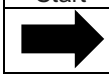
LEVEL: Year 3/4	CONTENT: Measurement and Geometry	FOCUS: Transformations
In the Classroom		
PURPOSE	• Identify and describe shape transformations • Create a pattern made using shape transformations • Copy a pattern made using shape transformations • Continue a pattern made using shape transformations • Explain possible variation in results • Create a unique shape and use this to create a design • Recognise and describe symmetry in patterns and objects	
ENTRY TASK	**Shape Transformations** Ask all students to draw an arrow facing upwards – then provide a series of instructions to redraw the arrow, for example, flip, slide, turn, etc. Students must then share and describe their patterns made.	
EXPLICIT TEACHING & LEARNING	**Making Patterns** Students work with a partner. Both students choose a shape and record a series of 6 shape transformations. Using a barrier, students take turns to describe the steps to a partner, who must redraw the shape in the correct position. Discuss the variation in results and the importance of using language accurately. **Challenge** Use a post-it note to create own shape and a design which can be described.	
DISCUSSION/KEY QUESTIONS	• Can you describe and model a flip, slide and turn? • What is the difference between clockwise and anticlockwise? • How else can we describe shape turns? Can we use degrees or clock terms? • Why might there be variation in results? • How can we make our descriptions more accurate? • What is symmetry? Where do we see it? How can we describe it?	
DELIBERATIVE PRACTICE	The first activity is used to see if students have any misconceptions regarding the use of different shape transformation terms. Unless stated, we turn shapes clockwise and flip shapes left to right.	
REFLECTION	Encourage students to create a 6-step pattern using an object and describe this using different positional language and transformation terms. Focus on why there can be a variation in results, how can we aim to increase our accuracy?	
RESOURCES	Pattern blocks or other shape materials Post-it notes, scissors, tape and glue	
Curriculum Connections		
CONTENT	**VICTORIAN CURRICULUM F-10 – Measurement and Geometry** **Year 3 – Location and Transformation** Identify symmetry in the environment (VCMMG144) **Elaborations:** identifying symmetry in Aboriginal rock carvings or art; identifying symmetry in the natural and built environment Identify and describe slides and turns found in the natural and built environment (VCMMG145) **Elaborations:** recognising and representing slides and turn used in brickwork around the school; recognising and representing slides and turn used in sporting activities **Year 4 – Location and Transformation** Create symmetrical patterns, pictures and shapes with and without digital technologies (VCMMG173) **Elaborations:** using stimulus materials such as the motifs in Central Asian textiles, Tibetan artefacts, Indian lotus designs and symmetry in Yolngu or Central and Western Desert art **Year 5 – Location and Transformation** Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries (VCMMG200)	

	Elaborations: identifying and describing the line and rotational symmetry of a range of two-dimensional shapes, by manually cutting, folding and turning shapes and by using digital technologies; identifying the effects of transformations by manually flipping, sliding and turning two-dimensional shapes and by using digital technologies
WHAT CAME BEFORE	Students may be familiar with some shape terms and terms to describe position and movement. It will be important to use these terms together to accurately describe shape transformations and the patterns created.
WHAT COMES NEXT	Accurately describing flips, slides and turns is a precursor to being able to create and describe patterns involving a series of shapes, including tessellating patterns.
VOCABULARY	Flip, slide, turn, reflect, translate, rotate, degrees, half, quarter, horizontal flip (flip across or left to right), vertical flip (flip up/down), pancake, sliding door, turning a dial, symmetry, tessellations, clockwise, anticlockwise
MISCONCEPTIONS	Although students may be able to model the correct movement, the issue often comes in when using the correct language to describe the transformation. Some movements can be described using different terms, so it is important to emphasise the accurate use of language.
WHAT PROFICIENCIES ARE TO BE UTILISED? **Understanding** **Fluency** **Problem Solving** **Reasoning** **Communicating (NSW)** **Justifying (NSW)**	**Year 3 (Australian Curriculum)** **Understanding** includes connecting number representations with number sequences, partitioning and combining numbers flexibly, representing unit fractions, using appropriate language to communicate times, and identifying environmental symmetry **Fluency** includes recalling multiplication facts, using familiar metric units to order and compare objects, identifying and describing outcomes of chance experiments, interpreting maps and communicating positions **Problem-solving** includes formulating and modelling authentic situations involving planning methods of data collection and representation, making models of three-dimensional objects and using number properties to continue number patterns **Reasoning** includes using generalising from number properties and results of calculations, comparing angles and creating and interpreting variations in the results of data collections and data displays.
ASSESSMENT	**Exit Ticket** Draw the pattern created by this arrow Start | Flip | Slide | Turn | Turn | Slide | Flip  | | | | | |