NORTH GOWER PARTNERSHIP

THREAD: Shape and Symmetry **AOLE: Mathematics and Numeracy**

Progression Step 1		
Knowledge and Skills	**Vocabulary**	**Experiences and Characteristics**
Play with and explore 2D and 3D shapes e.g which shapes roll, which shapes are best for building towers etc. Start to recognise and name 2D and 3D shape. How do shapes feel? – which shapes have curved edges, straight edges etc. Compare shapes Sort shapes according to their properties Repeating Patterns	shape, pattern, line, curved, straight, round, solid, corner, side, edge, sort, 3D SHAPES, three-dimensional, cube, cuboid, pyramid, sphere, cone, cylinder, 2D SHAPES, two-dimensional, circle, semi-circle, triangle, square, rectangle, rectangular, Symmetrical	**Essential:** Having the opportunity to recognise shapes outdoors. Build models with shapes Construction areas

Opportunities to develop proficiencies

Conceptual understanding
Use knowledge of shapes e.g. to find the best wooden blocks to build a tower

Communication using symbols
I can create a link between pictures of shapes and real-life examples.

Fluency
Recognise and name 2D and 3D shapes, sort a set of shapes, look at relationships between shapes e.g. which shapes have 4 sides? Which shapes roll?

Logical reasoning
Explain ways in which shapes have been sorted e.g. all the shapes with 4 sides, all the shapes with curved sides. Explain shape patterns.

Strategic competence
Suggest what shape comes next in a given pattern, say what shape is in the feely bag by feeling the number of sides, corners etc.

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Progression Step 2		
Knowledge and Skills	**Vocabulary**	**Experiences and Characteristics**
Name and explore the properties of 2D and 3D shape and start to explore the relationship between both. Compare shapes. Sort shapes according to their properties Identify one line of reflective symmetry. Sort different shapes according to their different properties in different contexts. Look at different types of shapes and sort into symmetrical and non-symmetrical.	SHAPE AND SPACE shape, pattern, line, curved, straight, round, hollow, solid, corner, side, edge, sort 3D SHAPES, three-dimensional, cube, cuboid, pyramid, sphere, hemisphere, spherical, cone, cylinder, cylindrical, prism 2D SHAPES, two-dimensional, circle, circular, semi-circle, triangle, right angled triangle, triangular, square, rhombus, rectangle, rectangular, pentagon, hexagon, heptagon, octagon, polygon, quadrilateral, kite, parallelogram, trapezium, oval Symmetrical, non-symmetrical, horizontal and vertical	**Essential:** Build models with shapes Having the opportunity to recognise shapes and symmetry outdoors.

Opportunities to develop proficiencies
Conceptual understanding Use knowledge of shapes e.g. to find the best wooden blocks to build a tower **Communication using symbols** I can create a link between pictures of shapes and real-life examples. **Fluency** Recognise and name 2D and 3D shapes, sort a set of shapes, look at relationships between shapes e.g. which shapes have 4 sides? Which shapes roll? **Logical reasoning** Explain ways in which shapes have been sorted e.g. all the shapes with 4 sides, all the shapes with curved sides. Explain shape patterns. **Strategic competence** Suggest what shape comes next in a given pattern, say what shape is in the feely bag by feeling the number of sides, corners etc.

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Progression Step 3		
Knowledge and Skills	**Vocabulary**	**Experiences and Characteristics**
Name and understand the properties of 2D and 3D shape. Understand the relationship between 2D and 3D	shape, pattern, plane, line, curved, straight, round, hollow, solid, corner point, side, edge, end sort, make, build, construct, draw, sketch centre, radius, diameter circumference, concentric, arc, net, surface, angle, right-angled, congruent	**Essential** To make nets from various materials Use digital technology to explore symmetry of 2D shapes.

Identify the number of sides, vertices and diagonals of range of 2D shape. Identify the number of edges, faces and vertices of range of 3D shape. Understand the difference between parallel and perpendicular lines. Identify lines of symmetry and order of rotation within shapes. To reflect in mirror lines and complete an image and a rotational symmetry of various orders. Formula to find the perimeter and area of 2D shapes. (Squares/Rectangle). Recognise nets of simple 3D shapes (cube, cuboid, triangular prism, cylinder, square based pyramid, tetrahedron).	intersecting, intersection, plane base, square-based vertex, vertices, layer, diagram, regular, irregular concave, convex open, closed, tangram 3D SHAPES, three-dimensional, cube, cuboid, pyramid, sphere, hemisphere, spherical cone cylinder, cylindrical, prism, tetrahedron, polyhedron, octahedron, dodecahedron 2D SHAPES, two-dimensional, circle, circular, semi-circle, triangle, triangular equilateral triangle, isosceles triangle, scalene triangle, square, rhombus rectangle, rectangular, oblong, pentagon, pentagonal, hexagon, hexagonal heptagon, octagon, octagonal, polygon, quadrilateral, kite, parallelogram, trapezium Rotation, reflection, symmetry.	**Enrichment** Having the opportunity to explore shape and symmetry outdoors.

Opportunities to develop proficiencies

Conceptual understanding
I can make connections so that mathematical concepts can be transferred during play and classroom activities.
Eg. Make shapes using Polydron or similar products

Communication using symbols
I can use appropriate notation, symbols and units of measurement.
Eg. Square has equal sides.

Fluency
I can identify relevant facts and techniques in order to apply an efficient method.
Eg. Sorting 2-d shapes.

Logical reasoning
I can use everyday and mathematical language to talk about and explain my own ideas and choices.
Eg. Identify shapes within their own construction.

Strategic competence
I can identify the required information, and select appropriate equipment and resources.
Eg. Using Deines to create regular and irregular common 2d shapes.

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Progression Step 4		
Knowledge and Skills	**Vocabulary**	**Experiences and Characteristics**
To construct lines and shapes using ruler and compass. Understand that some shapes are congruent and others similar. Understand the relationship between the sides of right-angled triangles in the context of Pythagoras' theorem and the areas of the squares adjoining the sides. Transformations of shapes including: Rotation: 90°, 180°, 270°, 360° Reflections: Horizontal, Vertical and Diagonal on a set of axes and given mirror line e.g. x=3 or y=x Enlargements by positive, fractional and negative scale factors Translations via horizontal and vertical descriptors	Perpendicular bisector Congruent, Similar Pythagoras Square Square Root Hypotenuse Opposite Adjacent Pythagorean triples Rotate Reflect, Translate Enlarge Scale Factor Vector Origin Transformations	**Enrichment:** To visualise Pythagoras theorem using digital media. To explore transformations using digital media.

or vector notation		

Opportunities to develop proficiencies

Conceptual understanding

I understand that Pythagoras' theorem is a property that defines a right -angle triangle.

Communication using symbols

I can label correctly and to use Pythagoras' theorem in its correct notation.

Fluency

I can apply squares and square roots and use a formula in its format or rearranged format. I can use prior knowledge of symmetry and right angled triangles to tackle problems.

Logical reasoning

I can use my understanding of symmetry to extend completing transformations. I can justify which transformation has been drawn using the appropriate language.
I can apply Pythagoras' theorem to more abstract or multi step questions where one side must be calculated before the required side can be found.
I can prove a shape is right-angled or not by applying Pythagoras' theorem.

Strategic competence

I can identify, measure or obtain required information to complete the task. e.g. picking out relevant information to complete a transformation.