Shape, Position and Movement

Fife Numeracy and Mathematics Overview for Shape, Position and Movement:

- Provides a **brief overview** of progression within Shape, Position and Movement
- **Aligns with** the ***Fife Shape, Position and Movement Progression Pathway***
- **Should be used** in **conjunction** with the ***Fife Numeracy and Mathematics Progression Pathway*** which exemplifies how to plan for Conceptual Understanding in Numeracy
- **Should not be used** as a standalone document.
- **Can be used** as part of **professional dialogue** in relation to **Teacher Professional Judgement**

	Second		Third			Fourth		
	Phase 6	**Phase 7**	**Phase 8**	**Phase 9**	**Phase 10**	**Phase 11**	**Phase 12**	**Phase 13**
	Properties of 2D Shapes and 3D Objects key vocabulary: angle, area, circle, circumference, compasses, congruent, cubes, cuboids, diameter, diagonals, edges, faces, geometric reasoning, hypotenuse, irregular polygons, nets, polyhedra, prisms, pyramids, Pythagoras' theorem, radius, regular polygons, similarity, solids, space, surface, triangles, trigonometry, vertices, visualisation							
Properties of 2D Shapes and 3D Objects	• I can create nets of 3D objects using 3D objects to create a template. • I can discuss similarities and differences between regular and irregular polygons. • I can create skeletons of a prism and pyramid from a set of measurements. • I can draw 2D shapes and representations of 3D objects using square and isometric paper. • **I can match prisms and pyramids with their net.** • I can interpret 2D drawing of 3D models using cubes (ability to build the unseen sections) • I can identify corresponding faces on a 3D model from a net without folding the net (e.g. where would the red face be on a cube) • I can link features such as rigidity and flexibility to structures (e.g. benefits of 2D shapes and 3D objects in construction) • **I can use technology to create 2D shapes and 3D objects and understand that not all parts may be seen.** • **Use and understand the terms circumference, radius, and diameter to describe a circle**	• **I can use a range of mathematical language to describe 2D shapes and 3D objects (regular, irregular, vertices, vertex, edges, faces, diagonals, angles) correctly and consistently.** • I can sort regular and irregular polygons. • I can describe and model regular and irregular polygons. • I can draw prisms, pyramids, cuboids, cones, and cubes recognisably using various mathematical tools. • **I can use the relationship between diameter and radius to draw circles of different sizes using a pair of compasses.**	• I can use mathematical language to describe shapes and objects. • I can identify and describe properties of 2D and 3D shapes. • I can recognise and describe regular and irregular shapes. • I can explore the properties of circles. • I can understand that shapes can be represented as nets and models. • I can begin to relate 2D nets to 3D objects. • I can use simple visualisation to recognise shapes and structures. • I can use basic mathematical instruments to draw shapes.	• I can analyse and describe regular and irregular polyhedra using appropriate mathematical vocabulary. • I can understand and describe congruent and similar shapes. • I can explore and describe the relationships between 2D shapes and 3D objects using nets. • I can create and model nets to represent 3D objects. • I can draw different views of prisms and solids. • I can use a range of mathematical instruments to draw shapes accurately. • I can apply geometric ideas and relationships to solve problems. • I can use visualisation strategies to support problem solving. • I can construct shapes accurately to solve problems.	• **I can demonstrate a variety of methods to accurately draw 2D shapes, including triangles and regular polygons, using mathematical instruments.** • **I can construct accurate 2D shapes using appropriate mathematical instruments.** • **I can construct nets of 3D objects and use them to build models.** • **I can identify, describe, and model congruency and similarity in 2D shapes.** • **I can analyse properties of shapes and apply this to solve problems.** • **I can use geometric reasoning and visualisation to solve complex shape problems.** • **I can apply my understanding of shape, space, and relationships in a range of contexts.**	• I can explore the relationship between the sides of a right-angled triangle. • I can explore the relationship between the sides and angles in a right-angled triangle. • I can explore the relationship between the circumference and radius of a circle. • I can explore the relationship between the radius and area of a circle. • I can begin to use Pythagoras' Theorem to calculate the hypotenuse of a right-angled triangle. • I can begin to calculate the length of a shorter side using Pythagoras' Theorem. • I can begin to use trigonometry to find missing sides in a right-angled triangle. • I can begin to use trigonometry to find the size of an angle in a right-angled triangle.	• I can use Pythagoras' Theorem to calculate the length of any side in a right-angled triangle. • I can use the converse of Pythagoras' Theorem to check if a triangle is right-angled. • I can use trigonometry to calculate the length of a side in a right-angled triangle. • I can use trigonometry to calculate the size of an angle in a right-angled triangle. • I can calculate the circumference of a circle using the formula $C = 2\pi r$ or $C = \pi d$. • I can calculate the area of a circle using the formula $A = \pi r^2$. • I can calculate the radius or diameter when given the area or circumference. I can apply these skills to solve problems in familiar contexts.	• **I can calculate the length of any side of a right-angled triangle using Pythagoras' Theorem.** • **I can calculate the size of an angle in a right-angled triangle using trigonometry.** • **I can calculate the length of a side in a right-angled triangle using trigonometry.** • **I can use formulae to calculate the circumference of a circle.** • **I can use formulae to calculate the area of a circle.** • **I can calculate the diameter and radius of a circle when given the area or circumference.** • **I can solve real-life problems involving Pythagoras' Theorem.** • **I can solve real-life problems using trigonometry.** • **I can solve real-life problems involving the area and circumference of circles.**
	Second		**Third**			**Fourth**		
	Phase 6	**Phase 7**	**Phase 8**	**Phase 9**	**Phase 10**	**Phase 11**	**Phase 12**	**Phase 13**
	Angle, symmetry and transformation key vocabulary: acute angle, alternate angles, angle notation, bearings, Cartesian grid, complementary angles, compass directions, compass rose, congruent, corresponding angles, coordinates, diameter, enlargement, exterior angles, grid references, interior angles, intersecting lines, linear scale factor, parallel lines, perpendicular lines, protractor, quadrants, quadrilaterals, radius, reflex angle, reflection, rotation, rotational symmetry, routes, scale, scale factor, semi-circle, similarity, straight angle, supplementary angles, symmetry, tangent, tessellation, transformations, translation, triangles, vertically opposite angles, visualisation							
Angle, Symmetry and transformation	• I can relate angles of 45 degrees to the 8-point compass rose. • I can use conventional maps to find location and routes that meet criteria (e.g. safest route, closest post office) • I can record routes that involve turning. • I can explore scale. • I can identify and describe lines of symmetry in 2D shape. • I can take a shape that already tessellates and change it using transformations (slide, flip, turn) to create a new shape that still tessellates. • **I can produce designs that exhibit a specified symmetry, translation, or reflection (e.g. fold paper, use mirror or computer graphic)** • I can experiment with protractors to measure angles. • I can explore acute, obtuse, and reflex angles by comparing to right angles and straight angles. • I can explore complementary, corresponding, and supplementary angles	• **I can use simple scale to calculate actual size or distance (e.g. 1cm = 2km)** • **I can enlarge models made with cubes to a small whole number scale (e.g. double size of model)** • **I can create routes and follow that use 8-point compass directions.** • I can visualise movements of objects through different orientations (e.g. imagine what a shape would look like if it rotated 90 degrees left) • **I can create and explain complex symmetrical patterns and tessellation.** • **I can measure and draw angles accurately using a protractor to within +/-2 degrees.** • **I know the relationship between complementary, corresponding, and supplementary angles and use this information to calculate missing angles.** • I can describe and use the sum of the angles in a triangle and quadrilaterals in problem solving activities. • I can calculate interior and exterior angles	• I can understand systems used to describe position and direction. • I can explore coordinates in the first quadrant. • I can plot and describe points using coordinates. • I can recognise and use simple grid references. • I can describe direction using basic compass points. • I can understand the relationship between bearings and a compass. • I can explore line symmetry and identify lines of symmetry in 2D shapes. • I can create simple symmetrical patterns and pictures. • I can explore translations, reflections, and rotations. • I can describe and use basic angle vocabulary. • I can recognise different types of angles. • I can begin to understand angle properties in triangles and quadrilaterals. • I can explore scale and recognise when shapes are enlarged or reduced.	• I can use the Cartesian coordinate system in all four quadrants. • I can read, plot, and describe locations using coordinates. • I can measure and draw simple bearings. • I can use bearings and compass directions to describe position and direction. • I can create and describe routes using distance, direction, and angle. • I can apply translations, reflections, and rotations on a coordinate grid. • I can identify corresponding, alternate, and vertically opposite angles. • I can describe parallel, perpendicular, and intersecting lines. • I can classify triangles by their sides and angles. • I can use the angle sum of a triangle and quadrilateral to find missing angles. • I can calculate complementary and supplementary angles. • I can use scale to enlarge and reduce shapes. • I can identify and use scale factors. • I can interpret scale in simple real-life contexts.	• **I can name angles using correct notation (e.g. ∠ABC).** • **I can identify corresponding, alternate, and vertically opposite angles.** • **I can use angle properties of triangles and quadrilaterals to calculate missing angles.** • **I can apply my understanding of scale to enlarge and reduce shapes using a linear scale factor.** • **I can use bearings in real-life and navigational contexts, including creating scale drawings.** • **I can plot and describe a location using coordinates on a grid.** • **I can identify all lines of symmetry in 2D shapes.** • **I can create accurate symmetrical patterns and designs.** • **I can apply my understanding of position, direction, and geometry to solve problems.**	• I can read and plot coordinates on a four-quadrant Cartesian grid. • I can apply translations and reflections to points, lines, and shapes on a four-quadrant grid. • I can describe rotational properties of shapes, including the order of rotation. • I can recognise and describe symmetry in shapes, patterns, and real-life objects. • I can explore the relationship between the tangent and radius in a circle. • I can explore the relationship between angles in triangles, including those in a semi-circle. • I can recognise similar and congruent shapes. • I can use a given scale factor to enlarge or reduce shapes.	• I can accurately plot and describe coordinates in all four quadrants. • I can apply and describe transformations, including translations, reflections, and rotations, on a grid. • I can use rotational symmetry to complete and create designs. • I can apply my understanding of symmetry in a range of contexts. • I can apply the relationship between a tangent and radius to calculate missing angles. • I can apply knowledge of angles in a semi-circle to solve problems. • I can identify triangles formed within circles and use their properties. • I can calculate scale factors for enlargements and reductions. • I can use similarity to find unknown lengths in 2D shapes. • I can begin to apply area and volume scale factors in problem solving.	• **I can use a four-quadrant Cartesian grid to read and plot coordinates accurately.** • **I can demonstrate transformations by reflecting, translating, and rotating objects on a four-quadrant grid.** • **I can rotate objects accurately and describe rotational symmetry.** • **I can use similarity to find unknown lengths and areas of 2D shapes.** • **I can apply knowledge of the relationship between the tangent and radius to calculate missing angles.** • **I can apply knowledge of angles in a semi-circle to solve problems.** • **I can apply my understanding of scale, similarity, and geometric relationships to solve real-life problems.**