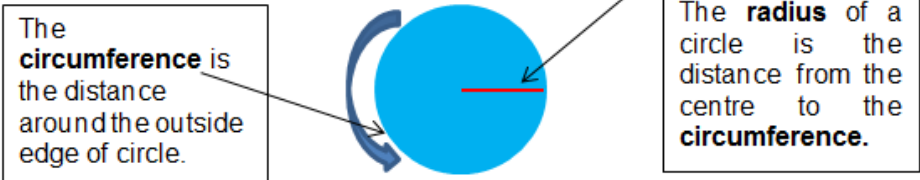
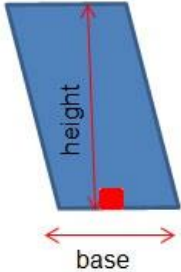

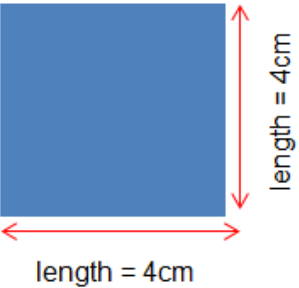


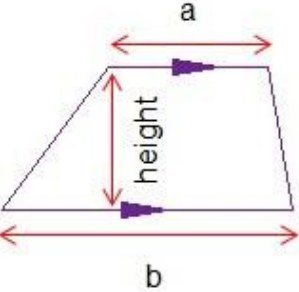
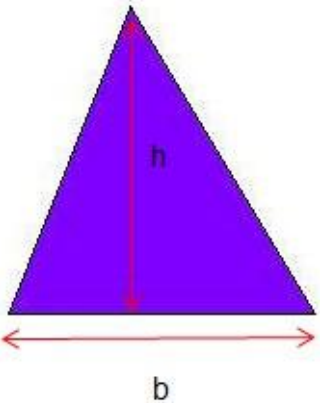
Measurement

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 (cm^2), square metres (m^2) etc.</p>
<p>Area of a circle</p>	<div style="text-align: center;"> $A = \pi r^2$  <p>The circumference is the distance around the outside edge of circle.</p> <p>The radius of a circle is the distance from the centre to the circumference.</p> </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;"> $\text{Area} = \text{base} \times \text{height}$  </div>	<p>Area = $b \times h$</p> <p>b = base</p> <p>h = vertical height</p>


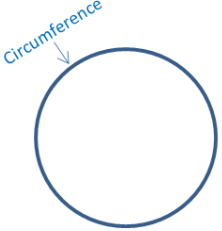
Measurement

Area of a rectangle	<p>Area = length x breadth</p> <p>Area = <u>8cm</u> x <u>4cm</u> = <u>32cm²</u></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</p> <p>b = breadth</p>
Area of a square	<p>Area = length x length</p> <p>Area = <u>4cm</u> x <u>4cm</u> = <u>16cm²</u></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

<p>Area of a trapezium</p>	 <p>The diagram shows a trapezium with a shorter top horizontal side labeled 'a' and a longer bottom horizontal side labeled 'b'. A vertical line segment inside the trapezium, representing the height, is labeled 'height' and has arrows at both ends pointing to the top and bottom sides.</p>	<p>Area = $\frac{1}{2}(a + b) \times h$</p> <p>$h$ = vertical height</p>
<p>Area of a triangle</p>	<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 line segment from the top vertex to the base labeled 'h', representing the height.</p>	<p>Area = $\frac{1}{2} \times b \times h$</p> <p>b = base</p> <p>h = vertical height</p>


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		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 glass; a clear plastic measuring jug with a scale on its side; and a shorter, wider beer glass. The liquid level in each container is the same, illustrating that the volume of liquid is conserved regardless of the container's shape.	<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 <i>e.g.</i></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

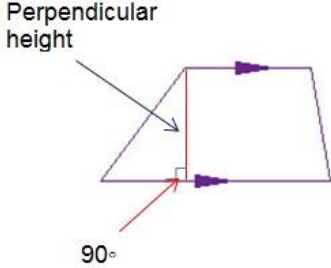
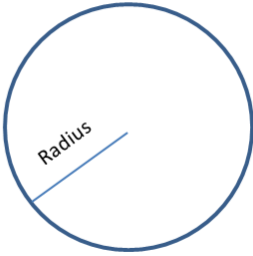
Measurement

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 with black casings and a pink fabric measuring tape. The yellow tapes are crossed in an X-shape, and the pink one is coiled in the center.	<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 showing three rulers on a wooden surface. The top one is a wooden ruler marked in centimeters. Below it are two metal rulers, one marked in centimeters and the other in millimeters.	<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 midsection. They are wearing a bright pink t-shirt and grey denim jeans. A black pedometer is clipped to their belt. A green strap is also visible on the belt. The background shows a grassy field and trees under a blue sky.	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		The height measured from the base to the vertex at the top, creating an angle of 90 degrees with the base.
Radius		The distance from the centre of a circle to any point on its circumference.

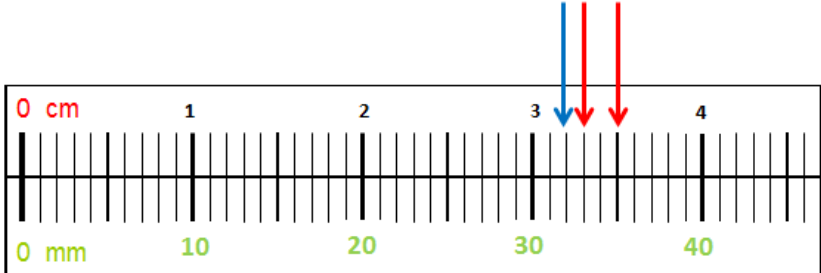

Measurement

Ruler	 <p>The image shows three rulers. On the left is a purple plastic ruler with centimeter markings. On the right are two blue rulers: one is a wooden ruler with centimeter markings, and the other is a blue plastic ruler with centimeter markings. They are arranged in a crisscross pattern.</p>	<p>A straight measuring device, often 30 centimetres in length. It can also be used to draw straight lines.</p>
Scales	 <p>The image displays four different types of scales. Top left: A black two-pan balance scale with a brass weighing pan and several black weights. Top right: A white digital kitchen scale with a circular display. Bottom left: A white kitchen scale with a clear plastic weighing bowl and a circular dial. Bottom right: A black digital hanging scale with a metal hook and a black strap.</p>	<p>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</p>


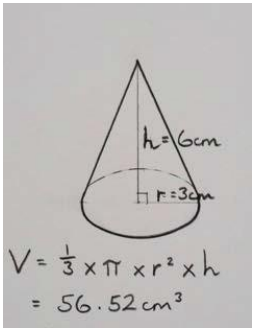
Measurement

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

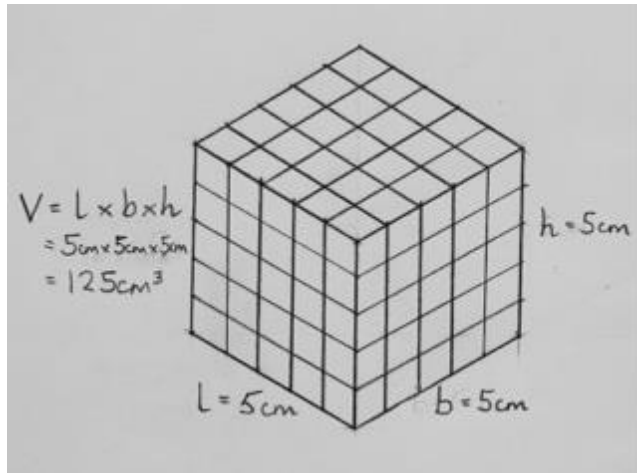
<p>Tolerance in measurement</p>	<p>If the task was to mark <u>3.4cm</u> on this ruler and the tolerance accepted in the measurement was plus or minus <u>0.1cm (1mm)</u> – both red arrows would be correct as they measure <u>3.3cm</u> and <u>3.5cm</u>. They are within <u>0.1cm (1mm)</u> of the actual required 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 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>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>	<div style="border: 1px solid black; padding: 10px;"> <p>$V = \frac{1}{3} \times \pi \times r^2 \times h$</p> <p>V = volume</p> <p>r = radius</p> <p>h = height</p> <p>$\pi = 3.14\dots$ (pi)</p> </div>

Measurement

Volume of a cube
or cuboid



$$V = L^3$$

Or

$$V = L \times b \times h$$

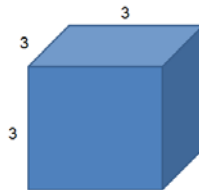
V = volume

L = length

b = breadth

h = height

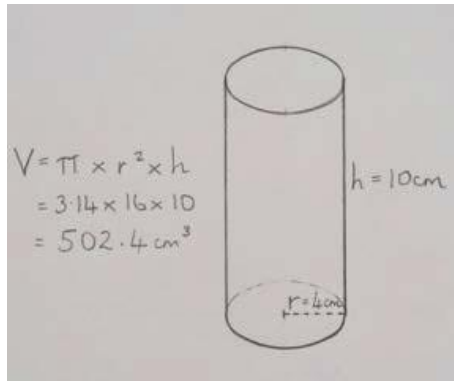
Cubed



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

Measurement

Volume of a cylinder



$$V = \pi \times r^2 \times h$$

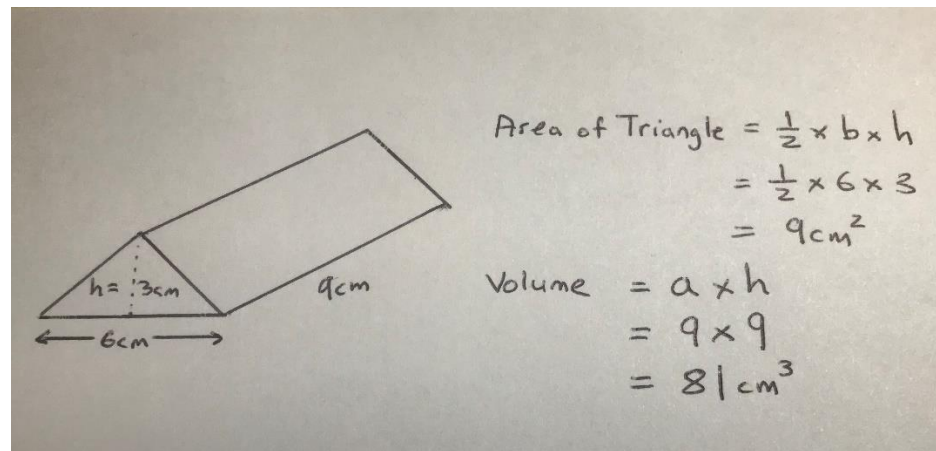
V = volume

r = radius

h = height

$\pi = 3.14...$ (pi)

Volume of a prism



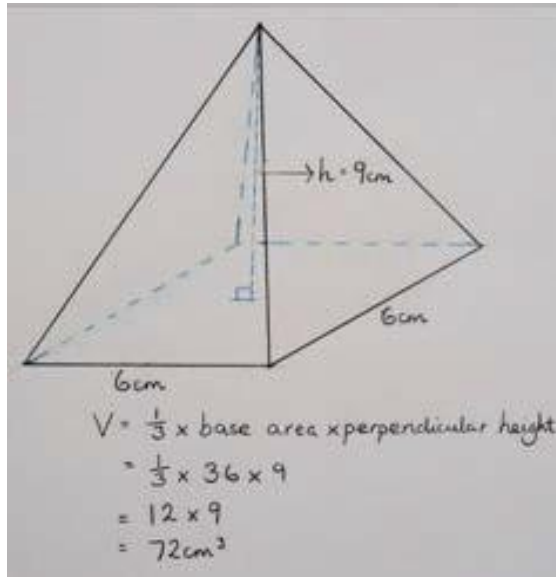
$$V = a \times h$$

a = area of base

h = height

Measurement

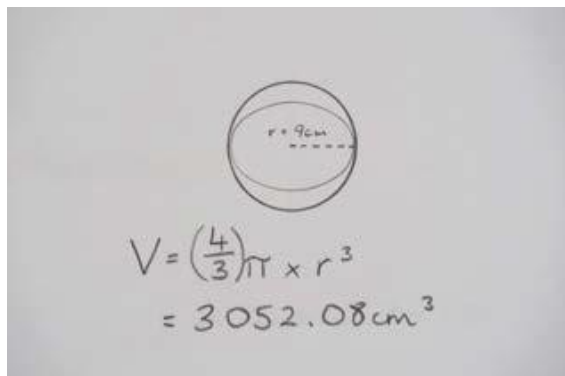
Volume of a pyramid



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

$V = \text{volume}$

Volume of a sphere



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

$V = \text{volume}$

$r = \text{radius}$

$\pi = 3.14\dots (\text{pi})$

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.