Primary Mathematics Curriculum

Shape

Children should be given opportunities to demonstrate how the knowledge and skills gained in this strand can be used to link, reinforce and progress learning across the other four interconnected strands.

Elements	a The learner	b The learner	c The learner	d The learner	e The learner	f The learner	g The learner	h The learner	i The learner	j The learner	k The learner
Shape											
Understanding and Connecting	Explores shapes in the environment.	Identifies and recognises shapes in the environment.	Identifies and describes simple geometrical properties of some shapes [number of sides, corners, faces; straight/curved sides; ability to roll, stack or slide]. Recognises and names common 3-D and 2-D shapes in different orientation and sizes.	Identifies 2-D shapes as the faces of 3-D solids. Explores the combinations of shapes to create 2-D and 3-D models [taking into consideration their unique properties].	Compares properties [faces, sides, corners, vertices] of shapes. Models 2-D and 3-D shapes using materials or through drawing.	Recognises square and non-square corners in the environment, identifying square corners as right angles, or a quarter of a turn. Dissects and/or constructs 3-D shapes using modelling materials.	Explores and investigates properties of shapes including symmetry, lines and angles. Analyses properties of shapes (For example: The nature of lines and angles).	Compares and classifies 2-D geometric shapes, including quadrilaterals and triangles, based on their properties [regular/irregular; acute, obtuse, or reflex angles; parallel and perpendicular, lines; symmetry].	Explores and identifies the properties of the circle. Construct and measure angles of different types of triangles. Investigates the sum of the angles in a triangle. Explores the positions and types of angles [internal and external] in shapes.	Writes minimal defining lists to define shapes. Understands connections between classes of shapes (For example: all squares are rectangles; some rectangles are squares).	Investigates the sum of the angles in quadrilaterals. Describes the properties of shapes and explains how unknown angles and lengths can be derived from known measurement(s).
Communicating	Attends to language describing the appearance and properties of shapes and objects.	Explores shape properties and functions, and describes using everyday language.	Discusses similarities and differences between shapes. Selects appropriate materials/digital tools to explore and represent shape.	Justifies why a particular shape belongs to a shape family with reference to simple properties. Asks questions about the properties of shapes to determine their identity.	Analyses and discusses the results of shape sorting activities using appropriate mathematical language. Describes the key differences and similarities of shapes according to their properties.	Represents classification of shapes according to common properties [number/type of sides/faces, right angle corners or symmetry] using tables or diagrams (For example: using a two-way Carroll diagrams).	Selects and justifies criteria for the classification of a diverse range of shapes.	Represents logical classification of an increasing number of shapes on suitable diagrams or tables (For example: using Venn Diagrams which do/do not overlap or Two and Four-way Carroll Diagrams).	Makes inferences about the effects of dissecting 2-D and 3-D shapes. Selects appropriate materials/digital tools to create precise diagrams of shapes using units of measurement.	Creates and/or interprets labelled drawings to demonstrate or justify ideas about geometrical relationships (For example: elements of a circle or angles of a triangle).	Uses simple programming to construct models. Creates diagrams to show that any polygon can be split into a number of triangles and uses this to conjecture about the sum of angles in a polygon.

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Elements							**Shape**				
Reasoning	Explores and investigates different shapes.	Discriminates between shapes, identifying when one shape is similar or different to another. Identifies why an object or set of objects is different or does not belong to a familiar category.	Selects appropriate criteria for shape sorting. Explains how shapes have been sorted. Sorts, compares and classifies 2-D and 3-D objects into logical categories according to their attributes For example: non-geometrical properties such as colour), size and geometrical properties.	Compares and sorts common 2-D and 3-D shapes and everyday objects. Explains and justifies why shapes belong or do not belong to certain sets.	Compares and contrasts shapes and shape families based on their properties. Sorts an increased range of shapes according to at least two properties.	Conjectures and justifies about whether an unfamiliar shape belongs to a certain category.	Explores and describes the relationships of 3-D shapes with constituent 2-D shapes. Visualises and describes how 3-D solids will look when deconstructed into nets. Makes generalisations about shapes based on understandings of their properties (For example – two right-angled triangles of equal dimensions can combine to make a square).	Devises nets for simple 3-D shapes, identifying when more than one net is possible. Visualises, and makes conjectures about the possible effects of dissecting shapes [2-D and 3-D]. Justifies the reasonableness of estimated measures of angles of shapes. Uses a protractor to test estimations; to compare and order angles.	Uses estimation and measurement to reason about the relationships between radius, circumference and diameter of a circle Visualises and checks with suitable materials or technology whether given nets will make specified 3-D shapes. Uses known properties of familiar shapes (triangles, rectangle etc.) to deduce related facts and find missing lengths and angles.	Makes and justifies inferences about relationships between and within groups of shapes (For example: all quadrilaterals have four sides; Some quadrilaterals have parallel sides; If a quadrilateral has a pair or parallel sides, then it is a trapezium). Uses angle sum facts to make deductions about missing angles. Investigates, calculates and reasons about ways to calculate the surface area of 3-D shapes.	Investigates, and reasons about ways to calculate the volume of simple 3-D shapes. Devises nets of complex 3-D shapes. Draws and labels quadrilaterals specified by co-ordinates in the four quadrants, predicting missing coordinates using the properties of shapes.

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Elements						**Shape**					
Applying and Problem-Solving	Acknowledges the presence of shapes in their immediate environment.	Selects appropriate shapes for a purpose. Combines 2-D shapes to create simple images and 3-D shapes to create structures.	Combines shapes to create more complex images and structures, taking into consideration their unique properties.	Selects materials and/or uses technology to construct or represent shapes. Solves tasks and problems involving shapes [2-D and 3-D shapes] (For example: identifies the properties of 3-D shapes that make them suitable for particular real-life purposes).	Deconstructs and reconstructs everyday items (For example: using containers or packaging). Combines and partitions 2-D shapes (For example: using tangrams/ pattern blocks) Presents a wide range of purposes for the potential use of 2-D and 3-D shapes. Sorts 2-D shapes according to whether they contain right angles or not.	Solves problems requiring the greatest or least number of 2-D shapes needed to compose a larger 2-D shape in a variety of ways. Solves tasks and problems involving technology/ virtual manipulatives.	Designs and makes accurate models of 2-D and 3-D shapes using a variety of materials (For example: collections of models could be developed in consideration of common properties). Constructs tessellations from regular polygons and identifies which regular polygons can tessellate and why. Explores the area of rectangles using materials or grids.	Constructs and de-constructs 3-D shapes from net designs. Solves tasks and problems involving regular and irregular shapes [2-D and 3-D shapes] (For example: decomposing 2-D shapes to find the area of composite shapes). Dissects 3-D shapes and explores how properties of the component parts change or stay the same.	Constructs circle of given radius or diameter and explores how circumference changes as radius/diameter changes. Uses instruments (For example: rulers, compasses and protractors) to construct or measure 2-D and 3-D shapes in a range of meaningful contexts.	Given defined dimensions or criteria, constructs a model/ structure. Constructs triangles and quadrilaterals from given line and/or angle measurements. Solves angle-relationships problems involving triangles (For example: finding interior angles or complimentary angles) and intersecting lines.	Makes connections between 2-D representations [illustrations or models] and 3-D objects to visualise and solve problems. in meaningful contexts (For example: construct 3D models from 2D plans and elevations). Uses software or code to construct and manipulate shapes. Solves angle-relationships problems involving triangles and quadrilaterals.