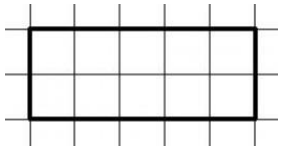
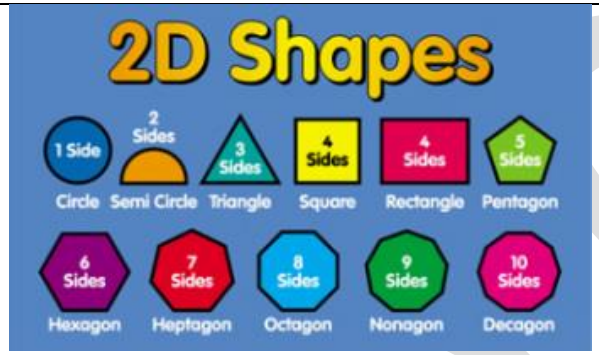
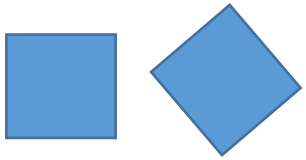
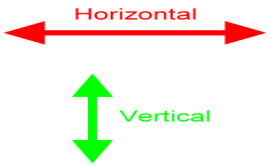
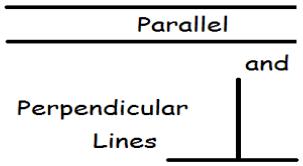
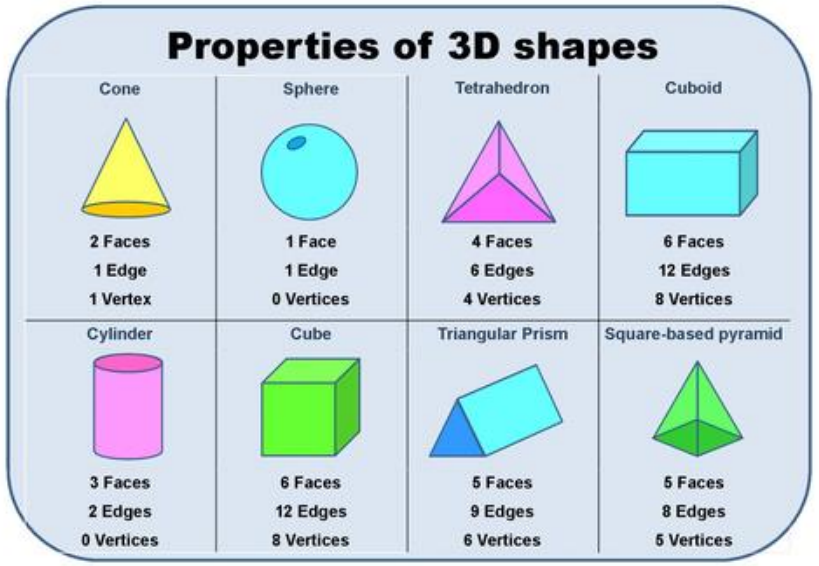
All Saints C of E Primary School

Year 3 Geometry and Measures

By the end of Year Three, children have been taught to:

Objective	Why is it important? Things to watch out for! Taught strategies
Draw 2-D shapes and Make 3-D shapes using modelling materials	In KS1, children have experienced handling and sorting 2d and 3d shapes, whereas in Year 3 children move onto constructing and drawing shapes. This is a whole new skill which requires precision, attention to detail and the use of measuring equipment, such as rulers and right angle measurers.  Drawing a rectangle is not as simple as it looks – Firstly, we have to know that it has four sides of which two are long and two are short as well as ensuring the angles are the same. Secondly, children need to be able to measure accurately using a ruler. Thirdly, children have to use equipment to ensure that the square has right angles. Initially to support the development of this, we provide squared paper to help children visualise the shape, with some lines for guidance. However, the lines have to be straight and a ruler has to be used.  At this stage, children create 3d shapes rather than drawing them because this is yet again another entirely different skill. When making 3d shapes, we provide construction equipment to explore the different shapes and their features. This mathematical play develops an understanding of nets of shapes.
Recognise 2d shapes in different orientations and describe them Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	  By this stage, children generally can recognise most of the regular 2d shapes in the illustration. When we use the term regular, regular refers to its features being all equal sides and equal angles. As well as being able to recognise them, children are taught to use the correct mathematical vocabulary to describe the shapes, such as: vertical, horizontal, parallel, perpendicular, sides, vertices and angles.   The square is still called a square even though it has been rotated. It still has four equal sides and four right angles. **Common errors** – children often think it is a different shape and forget about checking its features. This case in question results in children often saying it is a diamond. However, a diamond is not a mathematical shape it is something one wears on one's finger or on one's ears!

Identify and describe 3d shapes and their features –	By Year 3 children, will have visited and revisited 3d shapes many times from making patterns, creating towers, sorting, comparing and recognising in different contexts. The development of mathematical vocabulary is key to developing a full understanding of the features of 3d shapes. This will allow further deeper learning to take place in Year 3 and subsequent year groups. It is crucial that children need to use the correct terminology. Vocabulary: spherical, cylindrical, base, apex, conical, square based pyramid, prism, faces, vertices, edges, faces.



As well as children recognising the name of 3d shapes, they have to be able to name the features using the correct mathematical terminology.

A way of making it memorable is by saying; *we fall off edges* to help differentiate between some of the features.

As well as the 3d shapes in the illustration, we also discuss triangular based pyramids and square based pyramids.

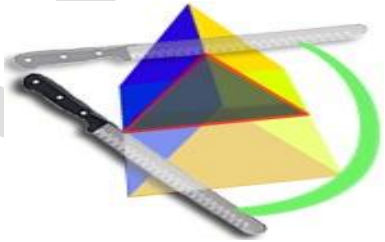
A prism is a solid object with:

identical ends, flat faces and the same **cross section** all along its length !

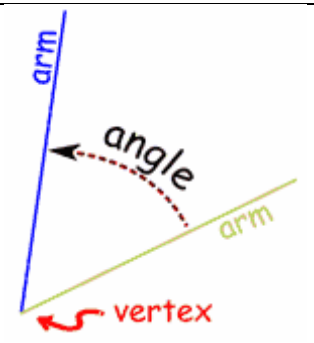
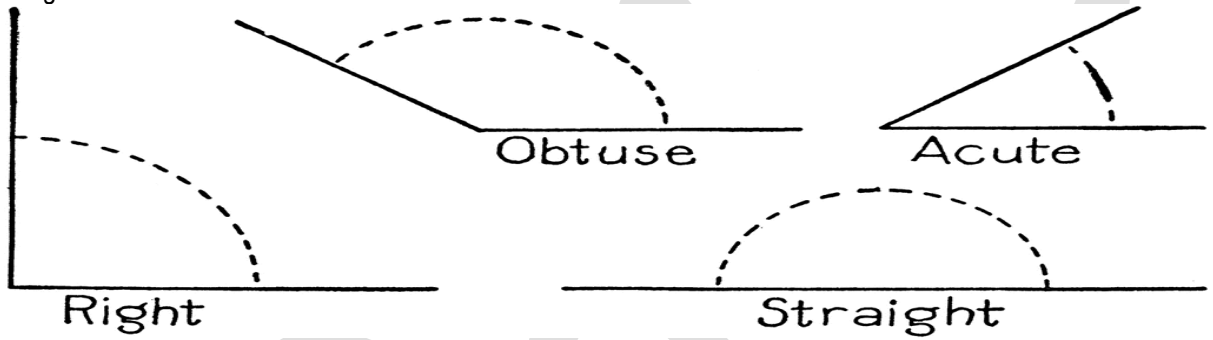
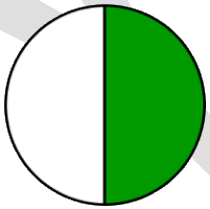
A **cross section** is the shape made by cutting straight across an object.
The cross section of this object is a **triangle** ...

.. it has the same cross section all along its length ... so it's a **triangular prism.**

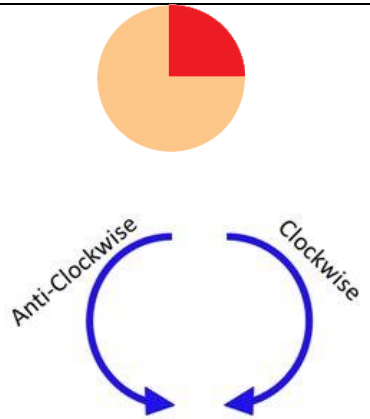
In a real life context, a tin of beans is a prism and a Battenburg cake is a type of prism.



Yes13

Recognise angles as a property of a shape or a description of a turn Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn;	 The amount of turn between two straight lines that have a common end point (the vertex). There are different types of angles such as:  *acute angle* is an angle that is less than 90° *right angle* is an angle that is 90° exactly *obtuse angle* is an angle that is greater than 90° but less than 180° *a straight line* is 180°
describe position and direction	 .  Half turn Teaching children about direction and movement within mathematics lays the foundations for telling the time, as well as rotation and symmetry in shape. Turns can be described with many different examples, such as: a whole hour – the minute hand travels around the whole clock a whole turn – turn to the right and keep going until you are facing the place that you started half turn – half way around the clock from o'clock to half past OR a turn where you are facing the opposite way.

Year 3

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Clockwise and anti-clockwise can sometimes prove a challenging thing to remember. Over the course of the years, we have tried various things, such as saying or showing:

clockwise is the normal way the clock hands go around the clock face
the letters ABC above the clock – A leads the way to the left and C leads the way to the right. B just stays where he is!

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<td>measure, add and subtract: lengths (m/cm/mm) ; mass (kg/g); volume/capacity (l/ml)</td>
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For children to be able to add and subtract with different units of measure, they have to know how it measured and the different equivalences. A lot of measures work is introduced through real life contexts and practical problem solving to ensure children have a rich experience which will develop their understanding of measure.



A litre is just a lot of millilitres put all together. In fact, 1000 millilitres makes up 1 litre.

1 litre = 1,000 millilitres

Litres are often written as L (for short), so "3 L" means "3 Litres".

Milk, juice and other drinks are often sold in litres.

Try looking at labels, so the next time you are at the shop or cupboard and take a minute and check out how many litres (or millilitres) are in each container!



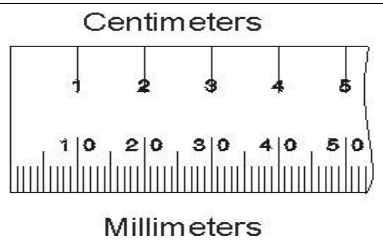
Once you have 1,000 grams, you have 1 kilogram.

1 kilogram = 1,000 grams

A dictionary has a mass of about one kilogram.

Kilograms are great for measuring things that can be lifted by people (sometimes very strong people are needed of course!). Kilograms are often written as kg (that is a "k" for "kilo" and a "g" for "gram"), so "10 kg" means "10 kilograms".
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Year 3



A **metre** is equal to 100 centimetres.

1 metre = 100 centimetres

Metres might be used to measure the length of a house, or the size of a playground.

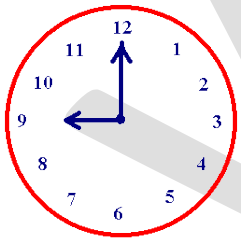
Some examples of measures problem solving:

Megan is 109cm tall. Sunil is 137cm tall. How much taller is Sunil than Megan?	 This jug has 500ml of water in it. Ravi pours 150 millilitres of water out of this jug. How much water will be left in the jug?	Sita has 3m 60cm of ribbon. She cuts it into three equal pieces. How long is each piece?

Tell and write the time from an analogue clock, including using Roman Numerals from I to XII, and 12-hour and 24-hour clocks.

Progression in telling the time – analogue to digital

o'clock



Half past

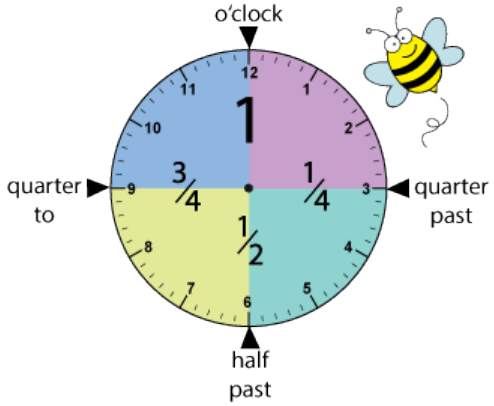
o'clock and half past

Telling the time can be a challenging thing to learn. This is why we focus on teaching times, such as o'clock and half past before discussing any other times. Creating a meal time visual planner for breakfast, lunch and dinner at these key times helps children talk about important times, as well as the ability to tell the time.

'If the large minute hand is pointing to the 12, it means it is telling us that it is o'clock. If the small hour hand is pointing to the 5 and the large hand is pointing to the 12 it is telling us that is 5 o'clock.' Patience is the key with telling the time!

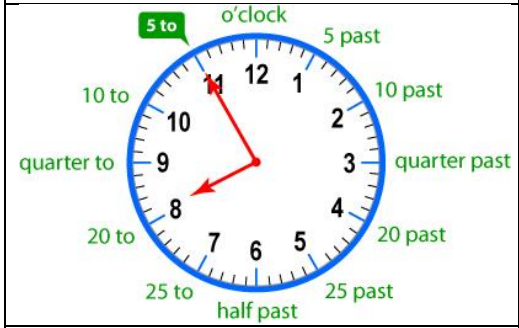
Common errors:

Children get mixed up between the hour hand and the minute hand.



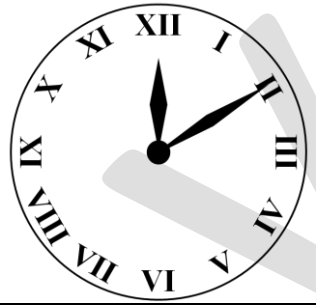
o'clock, half past, quarter past and quarter to

Half past, quarter to and quarter past can be taught alongside fractions when thinking about half a circle and quarters of circles. We also focus on teaching children that there are 15 minutes in quarter of an hour and 30 minutes in half an hour. We encourage children to count the small divisions on a clock face to find out how many minutes there are in quarter of an hour and in half
an hour.



Minutes to and minutes past

When we look at minutes past the hour, we discuss how when every time the minute hand passes one of the numbers another five minutes have passed. Once children have learned this concept they, with practice, can quickly work out the time. Labelling the household clock can give valuable practice to a child.
Quarter to often proves to be a lot more challenging because instead of counting clockwise minutes past the hour we count anti-clockwise around the clock from twelve. Many children often say forty minutes past three rather than twenty minutes to four.



Introducing roman numerals can provide some great problem solving activities such as challenging children to work out the values of each of the numbers. This coincides with Year 3's history work on Romans.

digital

Many children are exposed to digital times in their everyday lives such as on mobile phones,
tablets and digital alarm clocks. Children often prefer telling the time using digital clocks. However, they have to be able to tell the time using an analogue clock.

Year 3



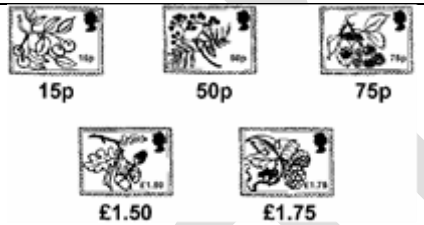
add and subtract amounts of money to give change, using both £ and p in practical contexts

When adding and subtracting money, we apply the addition calculation strategies taught for the year group. We do encourage children to think about relative values to avoid unnecessary formal calculations. For example, when something costs £9.99 and it is paid for with a £10.00 note we would expect children to think logically about the values and recognise that there is only one pence difference between the values. Due to the nature of some of the notes and the stage that children are at in their subtraction calculations, we may encourage children to count on/back on a number line rather than asking them to do a formal calculation with zeros in the top column which can cause difficulties before they have reached that stage in the calculating progression.

Examples of money problems:

Sita had £10. She spent £2.35.
How much money did she have left?





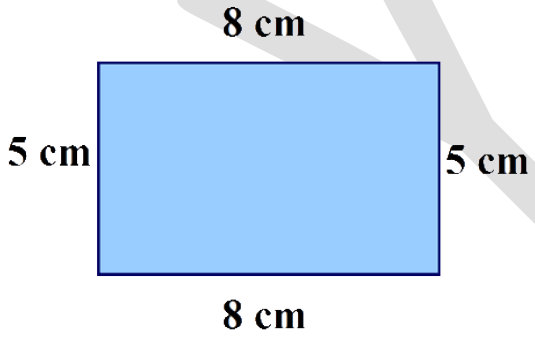
David posts a parcel. It costs £1.90. He uses two of these stamps.
Which two stamps does he use?



Lewis makes a call from a telephone box. He has £2 in coins.
He uses these five coins to make the call.

How much money has he got left from the £2?

measure the perimeter of simple 2-D shapes



The perimeter of a shape is the distance around it. For example, the perimeter of the rectangle is:

8+5+8+5= 26cm

Year 3

Year 3