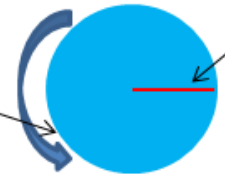
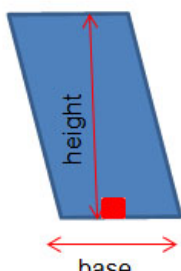

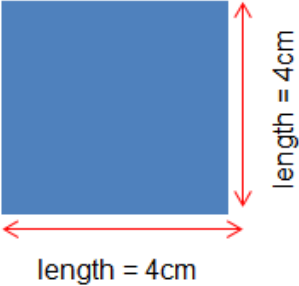


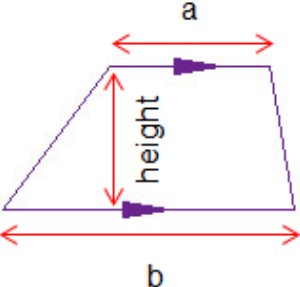
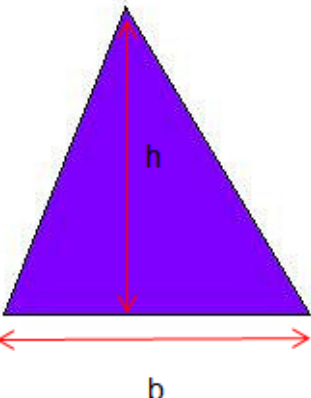
Measurement

Terms	Illustrations	Definitions
<p>Area</p>		<p>The amount of surface space an object covers, measured using non-standard and standard units.</p> <p>Area is usually measured in square units e.g. square centimetres (cm²), square metres (m²) etc.</p>
<p>Area of a circle</p>	<div style="text-align: center;"> $A = \pi r^2$  </div> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div style="border: 1px solid black; padding: 5px; width: 30%;"> <p>The circumference is the distance around the outside edge of circle.</p> </div> <div style="border: 1px solid black; padding: 5px; width: 30%;"> <p>The radius of a circle is the distance from the centre to the circumference.</p> </div> </div>	<p>Area = $\pi \times r^2$</p> <p>r = radius, d = diameter</p>
<p>Area of a parallelogram</p>	<div style="text-align: center;"> <p>Area = base x height</p>  </div>	<p>Area = $b \times h$</p> <p>b = base</p> <p>h = vertical height</p>


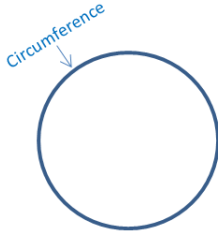
Measurement

Area of a rectangle	<p>Area = length x breadth</p> <p>Area = 8cm x 4cm = 32cm²</p>  <p>A blue rectangle is shown. A red double-headed arrow below it is labeled 'length = 8cm'. A red double-headed arrow to its right is labeled 'breadth = 4cm'.</p>	<p>Can be found by counting the squares or half squares in the rectangle or by using the following formula;</p> <p>Area = $l \times b$</p> <p>l=length, b = breadth</p>
Area of a square	<p>Area = length x length</p> <p>Area = 4cm x 4cm = 16cm²</p>  <p>A blue square is shown. A red double-headed arrow below it is labeled 'length = 4cm'. A red double-headed arrow to its right is labeled 'length = 4cm'.</p>	<p>Can be found by counting the squares or half squares in the square or by using the following formula;</p> <p>Area = l^2 l = length of side</p>


Measurement

Area of a trapezium	 <p>The diagram shows a purple trapezium with a shorter top side labeled 'a' and a longer bottom side labeled 'b'. A vertical red double-headed arrow between the two sides is labeled 'height'.</p>	Area = $\frac{1}{2}(a + b) \times h$ $h =$ vertical height
Area of a triangle	<p>Area = $\frac{1}{2} \times b \times h$</p>  <p>The diagram shows a purple triangle with a horizontal base labeled 'b' and a vertical red double-headed arrow from the top vertex to the base labeled 'h'.</p>	Area = $\frac{1}{2} \times b \times h$ $b =$ base $h =$ vertical height

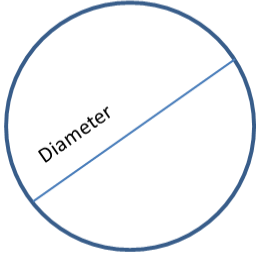
Measurement

Breadth		It is the same as width.
Capacity	 <p>The capacity of the container is 2 litres or <u>2000ml</u>.</p> <p>The volume of the container is <u>2000cm³</u>.</p>	The maximum amount of space an object/container can hold e.g. <i>its maximum capacity is 2 litres</i> . Capacity is measured in ml. There are 1000ml in a litre.
Circumference	 <p>Circumference</p>	The distance all the way around a circle . Circumference can be measured using the formula; $2 \times \pi \times r$ or $\pi \times d$



Measurement

<p>Conservation of volume</p>	 A photograph showing three different containers filled with a red liquid. From left to right: a tall, narrow measuring cylinder with a scale; a large measuring jug with a scale and a pouring spout; and a wide, short glass. The liquid level in each container is at the 150ml mark, demonstrating that the volume of liquid is conserved despite the different shapes of the containers.	<p>Recognise that shapes and objects that look different can have equal volume <i>e.g. by using different measuring jugs to show the same volume.</i></p> <p>In this example shown, there is 150ml of juice in each container.</p> <p>The conservation of volume is knowing that when any object is split into smaller parts then the total volume of the parts is equal to the original volume..</p>
<p>Degree of accuracy</p>		<p>The level of accuracy to round a number to e.g.</p> <ul style="list-style-type: none">to the nearest 10, 100, 1000.to 1 decimal placeto 3 significant figures. <p>This is particularly important in measurement in order to ensure accurate measurements. See tolerance in measurement.</p>

Measurement

Diameter		A straight line which passes through the centre of a circle.
Height		How tall something is from its base to its top. The vertical distance between the top to bottom of an object.
Length		How long something is from end to end. The distance from one point to another.
Length conversions		10mm in 1cm 100cm in 1 metre 1000m in a kilometre Converting between lengths may look like; 4.7m = 4m 70cm or 470cm $\frac{1}{2}$ m = 50cm

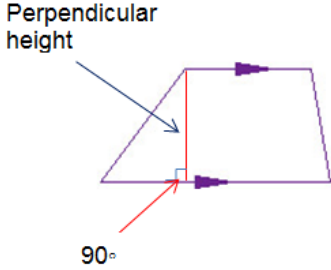
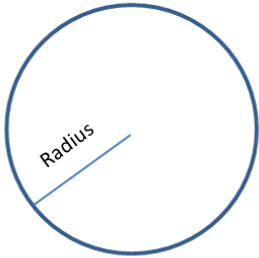
Measurement

Mass		<p>A large body of matter with no definite shape.</p> <p>The amount of matter in an object.</p>
Measuring tape / Tape measure	 A photograph showing two yellow measuring tapes and one pink measuring tape. The yellow tapes are extended and crossed in an X-shape, while the pink one is coiled.	<p>Similar to a metre stick but it is flexible. It is often used to measure around things e.g. body parts when measuring for clothes. It can go beyond 1 metre in length. Most measuring tapes have dual measures showing metric and imperial measurements e.g. <i>one side is marked in cm and m and the other sides in inches.</i></p>
Metre Stick	 A photograph of three metre sticks lying on a wooden surface. The top one is a wooden ruler with markings every 10 units. Below it are two metal rulers, one with markings every 10 units and the other with markings every 1 unit.	<p>A straight measuring device that is 1 metre in length, usually marked in centimetres but some can be marked in millimetres too.</p>

Measurement

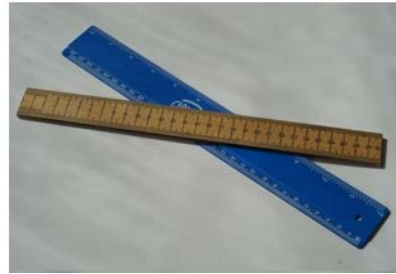
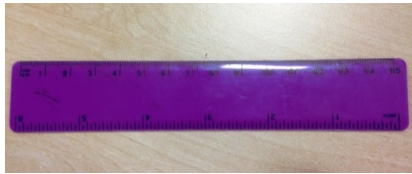
Metric system		The decimal measuring system based on the metre, litre, and gram as units of length, capacity, and weight or mass.
Non-standard units of measurement		<p>Everyday objects which can be used to compare measurements e.g. hands, feet, leaves etc.</p> <p>Any item used to measure items e.g. the tub can hold 13 rubbers (early capacity) or the table is 7 hands long (early length).</p> <p>Children will experiment with these until learning about the need for a set unit of measurement which is more accurate (standard units of measurement).</p>
Pedometer	 A photograph showing a person's waist. They are wearing a bright pink t-shirt and grey jeans. A black pedometer is clipped to their belt. A green strap is also visible on the belt.	A measuring device to calculate the distance travelled by the user by measuring the number of steps taken. Can be attached to clothing or some pedometers are now available for the wrist, ankle or smartphone apps.

Measurement

Perimeter of a shape		The distance all the way around the outside of a 2D shape. To find the perimeter of a shape, add together the lengths of all the sides. The total is the perimeter.
Perpendicular height	 <p>Perpendicular height</p> <p>90°</p>	The height measured from the base to the vertex at the top, creating an angle of 90 degrees with the base.
Radius	 <p>Radius</p>	The distance from the centre of a circle to any point on its circumference.

Measurement

Ruler





A straight measuring device, often 30 centimetres in length. It can also be used to draw straight lines.

Scales

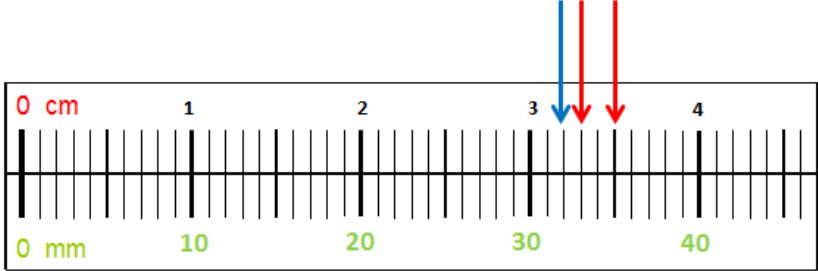



A measuring device used to measure an object's weight or mass. This can be in the form of digital scales, kitchen scales (analogue) and two pan balance scales


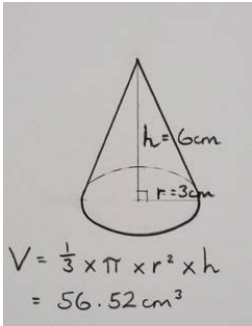
Measurement

Speedometer		Measuring device to measure the speed travelled by a vehicle. Usually found on the vehicle's dashboard. Speedometers can be analogue or digital.
Standard units of measurement		The universal system of measurement <i>e.g. mm, cm, ml, litres g, kg etc</i>
Surface area		The total area of the surface of a three-dimensional object. <i>E.g. the surface area of a cube is the area of all 6 faces added together.</i>
Thermometer		A measuring device used to measure temperature. The thermometer reading will rise when the temperature rises and fall when the temperature falls. Temperatures are recorded using the standard units of Degrees Celsius ($^{\circ}\text{C}$) or Fahrenheit ($^{\circ}\text{F}$).

Measurement

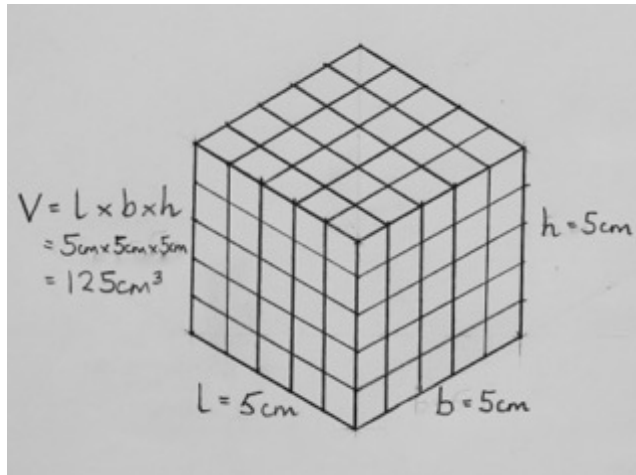
<p>Tolerance in measurement</p>	<p>If the task was to mark <u>3.4cm</u> on this ruler and the tolerance accepted in the measurement was plus or minus <u>0.1cm (1mm)</u> – both red arrows would be correct as they measure <u>3.3cm</u> and <u>3.5cm</u>. They are within <u>0.1cm (1mm)</u> of the actual required measurement.</p> <p>The blue arrow would not be accepted as it measures <u>3.2cm</u>, which is more than <u>0.1cm (1mm)</u> out with the actual required measurement. It is <u>0.2cm (or 2mm)</u> out.</p>  <p>The image shows a ruler with centimeter markings from 0 to 4 and millimeter markings from 0 to 40. A blue arrow points to the 3.2 cm mark, and two red arrows point to the 3.3 cm and 3.5 cm marks.</p>	<p>The margins of error acceptable in different contexts and the impact this could have on the result.</p> <p>The 'degree of tolerance' will vary from context to context.</p>
<p>Trundle Wheel</p>	 <p>The image shows a yellow trundle wheel with a black handle.</p>	<p>A measuring device shaped as a wheel with a holding stick. Measures larger distances when a metre stick may be impractical <i>e.g. measuring a football field or car park length</i>. One full rotation of the trundle wheel is 1 metre and it clicks to alert the user when rotation has been completed so users need to keep count of the clicks.</p>

Measurement

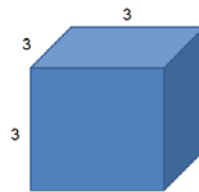
<p>Volume</p>	 <p>The capacity of the container is 2 litres or 2000ml.</p> <p>The volume of the container is 2000cm³.</p>	<p>The measure of space taken up by a 3D object. Usually measured in cubic units; for example, cubic centimetres (cm³) and cubic metres (m³).</p>
<p>Volume conversions</p>		<p>1000ml in a litre</p> <p>Conversions between volumes may include e.g. 5.8l = 5 litres 800ml or 5800ml, ½ litre = 500ml</p>
<p>Volume of a cone</p>	 <p>$V = \frac{1}{3} \times \pi \times r^2 \times h$ $= 56.52 \text{ cm}^3$</p>	$V = \frac{1}{3} \times \pi \times r^2 \times h$ <p>V = volume $\pi = 3.14...$ (pi) r = radius h = height</p>

Measurement

Volume of a cube
or cuboid



Cubed



3 cubed or $3^3 = 3 \times 3 \times 3 = 27$

$$V = L^3 \text{ or } V = L \times b \times h$$

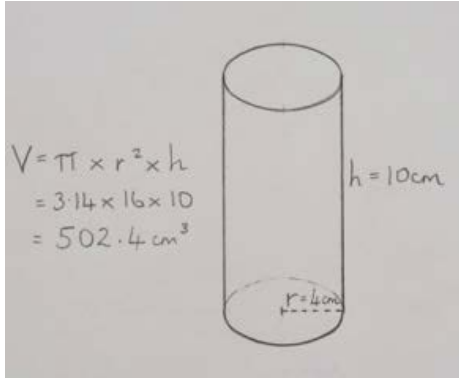
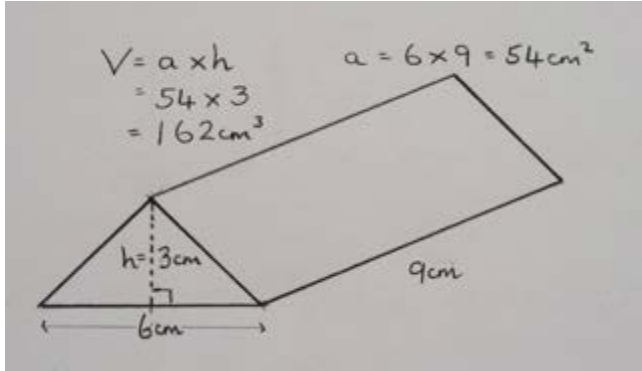
V = volume

L = length

b = breadth

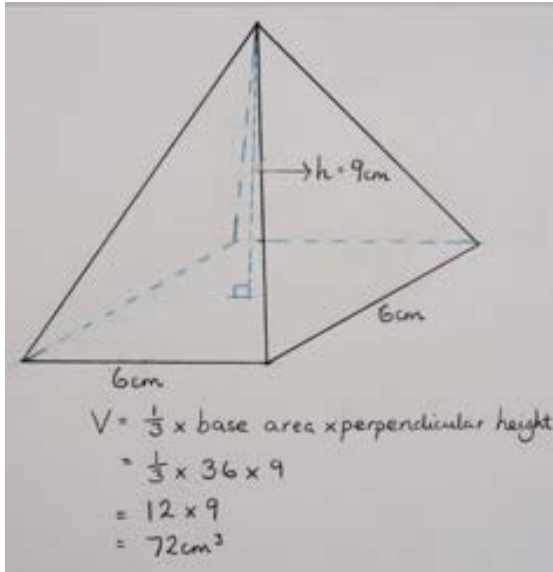
h = height

Measurement

Volume of a cylinder	 <p>$V = \pi \times r^2 \times h$ $= 3.14 \times 16 \times 10$ $= 502.4 \text{ cm}^3$</p> <p>$r = 4 \text{ cm}$ $h = 10 \text{ cm}$</p>	$V = \pi \times r^2 \times h$ V = volume $\pi = 3.14\dots$ (pi) r = radius h = height
Volume of a prism	 <p>$V = a \times h$ $= 54 \times 3$ $= 162 \text{ cm}^3$</p> <p>$a = 6 \times 9 = 54 \text{ cm}^2$</p> <p>$h = 3 \text{ cm}$ 6 cm 9 cm</p>	$V = a \times h$ a = area of base h = height

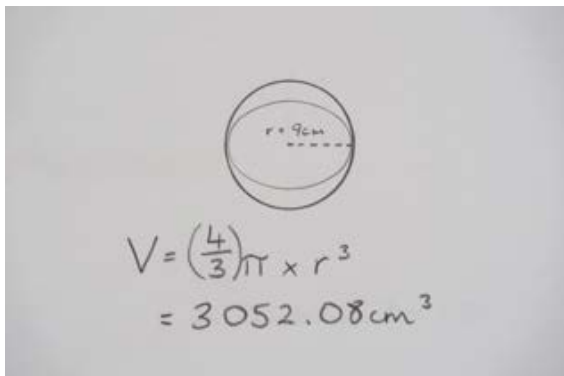
Measurement

Volume of a pyramid



$$V = \frac{1}{3} \times \text{base area} \times \text{perpendicular height}$$

Volume of a sphere



$$V = \left(\frac{4}{3}\right) \pi \times r^3$$

V = volume
 $\pi = 3.14\dots$ (pi)
r = radius

Measurement

Weight		How heavy something is. A person or object's mass.
Weight conversions		1000g in a kg Conversions between weights may include e.g. 4673g = 4 kg 673g or 4.673kg , $\frac{3}{4}$ of kg = 750g
Width		How wide something is from side to side.