Willow Dene School Scheme of Work
MATHS: 2D and 3D Shape

About this Scheme of Work: This unit explores 2D and 3D Shape. The focus on 2D and 3D Shape enables children to have lots of experience of exploring the form, shape and properties of flat and solid shapes and objects. It allows them opportunities to explore and develop an understanding of the ways different shapes interact with one another and introduces the names of common 2D and 3D shapes.

Teaching in this Scheme of Work needs to focus on both:

- Naming 2D and 3D shapes
- Exploring, naming and describing the properties of 2D and 3D shapes.

In order to understand the abstract concepts of the properties of shape, such as lines surfaces and solid, children need lots of opportunities for concrete experiences to perceive them. They need opportunities to explore the form and shape of objects using many body parts and in different positions. They also need chances to explore their properties, such as trying to stack cylinders, cups or bricks to develop an understanding of the ways different shapes interact with one another. Each section of the Scheme of Work is split into two rows – the first is 2D Shape, the second is 3D Shape, although there are opportunities for overlap between the two which should be exploited.

VOCABULARY:
Own names, yes, no, more, finished, like, don't like, stop, go, ready
• Words related to comparison, including: same, different, large, , larger, largest, big, bigger, biggest, small, smaller, smallest • Words related to 2D shape names, including: shape, circle, square, rectangle, triangle, star, oval, circular, triangular, rectangular, pentagon, hexagon, octagon, quadrilateral • Words related to 3D shape names, including: cube, cone, cuboid, pyramid, sphere, cylinder, prism • Words related to shape properties, including: straight, curved, round, flat, solid, hollow, point, surface, right angle, line, 2D, 3D • Words related to exploring the properties of shapes, including: pattern, roll, slide, make build, draw • Words related to shape characteristics, including: sides, corner, edge, end

RESOURCES:	
• Natural objects of different shapes • A range of 2D shapes of different sizes and colours • Chalk or masking tape to make big shape outlines on the floor • Real objects of different shapes • Cars, car mats, trains • Feely bags • Shape pastry cutters • Roamer / Pip • Drawing packages on the computer • Sticky 2D shapes • Dough, plasticine and clay	• A collection of 3D solids • A selection of balls of different sizes and textures, e.g. golf balls, table tennis balls, cricket balls, tennis balls, footballs, basketballs, physio balls, etc. • Home corner equipment and play food • Various shaped packaging – e.g. Toblerone boxes, Oxo cube boxes, Cornetto packaging, Smartie tubes, etc • Musical instruments • Building bricks • Reclaimed materials

LEARNING OBJECTIVES	**POSSIBLE TEACHING ACTIVITIES**
• To show an interest in the different properties of 2D shapes • To show recognition of circles and squares • To match 2D shapes • To group or sort 2D shapes by attributes or properties of shape or size	• Sing shape songs – (see "Shape Songs" on x:\ drive) with lots of visual / kinaesthetic props, e.g. real objects of various shapes; drawing shapes in the air; pictures of different shapes; shapes to feel; etc. • Print with shapes. Have a range of different sized circles, squares, triangles, etc and ask students to make prints that have all circles, or all three sided shapes, etc. Or print a picture of a house, identifying which shapes are needed for the windows, door, roof, etc. • Put identical squares (or circles, triangles, etc.) on a washing line with one that is markedly bigger or smaller. Ask the student show you the "big square" • Draw big shapes on the floor / playground or demarcate them with masking tape. Hold up visual prompts and ask the students to "Stand in the square" or "Sit in the triangle". If appropriate, use verbal instead of visual prompts. • Draw big shapes on the playground with chalk. Can the students walk / run / skip / manoeuvre their wheelchair around them? How accurate are they at walking along straight lines, turning corners, following curves? • Print with 3D shapes. What 2D shape do they make on the paper? If you dip a different face in the

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• To demonstrate awareness of the names (word / symbols / sign) of 2D shapes • To use some familiar words / symbols / signs to name and describe 2D shapes • To pick out named 2D shapes from a collection • To use two 2D shapes to make and describe a simple model or pattern	paint, does it make the same shape? • Sort for shape – give the students a selection of plates, bowl, cups and cutlery from the home corner. Ask them to sort them into "round things and long things" • Play with toy cars on a large floor map. Can you make the car go around the roundabout / straight down the road / turn a corner? • Make straight and curved tracks with a train set. Can they make a track that is a circle? An oval? A square? • Look at play food from the home corner. Sort it by shape. Ask the students to make their own food with dough. What shape is it? • Shape Hunt in the classroom or environment – looking for circle shapes or things that have circles on them, etc. • Guess the name of a shape hidden under a cloth or partially hidden by a screen. What shape couldn't it be? • Make a circle, square or triangle shape in groups, either by standing up and holding hands, or by lying down at angles to one another. Record with digital cameras • Use an answer board to respond to questions such as "Is it a square?" • Hide shapes in sand or bubbly water. Feel and guess their name, either verbally or by pointing to identical shapes or symbols of them • Represent shapes with instruments, such as playing a "short spiky" sound three times to represent the three corners on a triangle, or four long, smooth sounds to represent the four sides of a square. Can other students guess which shapes are being represented by sound when played by an adult or one of their peers? (Use visual cues) • Choose instruments which match 2D shapes (e.g. tambourine – circle, woodblock – rectangle, triangle – triangle, etc.). When matching shapes are held up, play your instrument • Cut shapes out of dough with pastry cutters. Bake and make a shape mobile, or match to shape pictures (such as a circular sun and a rectangular book) • Make Roamer / Pip travel in a straight line / turn a corner / go round in a circle. Try to make or imitate these paths on a bicycle or with toy cars. • Shape game: throw dice with symbols of 2D shapes on it and find the shape thrown from a collection • Find shapes on / in the apparatus in PE – ask the students to climb in/on something that is a circle / has straight lines / stand next to a corner – use visual prompts to support students as necessary • Draw circles / squares / straight lines / curved lines etc in drawing packages on the computer. Can they

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	describe them / match them to similar shapes • Make books in the shape of squares, circles and triangles and cut out objects of that shape from catalogues to stick in • Use sticky shapes to copy or create pictures • Make a picture of a body using different 2D shapes to represent each part of the body • Make shape biscuits, using pastry cutters • Make shape biscuits using a knife to cut them into curved and straight shapes • Look at shapes in the environment that tessellate, such as brick walls, tiles, etc. Take rubbings or draw the shapes • Look at shapes in the environment, such as on road signs and signs in shops • Look at a simple picture of a machine. What shapes can the children identify? Can they colour all the squares red, the circles, yellow, etc.? • Have a 2D shape table in the classroom. Ask children to find shapes at school or home to add to it. Have symbol supported labels, and encourage the children to label the items they have found • Fold or cut a square piece of paper along different axis (these could be drawn on) to create triangles, rectangles and a smaller square. • Cut a circle into a spiral and explore how it changes. Can you cut a square or a triangle into a spiral?
• To demonstrate an interest in the different properties of 3D solid • To manipulate 3D shapes • To demonstrate recognition of spheres and cubes • To match 3D solids • To group or sort 3D solids by attributes or properties of shape or size	• Roll tennis balls down a piece of guttering. Compare rolling balls at different gradients and what happens when a cube, cylinder, cone or pyramid is placed in the guttering. Which one travels faster? • Roll a cylinder in a race with a partner • Explore how a tube fits into a circular hole • Draw around 3D shapes. Match the shapes produced to 2D shapes • Hide shapes in dry sand and ask students to explore or describe them. Can they match the shape they are feeling to one they can see? Try a similar activity with a feely bag • Use 3D solids to stamp shapes in damp sand or dough. Can they describe the shapes they have made? • Set challenges with construction toys, such as make a model using all the cuboid bricks • Blow bubbles using different shaped wands (these can easily be made using flexible wire, or some commercial bubbles come with different shaped wands). First use a circular wand and observe and describe the shape of the bubbles produced. Next, try a square, triangle or star shaped wand and predict what shape the bubbles will be. Children could draw the wand and the bubbles, focusing on the shapes of each • Find round shapes in the classroom or from a collection. Find all the food that comes in square packets

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• To show awareness of the names (word / symbols / sign) of 3D shapes • To use some familiar words / symbols / signs to name and describe 3D solids, e.g. "circle" for sphere, "square" for cuboid, etc. • To pick out named 3D shapes from a collection • Use a variety of 3D solids to make and describe a simple model or pattern	• Match lids of different shapes and sizes to the right boxes • Look at play foods. Make some play food from dough. Discuss and describe the shapes. Make balls from dough. Which ones roll the furthest? Why? Make cylinders of different thicknesses from dough, plasticine or clay. Can you make a cube? • Explore rolling balls through cylinders and hoops. Introduce the vocabulary • With building bricks, challenge children to make a tower using only the red bricks. Which shapes will not work for building a tower? Why? • Make a Tower – Use a variety of different reclaimed boxes. Discuss the difficulty of placing large boxes on top of smaller ones • Pairs of Boxes – Can you find any boxes that are the same in this pile? They must be the same shape and size • Play hunt the solid – have two identical 3D solids give one to a student and ask the to find the other which is "hidden somewhere in the classroom (or a smaller space if appropriate) • Try to tessellate real life objects, such as putting all of the stock-cubes into a box, fitting snooker balls into a triangle, dominoes into a box, etc, • Play a game of snooker and identify the different shapes in the game (triangle for racking up the balls, rectangular table, spherical balls) • Say, sign or indicate, which of two cubes, spheres or cylinders, which is larger or pick out all of the cylinders that are bigger than a given one • Use an answer board to respond to questions such as "Is it a cube?" • Sort a selection of 3D solids into those that roll and those that don't roll • Choose a selection of 3D shapes and dip in paint. See what patterns you can make by rolling / sliding the shapes across the paper. Which shapes roll / which shapes slide? Do they make the same shape you can see on them when you print? • Guess the name (or pick out the symbol) of a 3D solid hidden under a light cloth. What couldn't it be? Why? • Use reclaimed materials to make models from3D solids, for example, some sort of machine. Describe the shapes they have used. Discuss how it is easy to glue flat surfaces together, but more difficult to glue curved ones. Discuss which shapes make the best towers • Newspaper balls – Can you make some balls with newspaper and tape. Can you make big ones and small ones? Do they roll? • Make 3D models using reclaimed materials. Explore what happens when you try to glue a cuboid on

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	top of a sphere, or a cylinder on a pyramid • Have a 3D shape table in the classroom. Ask children to find shapes at school or home to add to it. Have symbol supported labels, and encourage the children to label the items they have found • Shape game: throw dice with symbols of 3D shapes on it and find the shape thrown from a collection • Make a posting game by placing one face of a 3D object on card, or the lid of a cardboard box and draw around it. Repeat with other shapes and cut out, with help. Can you post the objects in the right holes? • Put a collection of spheres in order of size • Cut a variety of fruit or vegetables into slices to investigate what the cross section of them is. Predict what shape a slice of orange will be. Can you cut the orange in a different way to produce a different shape? What about a banana?