YuMi Deadly Maths

Year 2 Teacher Resource:

NA – Patterns

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT

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ACKNOWLEDGEMENT

We acknowledge the traditional owners and custodians of the lands in which the mathematics ideas for this resource were developed, refined and presented in professional development sessions.

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Prepared by the YuMi Deadly Centre
Queensland University of Technology
Kelvin Grove, Queensland, 4059

ydc.qut.edu.au

Year 2 Number and Algebra

Patterns

Learning goal	Students will recall the fives and tens counting sequence and use skip counting by fives and tens to count a collection.
Content description	Number and Algebra – Number and place value • Investigate number sequences, initially those increasing and decreasing by twos, threes, fives and ten from any starting point, then moving to other sequences. (ACMNA026) Number and Algebra – Patterns and algebra • Describe patterns with numbers and identify missing elements (ACMNA035)
Big idea	Number – counting; Algebra – patterns
Resources	Maths Mat, coloured pencils, blocks, calculators, bead strings, counters, 99 board sheets, clipboard/ paper/pencil, number track expanders, missing 5/10 sheets

Reality

Local knowledge	Discuss applications in the local environment that have connection to the fives and tens counting sequence, e.g. counting animals in the bush using hands, counting the number of students in the class/school.
Prior experience	*How could we sort and count all the coloured pencils in the class box?* [Put the different colours into groups of five/ten and then count in fives/tens to get the total.] Repeat using blocks.
Kinaesthetic	Maths Mat: One student stands at zero and skip counts forwards/backwards in tens from zero to 100. Repeat the process starting from any number, e.g. forwards from 7, 17, 27 ... 97; 29, 39, 49 ... 99; backwards from 84, 74, 64 ... 4. All students count aloud as one student does the skip counting on the Maths Mat. Repeat process skip counting forwards and backwards in fives, initially from 5 and then from different starting points, e.g. 3, 8, 13, 18, 23, 28 ... 98.

Abstraction

Body	Students in groups of five show various numbers using their bodies, e.g. Put 65 into the circle and count in fives – any combination of fingers and toes (10 hands and 3 feet, or 9 hands and 4 feet, or …). *Count in fives to make sure you have 65. How did this group make 65?* Calculator: Enter 0 + 5 = = = = and call out numbers each time. Put 30 into the circle and count in tens (both hands from three of the students, or two students with both hands and one student with both feet in the circle, or …). *Count the tens to make 30. How did this group make 30?* Calculator: Enter 0 + 10 = = = = and call out numbers each time.
Hand	Students use the bead strings to count in tens. *Show 43 on the bead strings and count them out, 10, 20, 30, 40, 41, 42, 43.* Students colour the tens and fives counting pattern on two 99 board sheets starting from 0/5 respectively. Discuss and compare the patterns on the two sheets. Give students a 99 board sheet and have them put a counter on every lot of five and another counter on the tens. Have them count firstly in fives then in tens.
Mind	Students visualise objects in tens and fives seeing tens using two hands and fives using one hand.
Creativity	Students create patterns using their own design, e.g. one hand, five fingers, two feet, ten toes.

Mathematics

Language/ symbols

counting, skip counting, sequence, collection, object, numeral, name, zero, one hundred, missing elements

Practice

1. Oral class practice in counting forwards/backwards in tens/fives.
2. Use paper 100 number track expanders where even tens are coloured, e.g. green, and each set of ten folded behind the previous set to give practice for counting forwards/ backwards in tens. Repeat with another paper 100 track expander where multiples of five are coloured in a different colour for practice in counting forwards/backwards in fives. Give further practice with bead strings.
3. Play "Buzz": Each student has a 99 board sheet. *Walk the 99 board with your fingers saying each number except where it is a multiple (group) of 10 where you say "Buzz".* Repeat for the fives counting sequence.
4. Calculator: Start at any number and enter, e.g. 33 + 5, = = = to get the pattern for counting in fives (33, 38, 43, 48, 53, 58 …). Repeat with tens, e.g. 18 + 10 = = = .
5. Sheets to identify missing elements in familiar five and ten counting sequences.

Connections

Connect to counting in twos, threes, fours.

Reflection

Validation

Students check in their world where they see jumps of five and ten, e.g. metre ruler and fives at the halfway mark in each ten on the ruler; measuring jugs; money.

Application/ problems

Provide applications and problems for students to apply to different real-world contexts independently; e.g. count the number of jelly beans in the jar.

Extension

Flexibility. Students are able to use the tens and fives counting sequence in many different contexts and count past 100. Also count in hundreds and thousands.

Reversing. Count in tens or fives to a given number → start at a given number and work backwards in tens or fives. Give a pattern, e.g. 37, 47, 57, 67, and students identify the pattern [counting in tens from 37 to 67] → make a tens pattern starting from 37. Repeat for the fives from any given number, 363, 368, 373, 378, 383, 388 ….

Generalising.

- Counting forwards/backwards in tens increases/decreases the tens by one more/ less ten while the ones remain the same – only the digit in the tens changes.
- The pattern for counting in even tens always has zero in the ones place.
- The pattern for counting in fives swaps from five to ten in each ten (decade), increasing/decreasing by one ten more/less when counting forwards/backwards in fives.

Changing parameters. Use unfamiliar grids and contexts to show the fives and tens sequences, e.g. number lines.

Teacher's notes

- Ensure students understand and are fluent in the tens counting sequence before proceeding to the fives counting sequence. Stress the counting sequences help us to count large numbers easily so that we trust the tens we have counted in the collection; relate counting to quantity where the **last number counted** tells us the **total**.
- 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.