

LEVEL: Kindergarten	CONTENT: Number & Algebra	FOCUS: Pattern
In the Classroom		
PURPOSE	<ul style="list-style-type: none"> • Use body, shapes and objects to make repeating patterns • Describe patterns using everyday language • Copy and continue patterns • Use ordinal numbers to identify elements in the pattern, e.g. the 3rd counter is blue • Use location words and shape language to describe features of the pattern, e.g. my pattern is made from squares, it goes red, blue, red, blue, etc. 	
WARM UP	<p>Watch the Go Noodle video – Banana, banana, meatball. Have students stand up and join in with the patterns on the video – pause the video and ask students to name and demonstrate the pattern.</p>	
INTRODUCTION	<p>Brief introduction to Good Mathematicians – make a list and place on the board, include teamwork, asking questions, sharing ideas, recording ideas, explaining thinking, persistence, checking work and learning from mistakes.</p>	
EXPLICIT TEACHING & LEARNING	<p>Making Patterns Provide students with a range of materials and encourage them to make and explain repeating patterns. Initially, the focus is on using everyday language to describe the pattern and gradually introduce students to more formal mathematical terms, including location words, shapes and ordinal numbers.</p> <p>Challenge Play a barrier style game where both students are given the same initial materials. Students sit between a divider. Student 1 makes a pattern and must describe the pattern to student 2 who then tries to make the pattern on his side of the barrier before checking if both patterns are the same and reflecting on why/why not.</p>	
DISCUSSION/KEY QUESTIONS	<ul style="list-style-type: none"> • Can you describe your pattern? • What did you use to create your pattern? • What is first object in your pattern? Third? Fifth? • What comes next in the pattern? • What comes before in the pattern? • What is the part of the pattern that repeats? • How could we record these patterns in our books? • Instead of using colours, how else could we record the patterns in our books? 	
DELIBERATIVE PRACTICE	<p>The focus of this activity is to discover if students can make, copy, continue and explain repeating patterns. Often students will only be asked to continue patterns to the right, but ensure you ask students to continue patterns to the left. Like the number sequence a pattern can extend in both directions.</p>	
REFLECTION	<p>Choose one student's pattern and place on the board – draw, re-create or take a photo. Have students identify the pattern, name the part that repeats, continue the pattern to the left and to the right and point to various ordinal numbers. Also reflect as a class on students who were a Good Mathematician and why – have students nominate one another. Remind students of list created at the beginning of the lesson.</p>	
RESOURCES	<p>Materials to make patterns (counters, shapes, coloured bears, etc.) Banana Banana Meatball - Blazer Fresh GoNoodle YouTube video https://www.youtube.com/watch?v=BQ9q4U2P3ig</p>	

Curriculum Connections	
CONTENT	<p>NSW Syllabus Mathematics K-10 – Early Stage 1 Patterns & Algebra Sort and classify familiar objects and explain the basis for these classifications (ACMNA005)</p> <ul style="list-style-type: none"> • sort and classify a group of familiar objects into smaller groups • recognise that a group of objects can be sorted and classified in different ways • explain the basis for their classification of objects (Communicating, Reasoning) <p>Copy, continue and create patterns with objects and drawings</p> <ul style="list-style-type: none"> • recognise, copy and continue repeating patterns using sounds and/or actions • recognise, copy, continue and create repeating patterns using shapes, objects or pictures, eg $\blacklozenge, \square, \blacklozenge, \square, \blacklozenge, \square, \blacklozenge, \square, \dots$ • create or continue a repeating pattern using simple computer graphics (Problem Solving) • recognise when an error occurs in a pattern and explain what is wrong (Communicating, Reasoning) • describe a repeating pattern made from shapes by referring to its distinguishing features, eg 'I have made my pattern from squares. The colours repeat. They go red, blue, red, blue, ...' <p>Whole Numbers Establish understanding of the language and processes of counting by naming numbers in sequences, initially to and from 20, moving from any starting point (ACMNA001)</p> <ul style="list-style-type: none"> • read and use the ordinal names to at least 'tenth'
WHAT CAME BEFORE	As the song in the introduction suggests, patterns are everywhere. Students will be familiar with patterns but may need assistance describing their pattern to others using terms that everyone can understand.
WHAT COMES NEXT	Students will move from patterns with objects to patterns on the counting chart and skip counting patterns. Ensuring students identify what comes after and before in their pattern will help students develop a linear understanding of patterns (and later the number sequence). Patterns (and numbers) can go on forever in both directions.
VOCABULARY	Repeating pattern, growing pattern, next, before, after, ordinal numbers, first, second, last, copy, continue, create, explain, unit of repeat, objects, features, shape words, etc.
MISCONCEPTIONS	When shown a pattern some students may only be able to copy the part of the pattern that is seen as they are yet to grasp the concept of repeating. Ensure that students are also shown patterns made with more than two elements. A repeating pattern has a constant unit of repeat, be that either red, blue, red blue, etc. or a number pattern like 2, 4, 6, 8. Despite the numbers getting larger the difference between the numbers is the same each time so the pattern is repeating. A growing pattern the gap between the numbers would need to be increasing, say add 1, then add 2, etc. A student could create a growing pattern if each time he was using additional objects, say red, blue, red, blue, blue, red, blue, blue, blue.
WHAT PROFICIENCIES ARE TO BE UTILISED? Understanding Fluency Problem Solving Reasoning Communicating (NSW) Justifying (NSW)	<p>Foundation (Australian Curriculum) Understanding includes connecting names, numerals and quantities Fluency includes readily counting numbers in sequences, continuing patterns and comparing the lengths of objects Problem-solving includes using materials to model authentic problems, sorting objects, using familiar counting sequences to solve unfamiliar problems and discussing the reasonableness of the answer Reasoning includes explaining comparisons of quantities, creating patterns and explaining processes for indirect comparison of length.</p> <p>NSW Syllabus Mathematics K-10 – Early Stage 1 Outcomes</p> <ul style="list-style-type: none"> • Describes mathematical situations using everyday language, actions, materials and informal recordings • Uses objects, actions, technology and/or trial and error to explore mathematical problems • Uses concrete materials and/or pictorial representations to support conclusions • Recognises, describes and continues repeating patterns
ASSESSMENT	Ask students to draw the pattern they have created into their books and/or take photos of the students' patterns and record their description.