we use negative numbers when talking about temperature, depths below sea level and sometimes money too.

To complete some calculations, we need to know how to count with negative numbers. For example, we could use this number line to help us calculate 5 - 12.



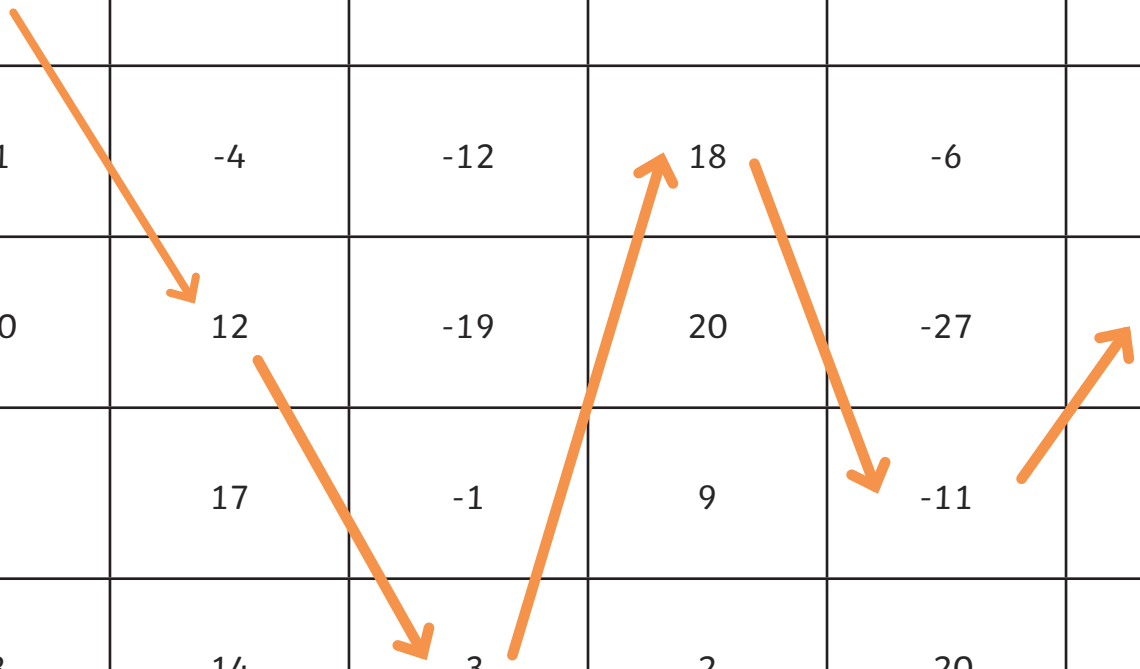
# Negative Number Maze

**1.** Look at the table below. There are instructions in the top row; these tell you the difference required between a number in one column and the new number in the next column. Find the appropriate answer in the next column and join them with a line. The first sequence has been done for you as an example.

See if you can complete the other sequences, using the numbers in the start column.

Try using a different colour for each sequence.

| Start | +6 | -15 | +21 | -29 | +24 |
|---|---|---|---|---|---|
| 6 | 3 | 2 | 23 | -9 | -3 |
| 11 | -4 | -12 | 18 | -6 | 4 |
| -10 | 12 | -19 | 20 | -27 | 13 |
| 8 | 17 | -1 | 9 | -11 | 18 |
| -3 | 14 | -3 | 2 | -20 | 15 |



**Parent Tip:** Encourage your child to create a number line or draw one on a mini whiteboard for these calculations. It can help to visualise which way they're counting for addition and subtraction questions involving negative numbers.

# Units of Length

### Length

We use the metric system in the UK, which means that the standard units of length are millimetres (mm), centimetres (cm), metres (m) and kilometres (km).

The metric system makes it easy to convert between each of the measurements because you just need to be able to multiply and divide by 10, 100 and 1000. The table below shows the conversion rates:

1000m = 1km

100cm = 1m

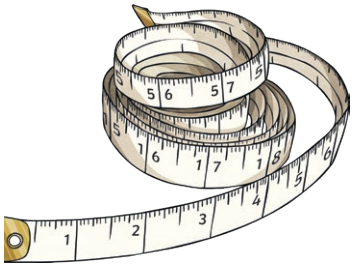
10mm = 1cm

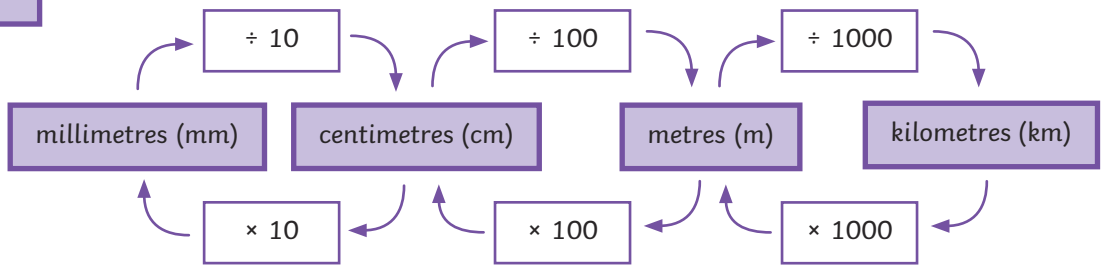
$\frac{1}{2}$m = 0.5m = 50cm

$\frac{1}{4}$m = 0.25m = 25cm

$\frac{3}{4}$ m = 0.75m = 75cm

$\frac{1}{10}$m = 0.1m = 10cm






## Matching Equivalent Lengths

**1.** Match up the equivalent units of length:

| | |
|---|---|
| **1620m** | **1.45m** |
| **162cm** | **1.62km** |
| **1425m** | **0.5m** |
| **145cm** | **1.62m** |
| **50cm** | **0.5km** |
| **500m** | **1.425km** |

**2.** Complete the table to identify the equivalent lengths:

| Millimetres | Centimetres |
|---|---|
| | 1.5cm |
| 20mm | |
| | 75.2cm |
| 460mm | |
| | 86.1cm |

**3.** Using the conversion chart below, can you convert each of the imperial measures to an approximate metric measurement?

1 inch = 2.5cm

1 foot = 30cm

12 inches = 1 foot

| Millimetres | Centimetres |
|---|---|
| 2in | cm |
| | 60cm |
| 1ft 2in | cm |
| ft in | 1m |

**Parent Tip:** To convert from inches to centimetres, you need to multiply by 2.5 and to convert from centimetres to inches, you need to divide by 2.5. This can be something you do in real life too. If you see a measurement written down, ask your child to convert it.

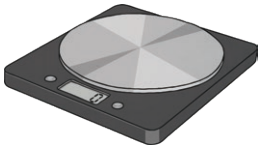
# Units of Mass

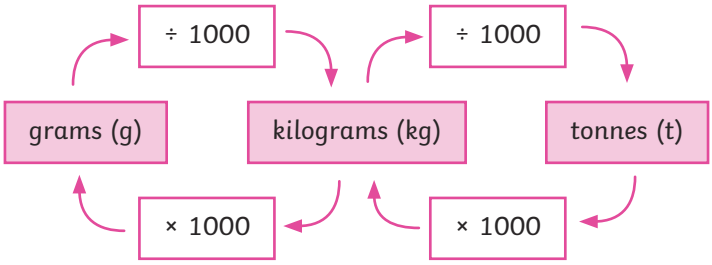
When using the technical term 'mass', it means how much something weighs. The metric units of mass are milligrams (mg), grams (g), kilograms (kg) and tonnes (t).

**1000kg = 1t**

**1000g = 1kg**

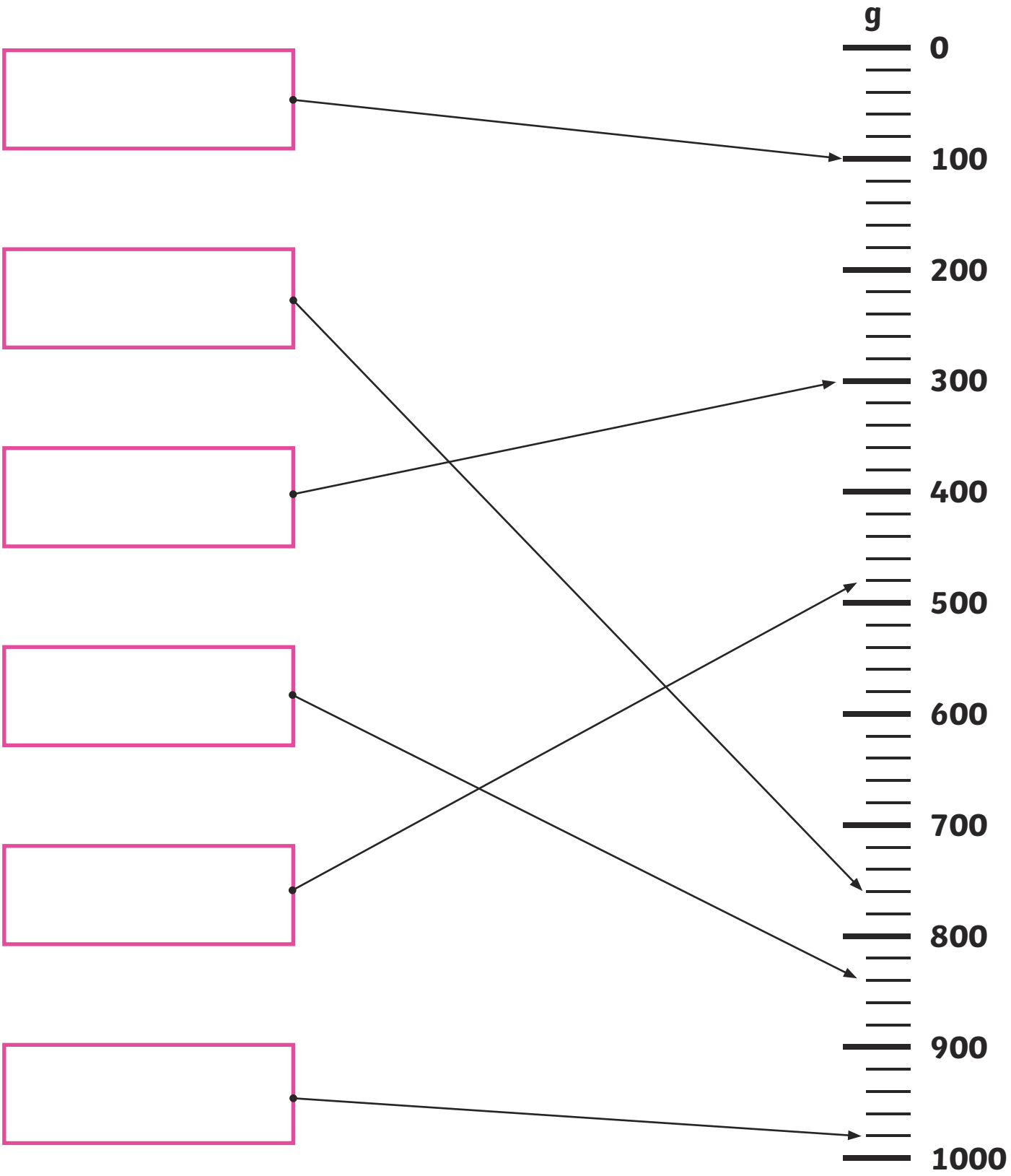
**1000mg = 1g**





# Reading the Scales

**1.** The scale shows 1 kilogram; each large division is 100 grams and each small division is 20 grams. Write in the reading for each of the arrows.



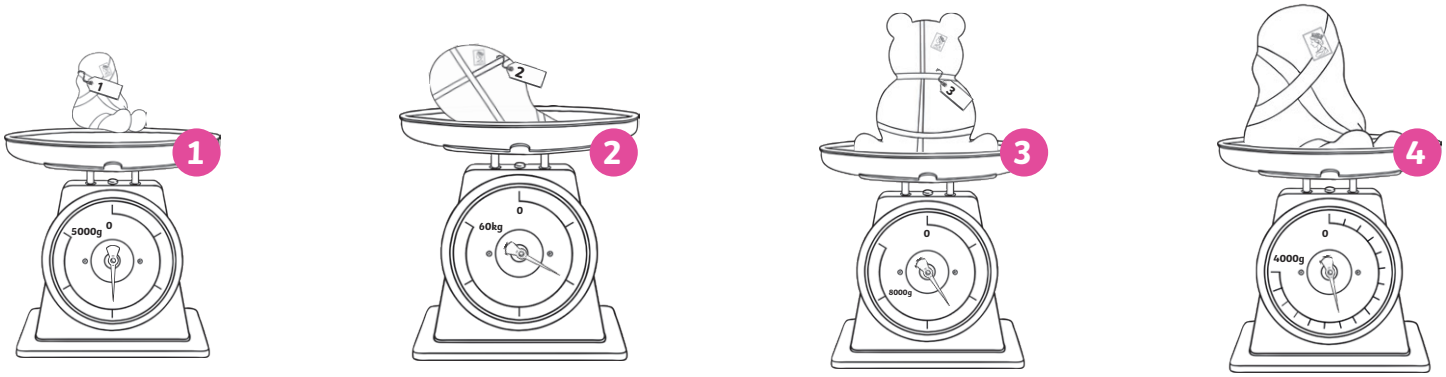
**2.** This biscuit recipe has been written in imperial measures, but the scales at home are metric. Can you convert each measurement into metric units using these approximate conversions?

1oz = 25g

16oz = 1lb

| Imperial | Metric |
|---|---|
| 3oz softened butter | |
| 3oz soft brown sugar | |
| 5oz plain flour | |
| 2oz sultanas | |

**3.** Look carefully at the scales. Write the mass shown on these scales, using both kilograms and grams:

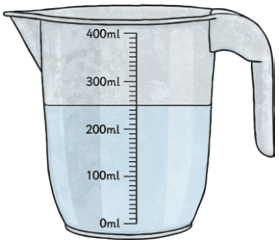


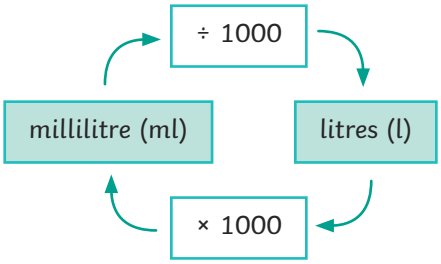

| Parcel | Mass in grams (g) | Mass in kilograms (kg) |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

**Parent Tip:** To convert from kilograms to grams, you must multiply by 1000. To convert from grams to kilograms, you must divide by 1000. The best way to practise mass is through baking at home; use recipes to convert from grams to kilograms or even ounces to grams.

# Units of Volume

Volume is sometimes called capacity; either way, it is the unit which is most often used to measure liquid. The metric units of volume or capacity are millilitres and litres. There are 1000 millilitres in 1 litre.




## Equivalent Volume

**1.** Match up the equivalent units of volume:

| | |
|---|---|
| 1840ml | 1.425l |
| 162ml | 3.5l |
| 1425ml | 5.45l |
| 145ml | 1.84l |
| 5450ml | 0.162l |
| 3500m | 0.145l |

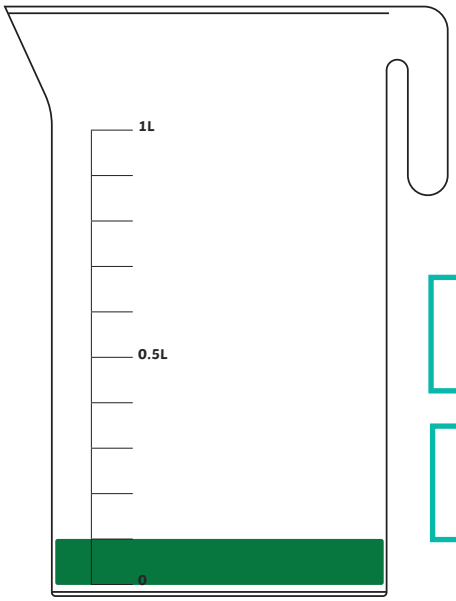
**b.** Put these measurements in order from smallest to largest:

1.2l 250ml 1.75l 1600ml 750ml

| Smallest | | | | Largest |
|---|---|---|---|---|
| | | | | |

**c.** Look carefully at the scales on each of the measuring jugs. Write the answer in both ml and l.

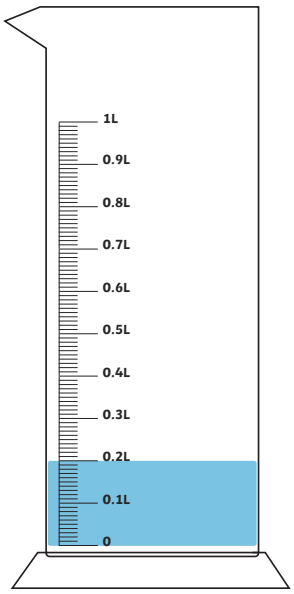
Slime of Toad




ml

l

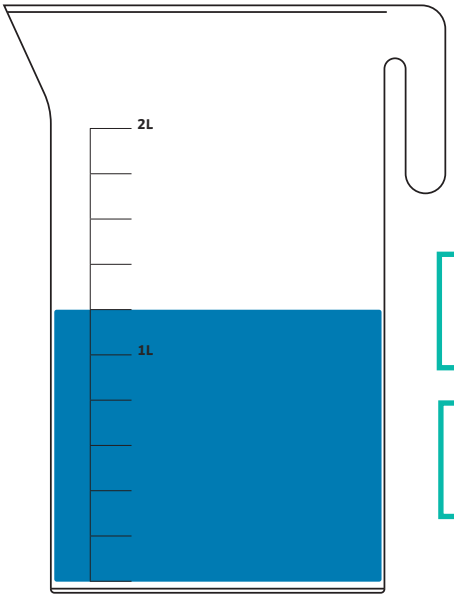
Unicorn Tears




ml

l

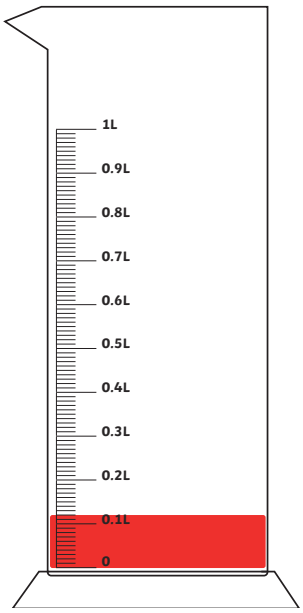
Spider Venom




ml

l

Bat Blood




ml

l

**Parent Tip:** When reading measurements, it's really important to check the scale being used. That means you must look carefully at the numbers on the side and work out what each line represents. If there are numbers missing, you need to look at the numbers you do have, count the number of little lines between each number then divide what you know by the number of little lines.

For example, if there are 5 lines between 0 and 1, you must divide 1 by 5. Each little line in this case represents 0.2.

# Units of Time

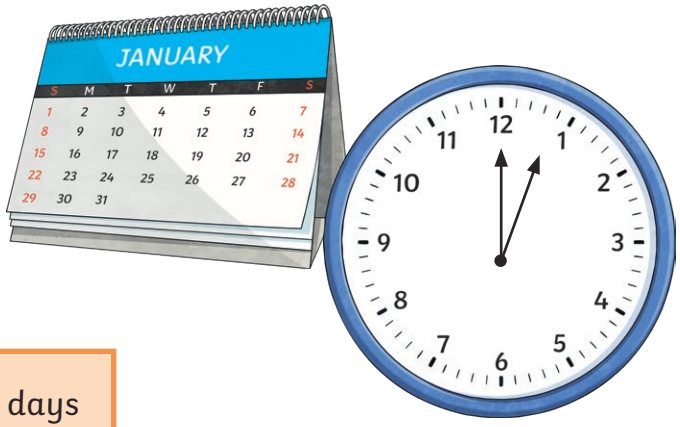
Telling the time is one skill that is learnt at a young age, but did you know that time is also classed as a measurement? It makes sense when you think about it. Your child should know how many minutes there are in an hour, that there are 24 hours in a day, etc. They will also need to be able to convert between minutes and hours and work out how long things take to do.

**Minute** 1 minute = 60 seconds

**Hour** 1 hour = 60 minutes

**Day** 1 day = 24 hours

**Week** 1 week = 7 days




**Year** 1 year = 12 months = 52 weeks = 365 days

A common question might ask:

If Ashley left her home at 8am and the journey takes $\frac{3}{4}$ of an hour, what time does she arrive at school?

To answer the question, you must know how many minutes there are in an hour, how to work out how many minutes in $\frac{3}{4}$ hour and how to add time. A simple question, but quite a few stages are needed to answer it.

**a.** Use your knowledge of time to answer these questions:

| | |
|---|---|
| How many minutes are there in 1 and half hours? | |
| How many minutes is 135 seconds? | |
| 240 minutes is equivalent to how many hours? | |
| How many minutes are equivalent to three quarters of an hour? | |
| How many seconds are there in 3 minutes? | |

**b.** Joshua watches his favourite programme. It starts at 4 o'clock and finishes at quarter to 5. The adverts in the middle were 5 minutes long. How long was the television programme?

**c.** A year 6 class has 5 maths lessons during the week. Each lesson lasts 1 hour and 15 minutes. How many hours and minutes will they have maths lessons in a seven-week half term?

**Parent Tip:** Time questions are much easier to answer if your child is good at telling the time. Practise this skill often at home using both analogue and digital clocks. Great questions to ask are: How long is it until lunch? How long is this programme? What time will it finish? etc.

# Measurement Problems

By the end of year 6, you will be expected to be able to solve problems involving units of measure. The answers you give can be up to three decimal places. To answer these questions, you will need to use addition, subtraction, multiplication and division. There may also be problems that need you to convert units. For example:

56cm + 1.5m = 206cm

56cm + 1.5m = 2.06m

A key skill when solving problems is to estimate the answer to check whether the calculation you have made is sensible. For instance, 56cm + 1.5m cannot possibly equal 57.5m or indeed 5750cm. This will help you to see where you have gone wrong and solve it correctly.

When solving problems, **RUCSAC** is a good technique to use.


## Read

Read the question.
What is the important information?

## Understand

Understand the question.
What do you need to find out?

## Choose

Choose the correct method of calculation and operation(s).

## Solve

Solve the problem.
Make sure you follow the steps.

## Answer

Answer the question.
What were you meant to find out?

## Check

Check your answer.
Use the inverse to check your working out.

**a.** Jamie is baking scones. The recipe says that 455g of flour will make 8 scones. How much flour will they need to make 24 scones? Write your answer in kilograms.

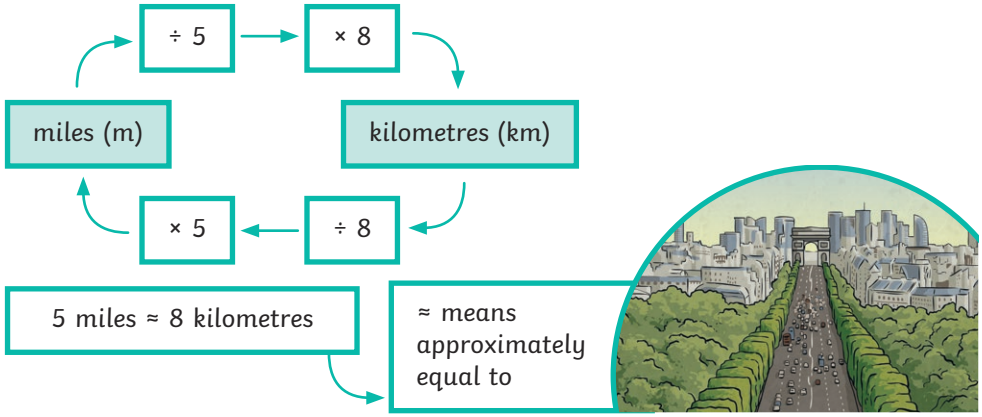
**b.** Mohammed is training for a swimming race. He swims 1825m on Saturday and 1750m on Sunday. How many kilometres did he swim altogether?

**c.** Sasha's class is washing cars to raise money for charity. They use 11.5l of water to wash 2 cars. How much water is needed to wash 6 cars? Write your answer in litres.

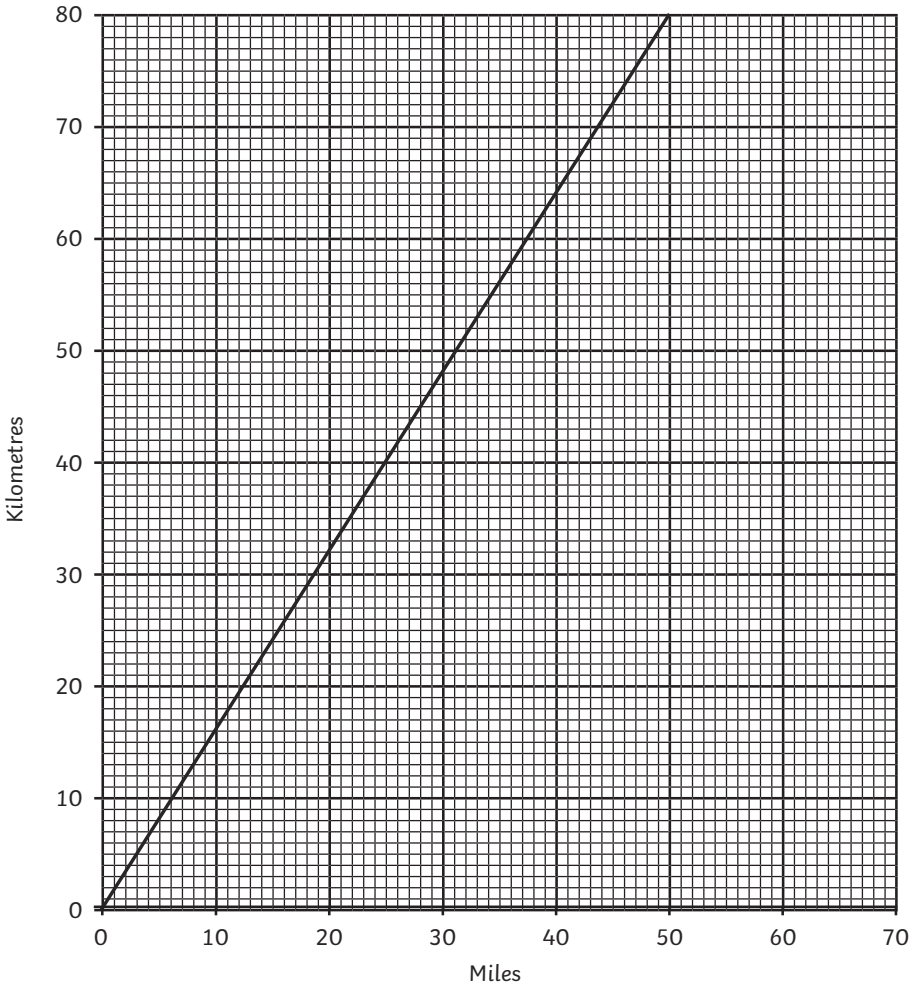
**Parent Tip:** Some problems have two or even three steps. Encourage your child to work out each step at a time and write down their process. In tests, children get marks for using the right process, even if the answer is wrong!

# Converting Distance

Although we use the metric system in the UK, we still measure distance in miles. For that reason, children in year 6 are taught how to convert from miles to kilometres and vice versa. You will be expected to know that there are 1.6 kilometres in a mile and know how to use this information to convert distances.




## a. Graph to Convert Miles and Kilometres




Use the conversion graph to convert these measurements.

20 miles = ☐

45 miles = ☐

15 miles = ☐

35 miles = ☐

**b.** Can you round these numbers to the required degree of accuracy?

| Distance in Miles | Distance in Kilometres |
|---|---|
| | 1.6km |
| 2 miles | |
| | 4.8km |
| 5 miles | |
| | 16km |
| 20 miles | |

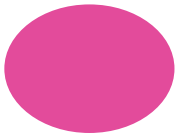
**c.** This map shows the capital cities of Great Britain and Northern Ireland.


| | |
|---|---|
| The distance between London and Cardiff is approximately 150 miles. What is the distance in kilometres to the nearest whole number? | |
| The distance from Edinburgh to Belfast is approximately 190 miles. What is the distance in kilometres to the nearest whole number? | |
| The distance from Cardiff to Edinburgh is approximately 400 miles. What is the distance in kilometres to the nearest whole number? | |

**Parent Tip:** When converting miles to kilometres, you must divide the number of miles by 1.6. When converting kilometres to miles, you must multiply the number of kilometres by 1.6. Alternatively, you can use the approximation that 5 miles is about 8 kilometres for a quick conversion. Use this when exercising together or if you are on a car journey to practise in a real life situation.

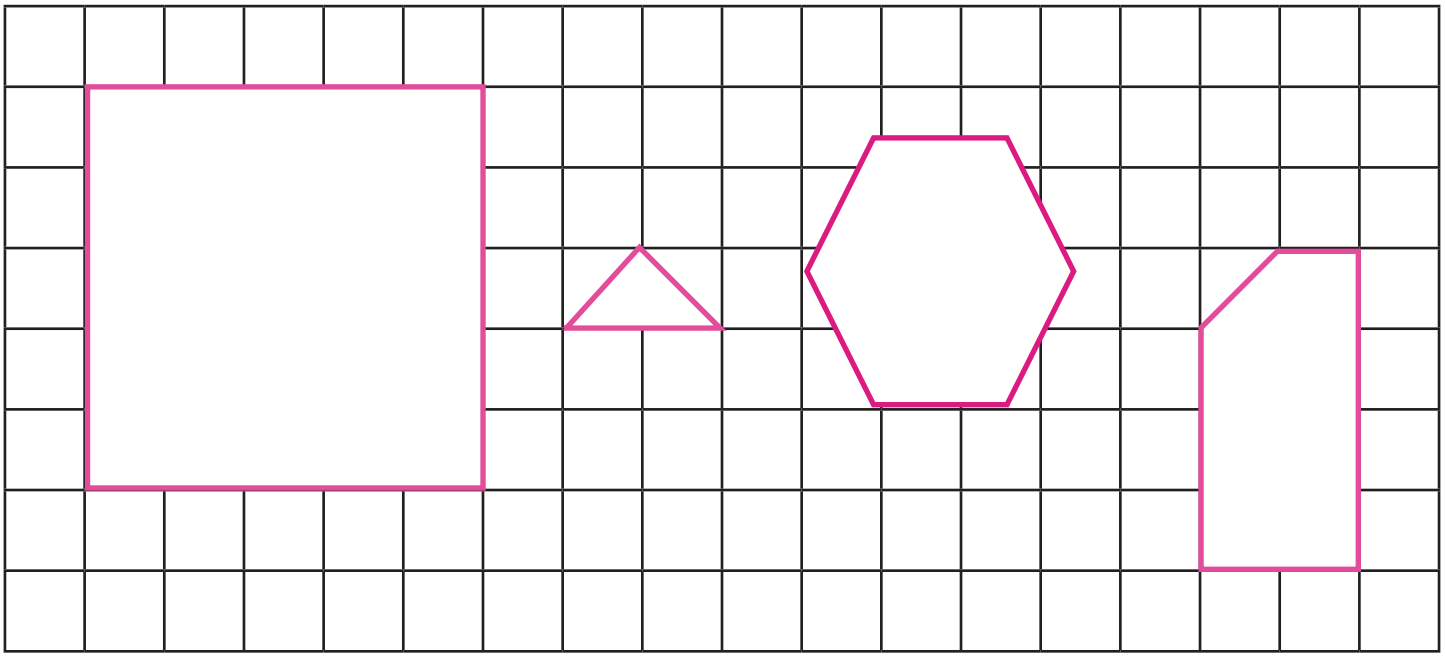
# 2D Shapes - Answers

**a.**

| Name | Sides | Corners |
|---|---|---|
| triangle  | 3 | 3 |
| circle  | 1 | 0 |
| square  | 4 | **4** |
| rectangle  | 4 | 4 |
|  | 5 | 5 |
| hexagon  | 6 | 6 |
|  | 1 | 0 |
| rhombus  | 4 | 4 |
| trapezium  | **4** | 4 |
| parallelogram  | 4 | 4 |

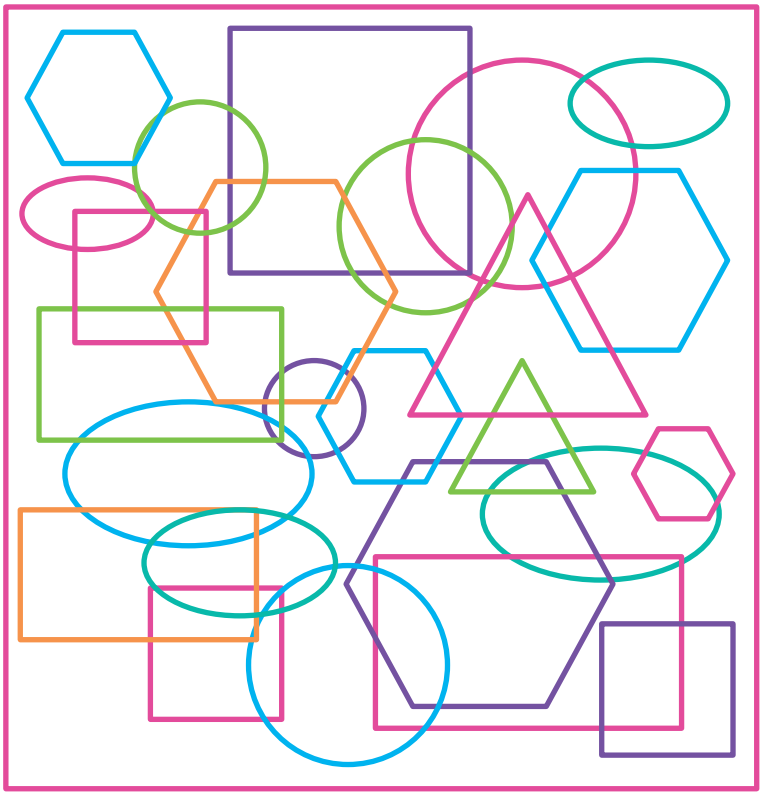
**b. Drawing Shapes** - on the grid below, draw:

| | |
|---|---|
| A square with sides of 5cm. | A triangle with a base of 2cm. |
| A regular hexagon. | An irregular pentagon. |



**c. Lateral Thinking Puzzle**

These shapes are in a muddle! Can you count how many of each shape is in this mess? As a challenge, try counting how many shapes of each colour you can see too.

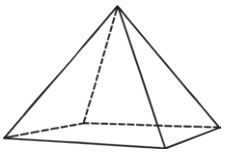
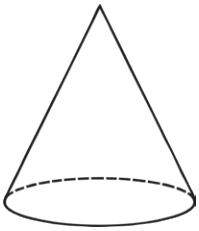
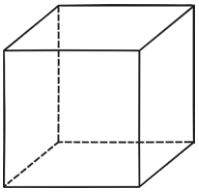
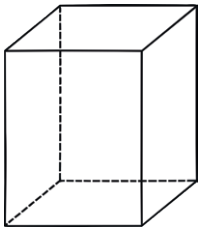
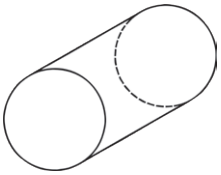


**Green:** 4
**Purple:** 4
**Pink:** 7
**Blue:** 5
**Teal:** 3
**Orange:** 2

**Square:** 4
**Rectangle:** 3
**Circle:** 5
**Oval:** 5
**Triangle:** 2
**Hexagon:** 6

# 3D Shapes - Answers

**a. Properties of 3D Shapes**

| sphere | pyramid | cone | cube | cuboid | cylinder |
|---|---|---|---|---|---|
| It has... | It has... | It has... | It has... | It has... | It has... |
| 0 edges | 8 edges | 1 edges | 12 edges | 12 edges | 2 edges |
| 0 vertices | 5 vertices | 1 vertices | 8 vertices | 8 vertices | 0 vertices |
| 1 faces | 5 faces | 2 faces | 6 faces | 6 faces | 3 faces |
|  |  |  |  |  |  |

**b. Shape Riddles**

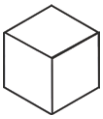
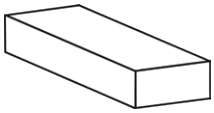
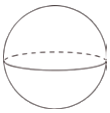
1. I have five flat faces. I have five vertices. Four of my faces are triangles and one is square. What shape am I? **Square-based pyramid**

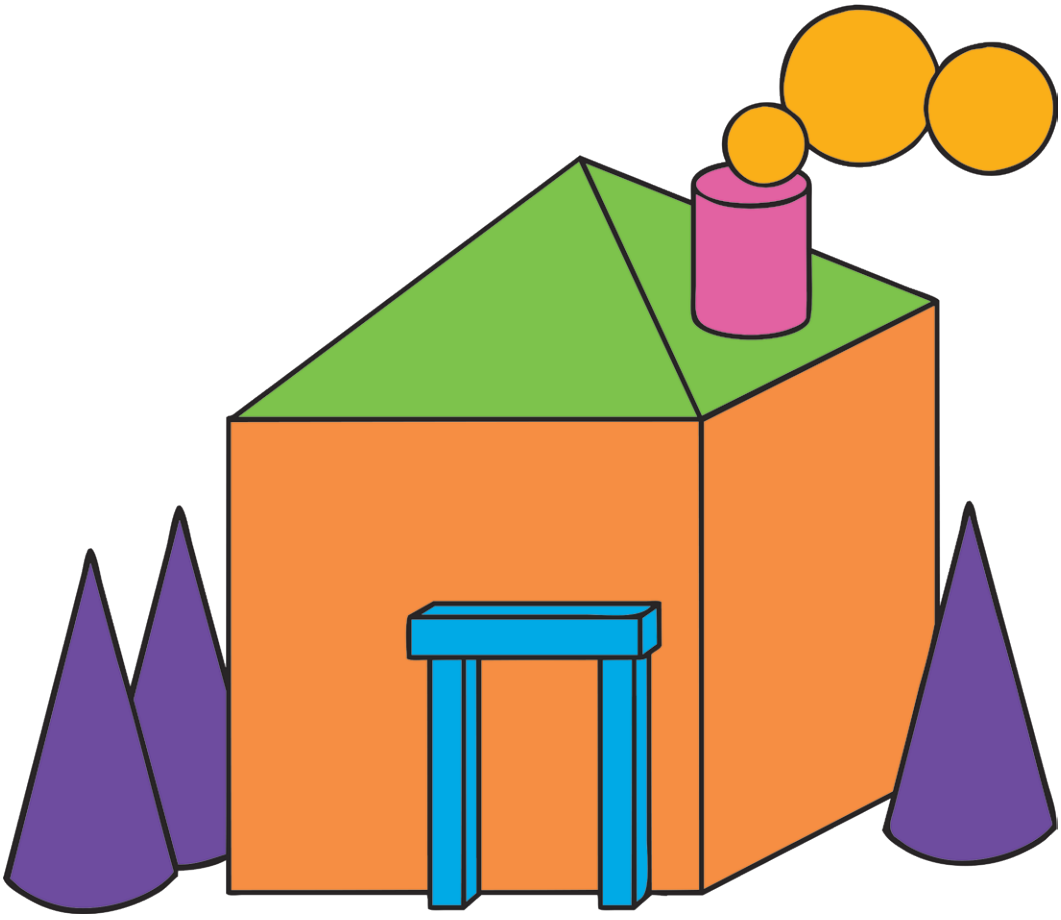
2. I have one surface. My only surface is curved. I do not have any edges. What shape am I? **Sphere**

3. I have six faces. All of my faces are four-sided. I have eight vertices. What shape am I? **Cube or Cuboid**

4. I have one flat face. I have one curved face, ending in a point. I do not have any vertices. What shape am I? Cone

**c. 3D Shape Colouring** - use the key to colour in the 3D shapes correctly.

| Key | | |
|---|---|---|
| **Shape** | **Name** | **Colour** |
|  | Cylinder | **pink** |
|  | Cube | **orange** |
|  | Square-based pyramid | **green** |
|  | Cone | **purple** |
|  | Cuboid | **blue** |
|  | Sphere | **yellow** |



# Place Value - Answers

## Digit Values - Answers

**1.** What are the underlined digits worth in each of these numbers?

a. three hundreds or 300

b. eight millions or 8 000 000

c. seven ones or 7

d. six hundredths or 0.06

e. nine ten thousands or 90 000

f. seven hundred thousands or 700 000

## Making Numbers - Answers

**2.** There are some numbers in the box below. Can you colour in the numbers you need to make the numbers in the table? The first one has been done for you as an example.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 70 000 000 | 200 | 40 | 9 | 600 000 | 70 000 | 5 | 8 000 |
| 40 000 000 | 80 | 5 000 | 700 | 2 000 000 | 600 | | |
| 40 000 | 20 | 5 000 000 | 500 000 | 8 | 100 | 3 000 000 | |
| 7 | 700 000 | 3 000 | 90 | | | | |

3 540 789 = **green**

70 605 628 = **yellow**

2 008 147 = **blue**

45 773 295 = **red**

# Comparing Numbers - Answers

Can you compare these numbers using < > or =? Use the place value chart to help you.

a. 4 816 352 < 4 860 002

b. 56 723 405 > 56 723 045

c. 1 034 572 < 1 304 572

d. 90 671 002 = 90 671 002

e. 2 945 100 > 2 945 001

f. 6 902 892 > 692 892

# Ordering Numbers - Answers

**1.** Can you use the same process to order these sequences of numbers?

**a.**

| 3 345 453 | 3 354 345 | 345 354 | 4 453 534 | 454 543 |
|---|---|---|---|---|

| Smallest | | | | Largest |
|---|---|---|---|---|
| 345 354 | 454 543 | 3 345 453 | 3 354 345 | 4 453 534 |

**b.**

| 707 700 | 7 770 007 | 7 077 070 | 7 707 700 | 770 700 |
|---|---|---|---|---|

| Smallest | | | | Largest |
|---|---|---|---|---|
| 707 700 | 770 700 | 7 077 070 | 7 707 700 | 7 770 007 |

**c.**

| 9 962 269 | 9 629 296 | 6 269 966 | 996 229 | 6 296 692 |
|---|---|---|---|---|

| Smallest | | | | Largest |
|---|---|---|---|---|
| 9 962 269 | 9 629 296 | 6 296 692 | 6 269 966 | 996 229 |

**d.**

2 545 244 | 245 255 | 254 525 | 5 445 245 | 5 425 525

Smallest | Largest

245 255 | 254 525 | 2 545 244 | 5 425 525 | 5 445 245

**e.**

813 331 | 831 138 | 883 188 | 8 138 801 | 8 338 013

Smallest | Largest

8 338 013 | 8 138 801 | 883 188 | 831 138 | 813 331

**f.**

1 110 001 | 1 111 010 | 111 110 | 1 110 100 | 1 101 001

Smallest | Largest

1 111 010 | 1 110 100 | 1 110 001 | 1 101 001 | 111 110

# Rounding Numbers - Answers

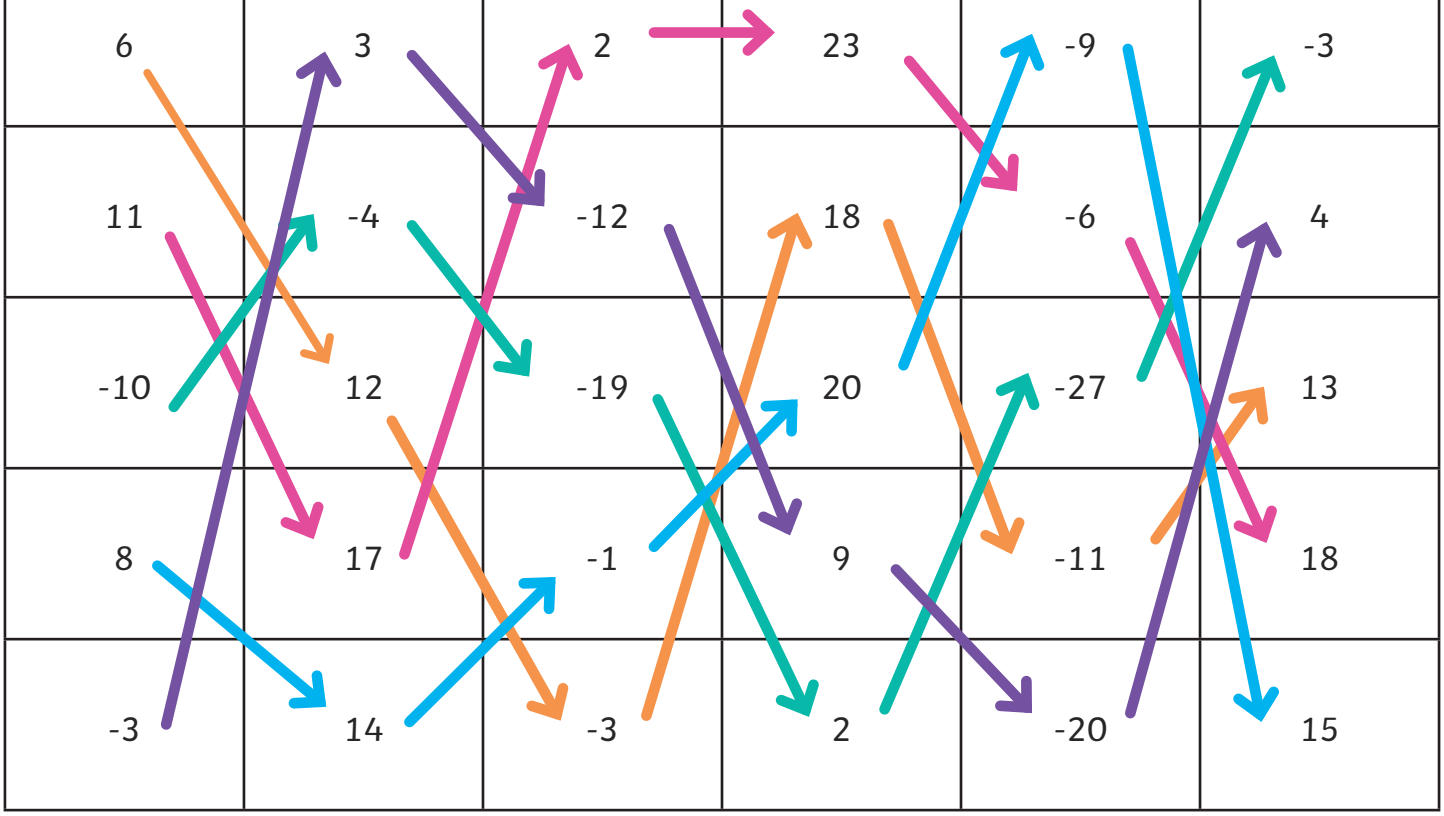
Can you round these numbers to the required degree of accuracy?

| Number | Round to the nearest 10 | Round to the nearest 100 | Round to the nearest 1 000 | Round to the nearest 10 000 | Round to the nearest 100 000 | Round to the nearest 100 000 |
|---|---|---|---|---|---|---|
| **5 658 485** | 5 658 490 | 5 658 500 | 5 658 000 | 5 660 000 | 5 700 000 | 6 000 000 |
| **34 745 123** | 34 745 120 | 34 745 100 | 34 745 000 | 34 750 000 | 34 700 000 | 35 000 000 |
| **71 082 664** | 71 082 660 | 71 082 700 | 71 083 000 | 71 080 000 | 71 100 000 | 71 000 000 |
| **2 901 439** | 2 901 440 | 2 901 400 | 2 901 000 | 2 900 000 | 2 900 000 | 3 000 000 |
| **6 200 182** | 6 200 180 | 6 200 200 | 6 200 000 | 6 200 000 | 6 200 000 | 6 000 000 |

# Negative Number Maze - Answers

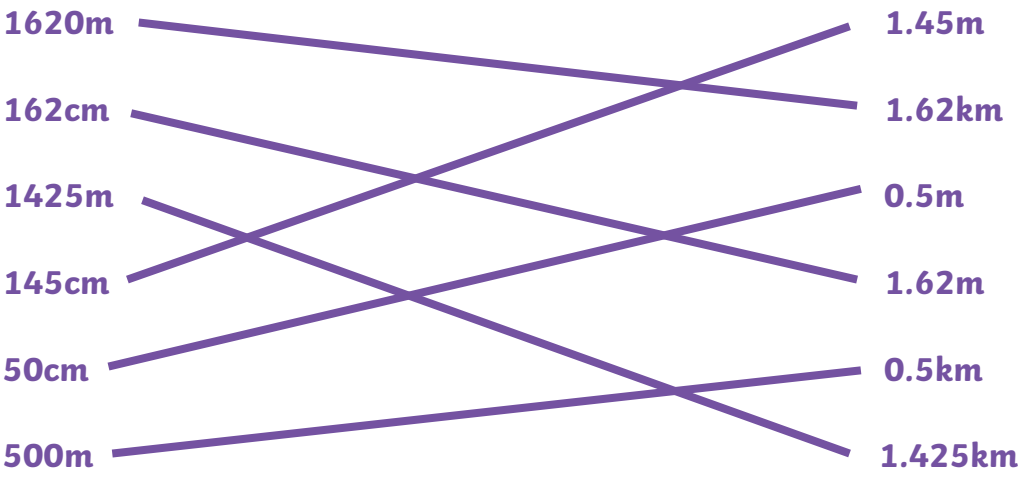
Look at the table below. There are instructions in the top row; these tell you the difference required between a number in one column and the new number in the next column. Find the appropriate answer in the next column and join them with a line. The first sequence has been done for you as an example.

| Start | +6 | -15 | +21 | -29 | +24 |
|---|---|---|---|---|---|
| 6 | 3 | 2 | 23 | -9 | -3 |
| 11 | -4 | -12 | 18 | -6 | 4 |
| -10 | 12 | -19 | 20 | -27 | 13 |
| 8 | 17 | -1 | 9 | -11 | 18 |
| -3 | 14 | -3 | 2 | -20 | 15 |



# Matching Equivalent Lengths - Answers

**1.** Match up the equivalent units of length:




**2.** Complete the table to identify the equivalent lengths:

| Millimetres | Centimetres |
|---|---|
| 15mm | 1.5cm |
| 20mm | 2cm |
| 752mm | 75.2cm |
| 460mm | 46cm |

**3.** Using the conversion chart below, can you convert each of the imperial measures to an approximate metric measurement?

1 inch = 2.5cm

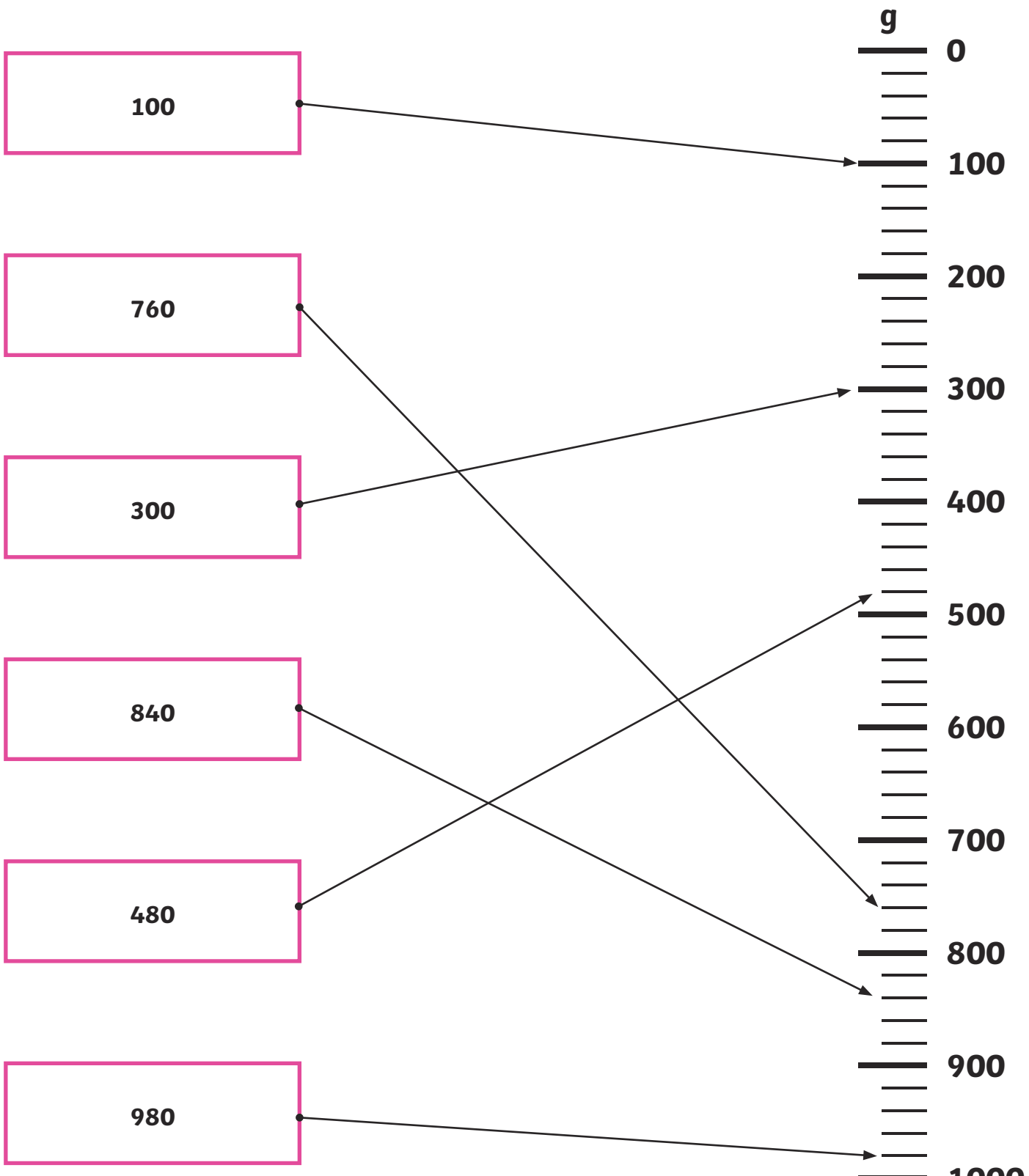
1 foot = 30cm

12 inches = 1 foot

| Millimetres | Centimetres |
|---|---|
| 2in | 5cm |
| 2f | 60cm |
| 1f 2in | 35cm |
| 3 f 4in | 1m |

# Reading the Scales - Answers

**1.** The scale shows 1 kilogram; each large division is 100 grams and each small division is 20 grams. Write in the reading for each of the arrows.



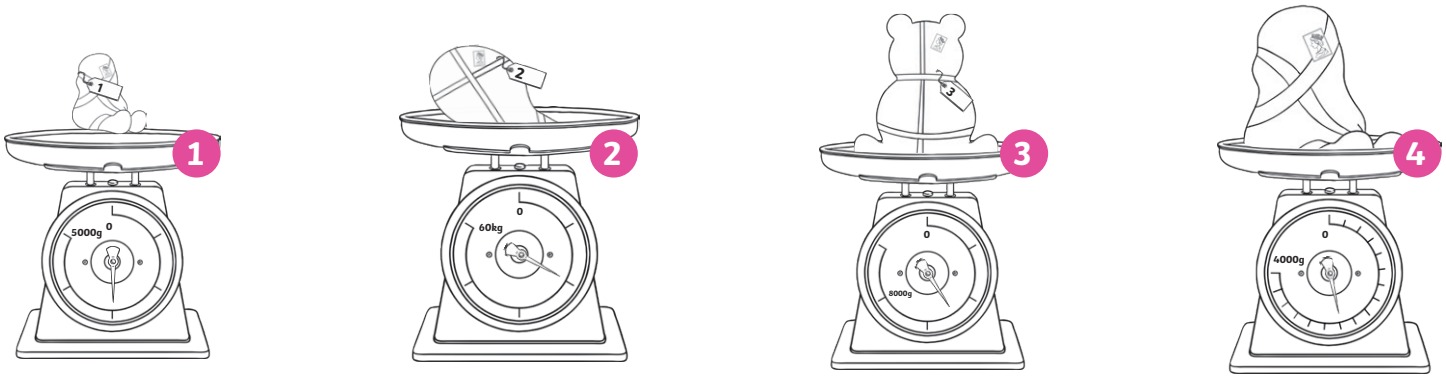
**2.** This biscuit recipe has been written in imperial measures, but the scales at home are metric. Can you convert each measurement into metric units using these approximate conversions?

1oz = 25g

16oz = 1lb

| Imperial | Metric |
|---|---|
| 3oz softened butter | 75g softened butter |
| 3oz soft brown sugar | 75g soft brown sugar |
| 5oz plain flour | 125g plain flour |
| 2oz sultanas | 50g sultanas |

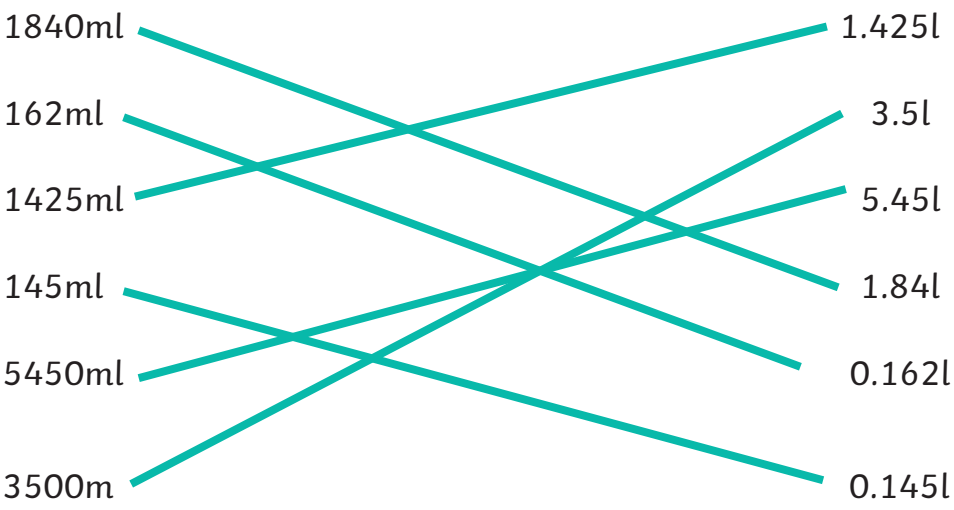
**3.** Look carefully at the scales. Write the mass shown on these scales, using both kilograms and grams:




| Parcel | Mass in grams (g) | Mass in kilograms (kg) |
|---|---|---|
| 1 | 3000 | 3 |
| 2 | 2400 | 2.4 |
| 3 | 5000 | 5 |
| 4 | 2500 | 2.5 |

# Equivalent Volume - Answers

**1.** Match up the equivalent units of volume:



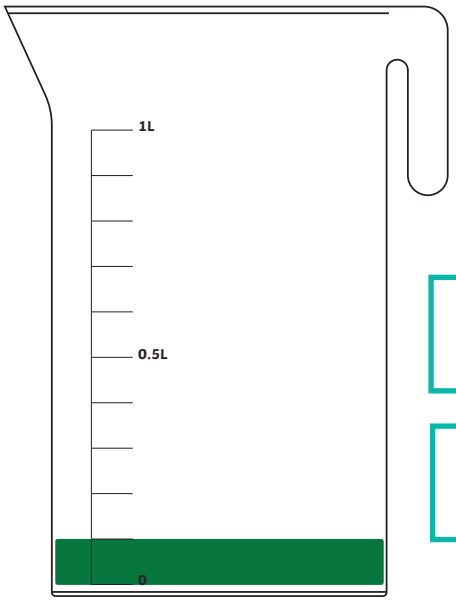

**b.** Put these measurements in order from smallest to largest:

1.2l 250ml 1.75l 1600ml 750ml

| Smallest | | | | Largest |
|---|---|---|---|---|
| **250ml** | **750ml** | **1.2l** | **1600ml** | **1.75l** |

**c.** Look carefully at the scales on each of the measuring jugs. Write the answer in both ml and l.

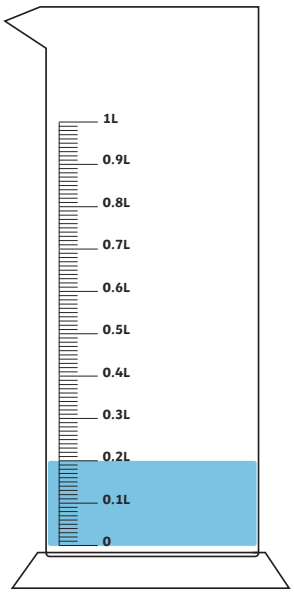
Slime of Toad




100ml

0.1l

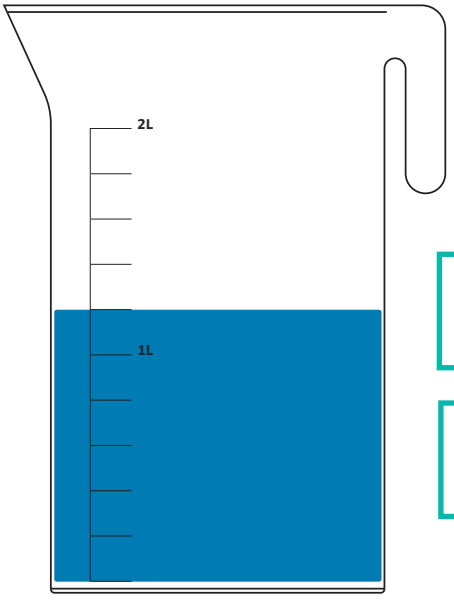
Unicorn Tears




200ml

0.2l

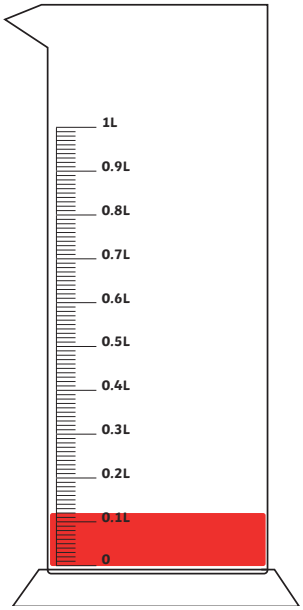
Spider Venom




1200ml

1.2l

Bat Blood




120ml

0.12l

# Time - Answers

**a.** Use your knowledge of time to answer these questions:

| | |
|---|---|
| How many minutes are there in 1 and half hours? | 90 minutes |
| How many minutes is 135 seconds? | 2 minutes<br>15 seconds |
| 240 minutes is equivalent to how many hours? | 4 hours |
| How many minutes are equivalent to three quarters of an hour? | 45 minutes |
| How many seconds are there in 3 minutes? | 180 seconds |

**b.** Joshua watches his favourite programme. It starts at 4 o'clock and finishes at quarter to 5. The adverts in the middle were 5 minutes long. How long was the television programme?

**40 minutes**

**c.** A year 6 class has 5 maths lessons during the week. Each lesson lasts 1 hour and 15 minutes. How many hours and minutes will they have maths lessons in a seven-week half term?

**5 x 1 hour and 15 minutes = 6hr 15mins lasts**

**7 x 6 hours and 15 minutes = 43hr 45mins**

# Measurement Problems - Answers

**a.** Jamie is baking scones. The recipe says that 455g of flour will make 8 scones. How much flour will they need to make 24 scones? Write your answer in kilograms.

**1.365kg**

**b.** Mohammed is training for a swimming race. He swims 1825m on Saturday and 1750m on Sunday. How many kilometres did he swim altogether?

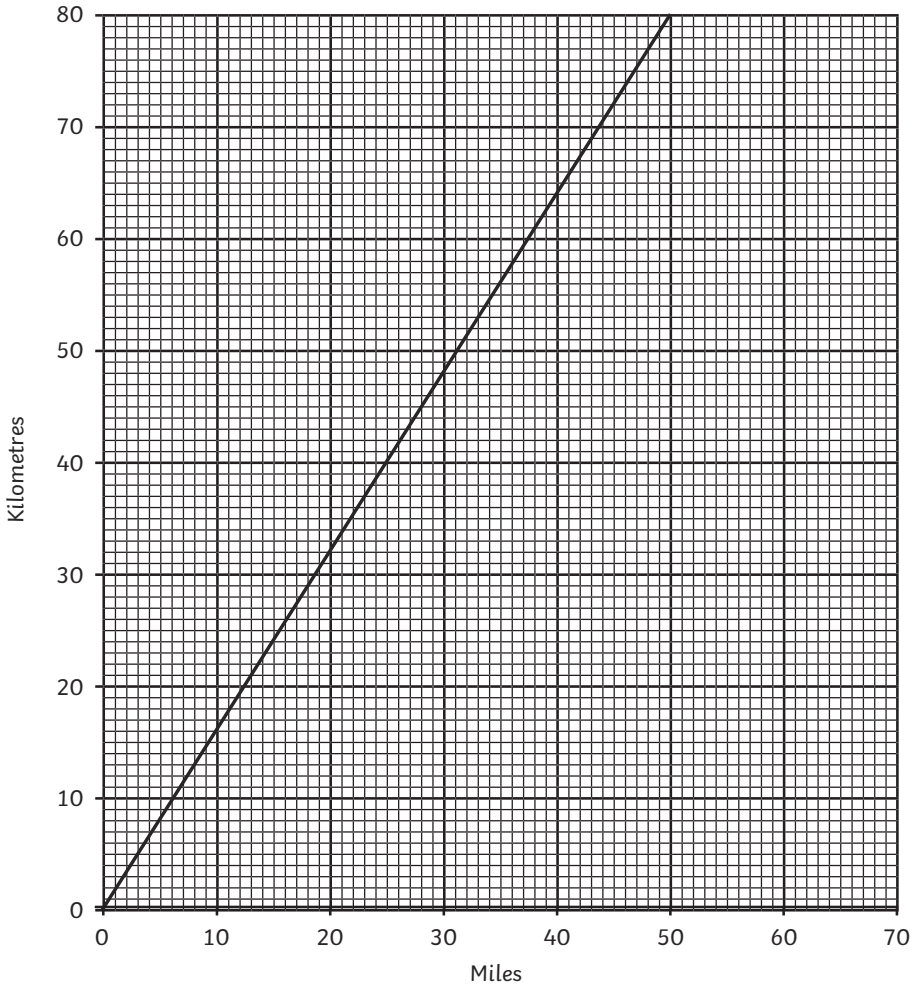
**3.575km**

**c.** Sasha's class is washing cars to raise money for charity. They use 11.5l of water to wash 2 cars. How much water is needed to wash 6 cars? Write your answer in litres.

**34.5l**

# Converting Distance - Answers

## a. Graph to Convert Miles and Kilometres




Use the conversion graph to convert these measurements.

20 miles = 32km

45 miles = 72km

15 miles = 24km

35 miles = 56km

**Answers within 1 or 2 km are accepted**

**b.** Can you round these numbers to the required degree of accuracy?

| Distance in Miles | Distance in Kilometres |
|---|---|
| 1 mile | 1.6km |
| 2 miles | 3.2km |
| 3 miles | 4.8km |
| 5 miles | 8km |
| 10 miles | 16km |
| 20 miles | 32km |

**c.** This map shows the capital cities of Great Britain and Northern Ireland.


| | |
|---|---|
| The distance between London and Cardiff is approximately 150 miles. What is the distance in kilometres to the nearest whole number? | 240km |
| The distance from Edinburgh to Belfast is approximately 190 miles. What is the distance in kilometres to the nearest whole number? | 304km |
| The distance from Cardiff to Edinburgh is approximately 400 miles. What is the distance in kilometres to the nearest whole number? | 640km |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