

YuMi Deadly Maths

Year 1 Teacher Resource: **NA – Pattern pursuit**

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT



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ACKNOWLEDGEMENT

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Year 1 Number and Algebra

Pattern pursuit

Learning goal	Students will identify, describe and create repeating patterns.
Content description	Number and Algebra – Patterns and algebra <ul style="list-style-type: none">Investigate and describe number patterns formed by skip counting and patterns with objects (ACMNA018)
Big idea	Algebra – repeating patterns
Resources	Various manipulatives for pattern making, e.g. beads, shapes, counters, different pastas; Maths Mat, coloured cards

Reality

Local knowledge Pattern hunt: Locate and identify patterns in the local environment and classroom (visual, aural, kinaesthetic). Relate to the pattern of the times and activities of each week day – breakfast, school, lunch, home, favourite TV show, dinner, bed; patterns in cultural music and dance.

Prior experience Check that students can match objects and see similarities and differences.

Kinaesthetic Repeat each pattern several times so that students have actual experience of a repeating pattern. Describe the pattern each time so students know what to do.

Make visual patterns – two lines with half class in each line:

- 1 apple / 1 orange; distribute fruit alternating between apples and oranges to half the class. All say *apple, orange, apple orange* ... repeat a few times. Have all students close their eyes, take one piece of fruit. Open eyes. *What is the missing piece? Apple or orange?* Repeat.
- 1 banana / 1 pear with next line of students as above.
- If we used letters instead of fruit, what would the pattern be? a, b, a, b, a, b ... Say the pattern.* Repeat several times.

Make kinaesthetic patterns:

- all students – both hands on head / both hands on knees
- dance steps – heel and toe, heel and toe, walk 2, 3, 4
- half the students in a line – 1 hop / 1 jump
- other half – walk 1 step forward / walk 1 step sideways.

Make aural patterns:

- drum beats
- with hands – slow clap, clap / fast clap, clap, clap (used in many classrooms as a signal to stop and listen)
- with feet – fast stomp, stomp, stomp / slow stomp, stomp.

Model some non-patterns. Discuss the difference.

Abstraction

Body Maths Mat: Make *a, b* patterns with cards of different colours.

Groups of six to eight students: One group makes a visual pattern, other groups make aural or kinaesthetic patterns. Demonstrate these to the class describing why they are patterns, not non-patterns.

Hand	Students use manipulatives to create their own pattern that they then describe to the class and justify their pattern by identifying and describing the repeating element.
Mind	Students visualise patterns that the teacher describes or that students suggest.
Creativity	Students make their own patterns using their choice of manipulatives/drawing. Describe their patterns and explain why they are patterns.

Mathematics

Language/symbols	pattern, non-pattern, same, different, describe, copy, create, repeating, rule, element, continue, explain, colour, shape, size, direction, loud, soft, fast, slow, linear, nonlinear, count, ones, number sequence, number pattern, next, before, after, number names to 100
Practice	<ol style="list-style-type: none"> Distribute bags containing three different types of pasta (12–15 of each type). Ask students to make an <i>a, b</i> pattern with the pasta. Make an <i>abb, abb</i> pattern. Use virtual examples for students to: <ol style="list-style-type: none"> continue patterns in both directions identify patterns and non-patterns justify their reasoning identify missing elements of a pattern. Students make, describe and compare their patterns with partners/group identifying the pattern used. Act out some patterns.
Connections	Compare the twos, fives, tens patterns. Teacher may reinforce this with skip counting, e.g. <i>2, clap, 6, clap, 10, clap ...</i>

Reflection

Validation	Students look for, find and describe patterns they see around them, e.g. find the pattern in objects in the classroom, in their day's routine, in the days of the week.
Application/problems	Provide applications of repeating patterns using alphabet letters, animals, toys, and so on and ask students to find, continue and justify the patterns.
Extension	<p>Flexibility. Students are able to identify, make, continue and justify patterns from any given starting point.</p> <p>Reversing. Students are fluent in going from making a pattern to describing their pattern \leftrightarrow hearing a pattern described and making it; listening to a story pattern and acting it out \leftrightarrow seeing it acted out and then telling the story.</p> <p>Generalising. <i>Patterns keep on repeating the same elements in the same order.</i></p> <p>Changing parameters. Provide examples that increase the complexity of elements in the part that repeats.</p>

Teacher's notes

- Start with only one pattern element, e.g. shape or colour or size, and extend to two elements as confidence increases. Always ask, *What is the part that is repeating? What part are we saying/doing over and over again?*
- Remember the sequence: Allow students to copy, continue, complete and construct patterns. Always identify the repeating part.
- Give students many activities that reverse: from pattern to identifying the repeat; and from given repeat to making the pattern.

- Students need to be taught the skill of visualising: closing their eyes and seeing pictures in their minds, making mental images; e.g. show a picture of a kookaburra, students look at it, remove the picture, students then close their eyes and see the picture in their mind; then make a mental picture of a different bird.
- Suggestions in Local Knowledge are only a guide. It is very important that examples in Reality are taken from the local environment that have significance to the local culture and come from the students' experience of their local environment.
- Useful websites for resources: www.rrr.edu.au; <https://www.qcaa.qld.edu.au/3035.html>
- Explicit teaching that **aligns with students' understanding** is part of every section of the RAMR cycle and has particular emphasis in the Mathematics section. The RAMR cycle is not always linear but may necessitate revisiting the previous stage/s at any given point.
- Reflection on the concept may happen at any stage of the RAMR cycle to reinforce the concept being taught. Validation, Application, and the last two parts of Extension should not be undertaken until students have mastered the mathematical concept as students need the foundation in order to be able to validate, apply, generalise and change parameters.