

KS4 Maths
Geometry- Shape

<p>Subject curriculum intent:</p>	<p>We want our pupils to be able to develop functional shape skills so that they can be as independent as possible in their adulthood whereby they use and applying shape knowledge to understand perimeter and area.</p> <p>We want our pupils to...</p> <ol style="list-style-type: none"> 1. develop fluency in the fundamentals of mathematics so that they are efficient in using and selecting the appropriate strategies to use shape skills including mental methods, underpinned by mathematical concepts 2. can solve problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios 3. can reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language. <p>In all math lessons, teachers plan engaging lessons with the aim that pupils:</p> <ul style="list-style-type: none"> • master skills in maths which they are then able to apply to a range of contexts within the school and home context • embed their new skills and understanding to a range of contexts; thus supporting application and progress in learning • acquire core mathematical skills to support their independence as they progress through the school • are able to apply their understanding; supporting them in other areas of the curriculum 		
<p>End of KS3 intent/outcome</p>	<p>End of KS4 intent/outcome</p>	<p>End of KS5 intent/outcome</p>	
<p>Students will be confident in identifying 2D and 3D shapes. Students will begin to recognise the properties of 2D and 3D shapes as well as being able to sort shapes based on colours and properties.</p> <p>Students will begin to use and apply their measuring skills to measure the sides and/or perimeter of 2D shapes using non-standard or standard units. They will begin to make connections to properties of shapes to do this.</p>	<p>Students will continue to build on their learning from key stage 3. Students will be able to name 2D and 3D shapes by sight and develop confidence in identifying their properties.</p> <p>Students will confidently use and apply their measuring skills to measure the perimeter of shapes.</p> <p>Where appropriate, students will begin to use and apply their measure and multiplication skills to calculate areas of 3D shapes.</p>	<p>Students will continue to develop their geometry and measurement skills, building on from KS4. Students will become more confident in using nets to recognise 3D shapes and their properties. Students will use and apply their perimeter and area knowledge and skills to use functionally as a young adult. For example, planning which furniture to have for a room in the home.</p>	
<p>Intent for this topic:</p>	<p>This half term, pupils will continue to build on the knowledge gained from Key stage 3. Starting from their last learning point, students will be able to develop their understanding of 2D and 3D shapes. Students will be able to use verbal and written skills to describe the properties of shapes. Students will create and complete patterns using shapes and will be able to describe different patterns. Students</p>		

will continue to develop independence skills recognising shapes in everyday items and areas that they use (e.g. what shapes can you see in the food tech room?)

Key vocabulary taught within this topic:	Square, circle, triangle, rectangle, oval, pentagon, octagon, cube, sphere, cone, cylinder, cuboid, 2D, 3D, sides, corners, edges, faces, properties, sorting.
Links to other subjects:	<ul style="list-style-type: none"> - PE- Gymnastics- shapes - PSHCE- Similarities and differences

Suggested flow:

This flow is to be used as a guide. Teachers to adapt the flow to meet the needs and abilities of students within their class.

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Pre-assessment. What knowledge and skills do pupils already have? Identifying 2D/3D shapes.	Symmetry in shapes	Properties of 2D/3D shapes. Including angles	Shape sequences/Position and direction of shapes. Understanding lines of symmetry.	Length- Measuring length of shapes in cm.	Calculating perimeters of shapes. Finding missing measurements.
			Link to statistics. Early algebra skills.	Early algebra skills.	Early algebra skills.

Shape knowledge and skills:

	B2 P5	B2 P6-8	B2 step 1c-1b	B2 Step 1b-2c	B2 Step 2c-2a	B2 Step 2a-3a
<u>Subject specific knowledge</u>	<u>To know</u> to pick up and look at a range of shapes available	<u>To know</u> that the shape is the same even when it is a different colour/size from the original	<u>To know</u> size, colour and position do not alter the name of the shape	<u>To know</u> and name 3D shapes: sphere, cuboid, cube and pyramid.	<u>To know</u> properties of all 2D shapes	<u>To know</u> to use a ruler to draw shapes
<u>What do pupils need to know?</u>	<u>To know</u> to feel the whole shape		<u>To know</u> the word 'dimensional'		<u>To know</u> where lines of symmetry are for 2D shapes	<u>To know</u> what a right angle is

	<p><u>To know shapes go onto the peg board</u></p>	<p><u>To know the shape is the same even when it is turned</u></p> <p><u>To know a triangle by their three representations (do not need to know mathematical names - just that they are all triangles)</u></p> <p><u>To know the name of 2D shapes: circle, square, rectangle, triangle and oval</u></p>	<p><u>To know what a shape or 2D or 3D</u></p> <p><u>To know 3D shapes: sphere, cuboid, cube and pyramid.</u></p>	<p><u>To know which shapes are 3D without visuals</u></p>	<p><u>To know properties of all 3D shapes</u></p>	<p><u>To know angles: acute and obtuse</u></p>
<p><u>Subject specific skills</u></p> <p>What do pupils need to be able to do?</p>	<p><u>Is able to experience and handle different shapes</u></p> <p><u>Is able to place a shape inside a suitable space (e.g. Numicon on a pegboard)</u></p> <p><u>Is able to make marks using a shape on a page (printing)</u></p>	<p><u>Is able to find physical shapes that are the same.</u></p> <p><u>Is able to experience drawing around a shape</u></p> <p><u>Is able to name 2D shapes: Rectangles, squares, circles, triangles and ovals (P8)</u></p> <p><u>Is able to count number of sides on simple shapes</u></p>	<p><u>Is able to find 2d shapes in their environment</u></p> <p><u>Is able to separate 2d and 3d shapes</u></p> <p><u>Is beginning to recognise and name 3D shapes: sphere, cuboid, cube and pyramid.</u></p>	<p><u>To be able to relate images to 3D shapes</u></p> <p><u>Is able to name 3D shapes from a picture or symbol alone</u></p> <p><u>Is able to compare and sort common 2d and 3d shapes and every day objects</u></p>	<p><u>Is able to identify and find properties of 2d shapes; including sides and line of symmetry</u></p> <p><u>Is able to identify and describe 3d shapes; including edges, vertices and faces</u></p> <p><u>Is able to identify 2d shapes on the faces of 3d shapes</u></p>	<p><u>Is able to draw 2d shapes accurately</u></p> <p><u>Is able to create 3d shapes using pliable material</u></p> <p><u>Is able to describe 3d shapes</u></p> <p><u>Is able to identify right angles in shapes</u></p> <p><u>Is able to be able to identify horizontal and vertical lines and pairs of perpendicular and parallel lines</u></p>

<u>Suggested teaching activities</u>	<ul style="list-style-type: none"> Using concrete 2D and 3D shapes. Active learning opportunities or Kahoot for consolidation. Using standard or non-standard units to measure sides of 2D shapes Using knowledge of shape properties to identify missing lengths of sides Use and apply addition/counting skills to measure perimeter. Can do this practically outside to measure perimeter of benches, fencing, small play area and so on Use and apply multiplication skills to calculate area (if pupils are working at this level)
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Length knowledge and skills:

	B2 P5	B2 P6-8	B2 step 1c-1b	B2 Step 1b-2c	B2 Step 2c-2a	B2 Step 2a-3a
<u>Subject specific knowledge</u> What do pupils need to know?	<u>To know</u> key words: big/small tall/short <u>To know</u> to place objects next to each other to accurately compare inc. from same starting point	<u>To know</u> they can measure lengths using cubes	<u>To know</u> they can measure lengths using cubes, objects or hand-spans Is able to measure using non-standard units, starting from the edge of an object or shape.	<u>To know</u> a ruler measures length <u>To know</u> how to use a ruler correctly: start at zero and not end of ruler, then see where the object ends <u>To know</u> rulers only accurately measure straight objects - not curved. <u>To know</u> cm and mm are units to measure length <u>To know</u> 10 mm = 1cm	<u>To know</u> which is the correct standard unit for a measurement e.g. mm,cm,m,g,kg etc <u>To know</u> what measuring tool is needed to measure something specific	<u>To know</u> how to break down a worded problem related to measure
<u>Subject specific skills</u> What do pupils need to be able to do?	<u>Is able to</u> find big and small objects on request. Experience comparing heights by placing objects next to each other.	<u>Is able to</u> use every day language to talk about size in context and through play: Length and size. <u>Is able to</u> compare and describe lengths	<u>Is able to</u> measure lengths using cubes/objects/ Hand-spans	<u>Is able to</u> measure the perimeter of 2d shapes (cm) <u>Is able to</u> compare and describe lengths and heights using 'double/half' vocabulary	<u>Is able to</u> use standardised measuring tools to measure length.	<u>Is able to</u> solve worded problems related to measure.

	<p><u>Is able to indicate</u> which of two saucepans is the bigger.</p> <p>Experience comparing sizes by placing objects next to each other</p>	<p>and heights using 'long/short, tall short' vocabulary</p>		<p><u>Is beginning to use</u> standardised measuring tools to measure length e.g. ruler (start with whole cm, then move onto cm & mm combined)</p> <p><u>Is able to solve</u> practical problems for length.</p>		
<p><u>Suggested teaching activities</u></p> <p>How should I teach this?</p>	<ul style="list-style-type: none"> Line up toys according to size Measurement stories Compare familiar objects one small and one big 	<ul style="list-style-type: none"> Role play situations with comparative language e.g. shop. Please can I have a long piece of string? Order the length of carrots grown when dug out <p>Compare heights of square block / steps in right hand corner of soft play room</p>	<ul style="list-style-type: none"> Ordering heights of children in the class Measure using hand spans/bricks Compare length of two of the same food grown Measure marked out areas of soft play using hand spans 	<ul style="list-style-type: none"> Measure with ruler/m wheel Have competition of how far chn can run in 30 secs and measure etc Measure marked out areas of soft play using m and cm 	<ul style="list-style-type: none"> Add measurements of shapes/areas together and check with addition method e.g. measure classroom area and add together. Measure area and perimeter of marked out areas of soft play 	