



	1- Quadrilaterals - drawing and naming, properties	2&3 - Quadrilaterals – Area and Perimeter	4-Triangles Drawing, Naming, Properties	
MATHS	<p>Objective: To use conventional terms and notations for quadrilaterals and to draw them.</p> <p>Success Criteria:</p> <p>Support: Compare and classify and draw geometric shapes, including quadrilaterals. (S14)</p> <p>Core: I can compare and classify geometric shapes based on their properties and sizes and find unknown angles in any, quadrilaterals. (S16)</p> <p>Extension: To construct perpendicular lines using a compass and a ruler (GCSE)</p> <p>I can describe, sketch and draw: points, lines, parallel lines, perpendicular lines, right angles, that are reflectively and rotationally symmetric; I can use conventional terms and notations, such as using 'dashes' to indicate equal lengths and (multiple) arrows to indicate parallel lines. (S17)</p> <p>LOtC: Shape hunt from descriptions</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Starter: drawing shapes- squares, rectangle, parallelogram, trapezium, kite, rhombus OR draw the shape from the description (eg. 4 right angles, 4 equals sides) Look at properties of all quadrilaterals and key terminology e.g right angle, perpendicular, parallel, vertices, lines, edges, Show how to draw a perpendicular line using a protractor and then with a ruler and compass Challenge pupils to draw a rectangle, triangle using a compass and ruler (Ext), challenge pupils to draw scale diagram of a rectangle square using a protractors (Support). Plenary: Match the description to the shape using the key terms. / Shape / scavenger hunt around school using only the key terms. 	<p>Objective: To calculate the perimeter and area of quadrilaterals</p> <p>Success Criteria:</p> <p>Support: I can measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. I can find the areas of rectilinear shapes by counting. (S14)</p> <p>Core: Calculate the area of quadrilaterals, including parallelograms and triangles (S16), Recognise where it is necessary to use the formulae for area (S16) I can recognise that shapes with the same areas can have different perimeters and vice versa. (S16), I can recognise that shapes with the same areas can have different perimeters and vice versa. (S16)</p> <p>Extension: I can derive and apply formulae to undertake calculations and solve problems involving perimeter and area of rectangles (S17). Derive and apply formulae to undertake calculations and solve problems involving perimeter and area of rectangles. (S17) I can use calculations and solve problems involving: perimeters of 2-D shapes, parallelograms, trapezia. (S19)</p> <p>LOtC: Go outside/around the school work out the area and perimeter of different rooms or objects e.g. hydro pool, dining room</p> <p>Using IT: Develop a spreadsheet to calculate the perimeter and area for shapes.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Starter; recap from previous lesson, name the shapes (all quadrilaterals) Main: Go through the definitions for area and perimeter Practise questions finding the area and perimeter of shapes e.g. real life situations- how much carpet is needed/how much skirting board / fencing etc... worded problems Plenary: give some questions and possible its answer some of them wrong (e.g. worked out the perimeter when should have worked out the area) – is it the right answer? 	<p>Objective: To draw, name and state the properties of various triangles.</p> <p>Success Criteria:</p> <p>Support: I can Compare and classify geometric shapes, including quadrilaterals and triangles, I can identify acute and obtuse angles and compare and order angles up to two right angles by size. (S14)</p> <p>Core: I can use the standard conventions for labelling and referring to the sides and angles of triangles (GCSE) I can compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. (S16)</p> <p>Extension: I can derive and use the sum of angles in a triangle (GCSE) I can draw diagrams from written description (GCSE) I can use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS) (GCSE)</p> <p>Notes; including knowing names and properties of isosceles, equilateral, scalene, right-angled, acute angled, obtuse-angled triangles</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Starter: Display a variety of different triangles, ask pupils to name them or match the shape to the name. Main: Go through the different types of triangle and their name and properties. Explain the notation for labeling- same angle, same length. Define obtuse and acute. Extension: Give some descriptions and ask pupils to draw the triangle from the description. Core/Support: practice drawing triangle from measurements and descriptions, core add the standard notations. Introduce the idea of congruence Plenary – Are these triangle congruent? Which criteria are applied? Display a selection of triangles with standard notation – which ones are identical in shape and size (i.e. congruent) 	
		5 Area and Perimeter of Triangles	6 &7 - Pythagoras Theorem and Trigonometry (Ext only)	8- Cubes, Cuboids Triangular prisms, pyramids
		<p>Objective: To calculate the area and perimeter of triangles.</p> <p>Success Criteria:</p> <p>Support: I can measure the perimeter of simple 2D shapes. (S13)</p> <p>Core: I can calculate the area of parallelograms and triangles. (S16). (S16)</p> <p>Extension: I can derive and apply the formula to calculate the area of a triangle. (GCSE) I can derive and apply formulae to undertake calculations and solve problems involving: perimeter and area of triangles (S18)</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Starter: Recap from previous lesson display some triangles – name them. Main: Extension- look at a rectangle and turn it into a triangle – use this and the formula for area of a rectangle to work out the area of a triangle Core/Support: go through the formula for the area of a triangle and how to work out the perimeter of a triangle, practice calculations, including worded problems Include converting between units. Plenary: Practice exam question. 	<p>Objective: To calculate the length of sides of a triangle.</p> <p>Success Criteria:</p> <p>Support: I can measure, compare, add and subtract length (S13)</p> <p>Core: I know angles are measured in degrees; I can estimate and measure them and draw a given angle, writing its size in degrees (S15)</p> <p>Extension: I can use Pythagoras' Theorem to solve problems involving right-angled triangles (S19, GCSE) I can use trigonometric ratios in similar triangles to solve problems involving right-angled triangles. (S20)</p> <p>Using IT: Use of scientific calculator for trigonometry.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Starter; Display a triangle, given the perimeter, and the length of two sides, work out the length of the other side. Main: Go through Pythagoras theorem and how to use to Practical demonstration of how Pythagoras' work, (cut and stick using squared paper) to physically show $a^2+b^2=c^2$ Use a protractor and ruler to draw triangles with given dimension including angles Plenary: calculations using Pythagoras theorem. Extension only: SOH CAH TOA; using trigonometry to calculate the length of sides or the value of the angle. 	<p>Objective: I can identify and perform calculations for 3D shapes.</p> <p>Success Criteria:</p> <p>Support: I can identify 2D shapes on the surface of 3D shapes, e.g. a circle on a cylinder and a triangle on a pyramid. (S12) I can recognise and name common 2D and 3D shapes including; 2D rectangles, squares, circles and triangles and 3D cuboids, cubes, pyramids and spheres (S11)</p> <p>Core: I can recognise where it is necessary to use the formulae for area and volume of shapes. (S16) I can identify 3D shapes, including cubes and cuboids, from 2D representations. (S15) I can recognise, describe and build simple 3-D shapes, including making nets. (S16) I can calculate, estimate and compare volume of cubes and cuboids using units including centimetre cubed and cubic metres. (S16)</p> <p>Extension: I can derive and apply formulae to undertake calculations and solve problems involving volume of cuboids (including cubes). (S18) I can identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres (GCSE)</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> Starter: Identifying 2d shapes on the surface of 3d shapes Main; 3D versions of quadrilaterals and other shapes, naming and drawing, define planes, define number of vertices, sides, planes Calculation of surface area surface area and volume of spheres, pyramids, Calculation of volume including converting between units Use an Archimedes can to work out the volume and compare this with the calculated volume. Plenary: Using spaghetti and marshmallows to build 3D models of shapes OR: Using nets to make 3D models



	9,10- Angles	11- Circles, drawing and properties	12- Circumference of a circle
	<p>Objective: To work out the value of angles in different situations.</p> <p>Success Criteria: Support: I can recognise angles as a property of shape and associate angles with turning. (S13) I can identify acute and obtuse angles and compare and order angles up to two right angles by size. (S14) Core: I know angles measured in degrees; estimate and measure them and draw a given angle, writing its size in degrees. (S15) Extension: I can use alternate and corresponding angles on parallel lines (GCSE), I can apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles (GCSE)</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: Recap what do the angles in a rectangle, square, triangle straight line add up to? • Look at parallel lines and notation used • Extension: Corresponding, supplementary and alternate and angles and the rules for working the angle size out. Practise questions- good sheet available on maths drills • Core/Support: Practise using a protractor to measure angles • Plenary: Display various angles have pupils estimate the size then measure or calculate it, include names for angles, right angle, obtuse, acute. 	<p>Objective: To draw and state the properties of a circle.</p> <p>Success Criteria: Support: I can draw 2D shapes (S13) , I can recognise angles as a property of shape (S13), I can recognise and name common 2D and 3D shapes including; 2D rectangles, squares, circles and triangles and 3D cuboids, cubes, pyramids and spheres (S11) Core: I can illustrate and name parts of circles, including radius, diameter and circumference. (S16) Extension: I can identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference, tangent, arc, sector and segment (GCSE) LotC:</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: • Main; Practise using a compass to draw circles to a given size. • Name the parts of a circle- do a memory test – display the labelled diagram for 2 minutes and then try to recreate it. • Look at the total of angles in a circle – use a protractor to measure it. Use a protractor to draw segments of a given size. • Plenary: Make a video or set of instructions how to use a compass 	<p>Objective: To calculate the circumference of a circle.</p> <p>Success Criteria: Support: I can measure the perimeter of simple 2D shapes (S13) Core: I can calculate perimeters of 2D shapes, including circles (GCSE) Extension; I can apply the formulae to work out the circumference of a circle. (GCSE) I know the formulae: circumference of a circle = $2\pi r = \pi d$ LotC: Real life situations to know the circumference of a circle. Using IT: Develop a spreadsheet to calculate the perimeter and area for shapes.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: Revision perimeter of rectangles, squares • How could you measure the circumference of a circle • Look at other way to measure the perimeter e.g. using string, is this accurate? • Introduce pie (π) and its value and how to use it for calculating the circumference of a circle. • Practise calculations • Plenary: look at real life situations when we may need to know the circumference of a circle.
	<p>13- Area of a circle</p> <p>Objective: To calculate the area of a circle.</p> <p>Success Criteria: Support: I can find the areas of shapes by counting. (S14) Core: I can calculate compare and estimate the area of irregular shapes. (S17) Extension: I can apply the formulae to work out the area of a circle I know the formula: area of a circle = πr^2 (GCSE) I can undertake calculations and solve problems involving areas of circles and composite shapes. (S20) LotC: Real life situations to know the area of a circle.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: Draw a circle with given dimensions • Try and find the area of a circle by counting squares- how accurate is this? Is it easy or difficult? • What would be a better method? • Revisit pie and introduce the formula • Practise calculations, including worded problems • Plenary: real life situation to work out the area of circle, e.g. grass seed for a circular patch of grass. 	<p>14- Cylinders and Spheres, Cones</p> <p>Objective: To name, draw and use formula to calculate area or volume of cylinders and spheres and cones.</p> <p>Success Criteria: Support: I can identify 2D shapes on the surface of 3D shapes, e.g. a circle on a cylinder and a triangle on a pyramid. (S12) I can recognise and name common 2D and 3D shapes including; 2D rectangles, squares, circles and triangles and 3D cuboids, cubes, pyramids and spheres (S11) Core: I can recognise where it is necessary to use the formulae for area and volume of shapes. (S16) I can identify 3D shapes, including cubes and cuboids, from 2D representations. (S15) I can recognise, describe and build simple 3-D shapes, including making nets. (S16) I can calculate, estimate and compare volume of cubes and cuboids using units including centimetre cubed and cubic metres. (S16) Extension: I can calculate surface area and volume of spheres, pyramids, cones and composite solids (GCSE) I can calculate volume of prisms incl. cylinders.(S20)</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Look at the 3D shapes identify the 2D shapes on the surface • Calculations of surface area and volume • Practise re-arranging formula • Making paper models using nets • Look at formula to calculate volume, and surface area • Use an Archimedes can to work out the volume and compare with calculated value. 	<p>15- Polygons</p> <p>Objective: To name, draw and state some properties of polygons.</p> <p>Success Criteria: Support: I can plot specified points and draw sides to complete a given polygon. (S14) Core: I can distinguish between regular and irregular polygons based on reasoning about equal sides and angles. (S15) I can compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. (S16) Extension: I can derive and use the sum of angles in a triangle to deduce and use the angle sum in any polygon, (GCSE)</p> <p>Notes: Including knowing names and using the polygons: pentagon, hexagon, octagon and decagon.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: Naming various polygons, looking at prefixes and what each prefix means • Drawing polygons / Using art straws of a fixed length to make polygons. • Look at rules for calculating angles in a polygon • Look at the number of triangles that make each polygon and work out the angles with in the shape. • Look for irregular polygons- what is the difference with a regular polygon • Plenary: Display images or a 'pupils' and name shapes them incorrectly – pupils to correct the work.



	16 - Reflections and Rotations	17- Translations	18- Enlargements
	<p>Objective: To reflect and rotate an image or shape.</p> <p>Success Criteria:</p> <p>Support: I can identify lines of symmetry in 2D shapes presented in different orientations. (S14), I can recognise that two right angles make a half-turn, three make three quarters of a turn and four make a complete turn. (S13)</p> <p>Core: I can Identify, describe, and represent the position of a shape following a reflection or translation using appropriate language, and know that the shape has not changed. (S15) I can Identify; multiples of 90 degrees, angles at a point on a straight line and half a turn (total 180 degrees), angles at a point and one whole turn (total 360 degrees) (S15)</p> <p>Extension: I can identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (GCSE)</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: • Discuss lines of symmetry and identify • Revise/discuss ideas of congruence and similarity 	<p>Objective: To perform translation on a shape or image.</p> <p>Success Criteria:</p> <p>Support: I can describe positions on a 2D grid as coordinates in the first quadrant. (S14)</p> <p>Core: I can draw and translate simple shapes on the coordinate plane, and reflect them in the axes. (S16)</p> <p>Extension: I can identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (GCSE) I can describe translations as 2D vectors, I can apply addition and subtraction of vectors, multiplication of vectors by a scalar, and diagrammatic and column representations of vectors (GCSE)</p> <p>LotC: Draw a large quadrant on the playground in chalk and use this for translations.</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: Display a grid with a shape or co-ordinates, ask pupils the co-ordinates for a given point. • Main: demonstrate how to use vector for a translation • Practice performing a translation, look at how to interpret vectors • Plenary: Pupils to draw a shape and then swap books and translate the image. OR play Battleships. 	<p>Objective: To enlarge a shape or image.</p> <p>Success Criteria:</p> <p>Support: I can recognise 3D shapes in different orientations; and describe them with increasing accuracy (S13)</p> <p>Core: I can solve problems involving similar shapes where the scale factor is known or can be found (S16) I can draw and measure line segments and angles in geometric figures, including interpreting scale drawings. (S19)</p> <p>Extension: I can identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (GCSE)</p> <p>Suggested Activities:</p> <ul style="list-style-type: none"> • Starter: spot the different – display different images of shapes that have been shrunk, enlarged, rotated, reflected - ask pupils to identify what the different is. Introduce using key words • Introduce concept of scale and scale diagrams e.g blue prints • Look at performing enlargements • Look at scale diagrams or scales on maps • Calculation from maps using the scale. • Plenary: Practise exam question or worded question