



# Willow Dene School Scheme of Work

## MATHS: Symmetry

**About this Scheme of Work:** This unit explores Symmetry. Children will be working on developing an understanding of patterns, rhythms and sequences, as well as exploring mirrors and lines of symmetry.

*A main aim for pattern [for children working at the early levels of understanding] could be: to gain a better understanding of the importance of rhythms and patterns in every day life – making more sense of the world around us. It may progress to an understanding of “what comes next” or “what comes last”.*

- Flo Longhorn (paraphrased)

### VOCABULARY:

*Own names, yes, no, more, finished, like, don't like, stop, go, ready*

### SYMMETRY

- Words related to size, such as big, bigger, small, smaller
- Words related to position, such as before, after, middle, between, next
- Words related to pattern, such as pattern, repeating pattern, match, same, different, copy, *colours, shapes*
- Words relating to symmetry, such as line of symmetry, fold, mirror line, reflection, symmetrical

### RESOURCES:

- |                                    |                         |                                                                  |
|------------------------------------|-------------------------|------------------------------------------------------------------|
| • Stethoscopes                     | • Construction toys     | • Silver card, sequins and cardboard tubes to make kaleidoscopes |
| • Mirrors: flat, flexible, hinged  | • Stacking/nesting toys | • Instruments to make musical patterns                           |
| • Colour and shape cards and fans  | • Wrapping papers       | • Tessellating shapes                                            |
| • Textured and patterned wallpaper | • Toy farm and animals  | • Pattern Blocks                                                 |
| • Beads and buttons                | • Toy cars and lorries  |                                                                  |
| • Printing materials               | • Icing and chocolates  |                                                                  |

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	KEY
<ul style="list-style-type: none"> <li>• Show awareness of differences in shape, size or colour</li> <li>• Learn the sign / symbol / word for <b>pattern</b></li> <li>• Join in with the creation and continuation of simple mathematical patterns such as stripes or zigzags</li> <li>• Match, with help, objects and pictures</li> <li>• Demonstrate an understanding of the concept of a simple repeating mathematical pattern</li> <li>• Copy simple mathematical patterns or sequences</li> <li>• Recognise simple mathematical patterns</li> <li>• Talk about simple repeating patterns and attempt to recreate them</li> </ul>	<ul style="list-style-type: none"> <li>• Make simple patterns, such as a series of vertical stripes, or a row of circles. Can the children copy or continue these?</li> <li>• Make a pattern with feet by dipping feet in paint and walk along a piece of wall paper. Can the children make different pathways? How do the patterns change if they run, jump, skip?</li> <li>• Make a tactile pattern by supplying the children with a range of tactile materials, e.g. velvet, bubble wrap, sandpaper, polystyrene tiles. Ask them to select one, then draw around their hands and cut out the shape. Make a tactile trail of hands. Blindfold the children and encourage them to explore the trail.</li> <li>• Wrapping paper – Look at patterned wrapping paper with stripes, zigzags, dots, etc. and ask children to choose their favourite. They could cut and stick their own design from the paper</li> <li>• Listen to different pieces of music on Windows Media Player on the SMART Board. Change the “visualisations” and observe the patterns. Give the children some pens / paint / crayons and ask them to draw their own pattern to go with the music</li> <li>• Explore liquid patterns, by joining two OHP transparencies on three sides with tape. Ask children to choose a liquid to put inside the sheets (e.g. oil, tomato ketchup, marbling ink, etc.) Seal up the fourth side of the transparencies and place it on an OHP. Ask the children to press the transparencies to see what effect it has on the liquid between the two sheets. Try mixing different liquids to see what happens</li> <li>• Explore body patterns – make patterns with children lined up, such as boy / girl; high / low; lying /sitting; etc. Take photos with digital camera</li> <li>• Explore instrument patterns – play a rhythm on a drum, such as 1, 2, 3 / pause etc. Can children join in / copy / continue the pattern? Try with two instruments, such as bells / maracas etc.</li> </ul>		

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	KEY
<ul style="list-style-type: none"> <li>Talk about, describe, recognise, recreate and continue simple mathematical patterns</li> </ul>	<ul style="list-style-type: none"> <li>Make wax rubbings of textured wallpapers. Can the children describe the patterns, shapes, etc?</li> <li>Explore body rhythm patterns – join in or copy two-part body rhythms, such as clap hands / slap knees, stamp feet / click tongues, hum / rub tummy etc.</li> <li>Explore body movements – make movement patterns with body such as arms up / arms down, tall body / wide body, curl up / stretch up, hop / jump. Initially the teacher can demonstrate these patterns for children to copy, then ask children to lead</li> <li>Make a two-part shape or colour pattern on a washing line, such as circle / square or blue / yellow. Continue the pattern, then ask children to indicate what comes next on a colour or shape fan</li> <li>Make a two-part pattern with everyday objects, such as plate / spoon, or cup / jug etc. Can children copy / continue the pattern?</li> <li>Match objects or pictures to copy any a simple pattern, such as cat / dog / cat / dog / etc. Use vocabulary “what’s next?” / “is it the same?” etc.</li> <li>Investigate rotating or flipping a piece of inset or jigsaw puzzle to make it fit</li> <li>Put a mirror on the table, give the children some wooden building bricks and ask them to build a tower on top of the mirror</li> <li>Join two plastic mirrors with tape, so they are hinged. Give the children a variety of objects to explore in the mirrors. c Explore what happens to the reflections of the objects</li> <li>Look through a kaleidoscope. Change the patterns by turning it</li> <li>Look at patterns in water – use a footspa and look at the ripples caused on the surface at different speeds. Drop objects into water and look at patterns caused when they are dropped from a greater or lesser height</li> <li>Thread beads to create two part patterns, focusing on either shape or colour. Can children copy / continue / describe the pattern? Give children a limited selection of beads to simplify the</li> </ul>		

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	KEY
	<p>task (e.g. red and blue beads or sphere and cube beads)</p> <ul style="list-style-type: none"> <li>• Use a range of printing materials such as sponges, cotton reels, potatoes, bricks, to create a two part pattern based on shape or colour.</li> <li>• Look at patterned wrapping or wall paper with stripes, zigzags, dots, etc. and ask children to design their own</li> <li>• Give children a selection of two colours of <i>Duplo</i> or <i>Lego</i> and ask them to build a tower with a pattern. Start them off if appropriate. Ask pairs of children to each make a tower. Ask them to swap with their partner. Can they copy their partner's tower?</li> <li>• Put objects in order of size, such as Russian dolls, nesting boxes, a set of towers, etc.</li> <li>• Stamp a pattern into damp sand using a selection of objects, such as blocks, shells, sticks, rakes, etc.</li> <li>• Go on a pattern hunt around school, looking for patterns in the building or in nature, such as bricks, tree bark, wire reinforced glass, etc. Make rubbings of them</li> <li>• Use a variety of media (crayons, pens, pencils, paint, etc.) to draw two-part patterns based on colour or shape</li> <li>• Make farm patterns – line up the animals to go into the barn, such as pig / cow, horse / sheep, etc.</li> <li>• Make car patterns – line up cars to go into the garage, such as lorry / car, red car / yellow car, etc.</li> <li>• Make icing patterns – use squeeze tubes of icing and Smarties, Buttons, etc. to decorate cakes or biscuits with line patterns</li> <li>• Look at patterns in a mirror and describe them. Can children make a linear pattern longer / shorter?</li> <li>• Draw a picture of a worm and ask the children to make it longer / shorter using a mirror. Similarly, ask them to fix a broken plate, make a puddle larger, etc.</li> <li>• Use a mirror to apply face paints. Point to and describe what</li> </ul>		

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	EVALUATION	KEY
	<p>colours they have used for eyes, cheeks, etc</p> <ul style="list-style-type: none"> <li>• Stand opposite a partner and mirror their actions. Encourage children to think about which arm, etc. to move</li> <li>• Do a butterfly painting – paint one side of a piece of paper then fold in half. Unfold. Ask the children to describe what they see</li> <li>• Match two halves of a (symmetrical) picture together. Ask children to explain how they knew which way up / round the pictures went together</li> <li>• Use RM Colour Magic on the computer. Ask children to draw a picture, then explore the symmetry buttons – both two way and four way symmetry. Print some examples of children’s work</li> <li>• Make a kaleidoscope by using three small strips of silver card and joining them (reflective sides in) to form a prism. Tape a piece of greaseproof paper to one end of the prism. Put a few sequins or beads inside the prism, then tape cling film or transparent film over the other end of the prism. Place the prism inside a kitchen roll tube. Hold it up to the light and look through it. What happens when you turn it around?</li> <li>• Use this website:  <a href="http://www.techniquet.org/exhibits/sketch.php">http://www.techniquet.org/exhibits/sketch.php</a>  to explore horizontal, vertical and diagonal lines of symmetry, as well as four way symmetry</li> <li>• Fold a piece of paper in half. Place a simple template, such as half a heart, a semi circle or half a star on the fold and draw around it. Cut out the shape. Open out the paper and colour the shape</li> </ul>		