

2 D space (including angles) 2

| Outcome | Teaching and Learning Activities | Notes/ Future Directions/Evaluation | Language / Date |
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| <p>A student:</p> <ul style="list-style-type: none"> › describes mathematical situations and methods using everyday and some mathematical language, actions, materials, diagrams and symbols MA1-1WM › manipulates, sorts, represents, describes and explores two-dimensional shapes, including quadrilaterals, pentagons, hexagons and octagons MA1-15MG <p>Syllabus Reference: Hardcopy: 114 Digital: 119</p> | | <p>Background information</p> <p>In Stage 1, students need to have experiences involving directions and turning. Discussions about what represents a 'full-turn', a 'half-turn' and a 'quarter-turn' will be necessary. Relating this information to students physically may be helpful, eg by playing games such as 'Simon Says' with Simon saying to make turns.</p> <p>Digital technologies such as computer drawing tools may use the terms 'move', 'rotate' and 'flip horizontal', or various other terms, to describe transformations. The icons for these functions may assist students in locating the required transformations.</p> | <ul style="list-style-type: none"> • shape, • two-dimensional • shape (2D shape), • triangle, • quadrilateral, • parallelogram, • rectangle, • rhombus, • square, • trapezium, • kite, • pentagon, • hexagon, • octagon, • line (axis) of symmetry, • reflect (flip), • translate (slide), • rotate (turn), • tessellate, • clockwise, • anti-clockwise, • half-turn, • quarter-turn, • three quarter-turn. |

| Activities | | |
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| <p>Explicit Mathematical Teaching</p> <p>Manipulation of a variety of real objects and shapes is crucial to the development of appropriate levels of imagery, language and representation. Skills of visualising three-dimensional objects and two-dimensional shapes are developing at this Stage and must be fostered through practical activities and communication. It is important for students to experience a broad range and variety of shapes in order to develop flexible mental images.</p> <p>Students need to be able to recognise shapes presented in different orientations. In addition, they should have experiences identifying both regular and irregular shapes. Regular shapes have all sides equal.</p> <p>A shape is said to have symmetry if both parts match when it is folded along a line of symmetry. Each part is the mirror image of the other.</p> <p>Explain meaning of <u>tessellate</u> Discuss patterns of tiles in bathrooms/hallways at home. Which tiles have no gaps? Why? <u>Computer</u> Use Drawing tool (in Word) to make a shape. Copy and paste (duplicate) to see if it tessellates.</p> <p>Explain meaning of symmetrical, symmetry. Investigate which 2D shapes have one/more than 1 line of symmetry Fold paper - circles (infinite) - squares (4) - rectangles (2) - triangles (equilateral, isosceles, scalene)</p> | | |
| <p>Flip, Slide and Turn - Sample Units of Work pg 79</p> <p>In pairs, students make a design by placing a pattern block on paper, tracing around it and then flipping, sliding or turning the block to a new position and repeating the process. Possible questions include:</p> | | |

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| <ul style="list-style-type: none"> ■ is your pattern different when you flip, slide or turn? ■ which patterns are symmetrical? Why? ■ how did you make your pattern? <p>Students combine the movements of flipping, sliding and turning in a variety of ways to create different designs. Students describe the designs they have created and explain how they were made using the language of 'flip', 'slide' and 'turn'.</p> | | |
| <p>Shape Symmetry Sample Units of Work pg 77</p> <p>Students find shapes that have a line of symmetry by folding the shapes in half. In pairs, they are given a collection of regular and irregular shapes that could include squares, rectangles, triangles, trapeziums, rhombuses, hexagons and circles. Possible questions include:</p> <ul style="list-style-type: none"> ■ which shapes can be folded in half? ■ which shapes can be folded in half in a different way? ■ which shapes do not have a line of symmetry? <p>Students glue their shapes onto paper and record their findings.</p> | | |
| <p>Flags - Sample Units of Work pg 78</p> <p>The teacher provides a number of flags for students to investigate symmetry. In pairs, students choose flags from those displayed, determine which are symmetrical, and give reasons for their choice. In pairs, students design their own symmetrical flags and display these for others to determine the lines of symmetry.</p> | | |
| <p>Tessellation</p> <p>In small groups, students select a shape (eg square, circle, triangle, hexagon, rhombus, trapezium) to investigate whether it tessellates. Students trace around the shape and slide it to a new position attempting to cover the surface without leaving gaps. Students share their drawings. They group the shapes according to those that tessellate and those that do not</p> | | |