Number Patterns 2

2.3.7

Introduction
Students will copy, continue, create and describe patterns with numbers.

Resources
- Double sided counters
- 1 – 100 Hundreds Board (A3)
- Number Pattern Base Board
- Calculator
- Whiteboard Markers

Time / Classroom Organisation
Each section of this activity may be introduced in a small group as a 20 minute focused teaching and learning event. Students will need many opportunities to recognise, describe and produce patterns.

Australian Curriculum---Year Two
Describe patterns with numbers and identify missing elements (ACMNA035)
**Proficiency Strand:**
*Understanding* – connecting number calculations with counting sequences

Activity Process--- Explore Patterns on Hundreds board.

1. Ask students to make a yellow, yellow, red pattern on the 1---100 hundreds board.

2. Remove all the red counters, revealing skip counting in threes.

3. Discuss the patterns observed, for example: *diagonal patterns; the digits add up to 3, 6 or 9.*
4. Discuss the **rule** that has been used to create the number pattern – **add 3**.
5. Repeat for skip counting in 2s and 4s; 5s – observing the pattern of the last digits; Repeat for 10s observing the pattern created – *what is changing? (*the first digit*). What is staying the same?(*the last digit*)*
6. Describe the **rule** for each of these number patterns *i.e. +2; +5; +10.*
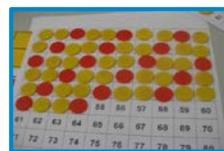
Activity Process---Create a Number Pattern

1. Discuss and identify the rule, for example: *add 3 (+3)*
2. Create the patterns using counters.
3. Students write the rule and starting number on the *Number Pattern base board*, for example: *add 3 (+3)*; *start with 3;* and copy the number pattern on to the *Number Pattern base board* e.g. 3,6,9,12.

4. Students use constant function on calculator *(+3=)* to continue the number pa5ern.
5. Continue writing the number sequence on the *Number pattern base board.*
6. Discuss the completed pattern, for example: *numbers finish with 3,6,9; 2,5,8; 1,4,7; 0 and then starts again.*

7. Repeat the above sequence with the rule: add 2, starting with 5.
8. Repeat the above sequence with the rule: add 10 starting with 4.
9. Repeat the above sequence with the rule: take away 2 starting with 20.
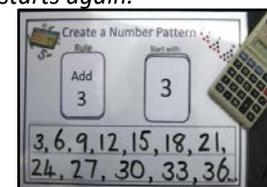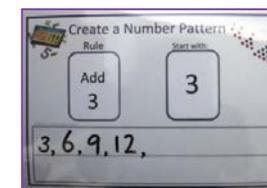
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Variations & Extensions

1. Missing Numbers

Resources: Number Pattern Base Board
and Whiteboard markers

Ask students to select a starting number and give them a counting rule to follow. Ask students to complete the board. Ask the students to erase 4 numbers from their counting pattern and swap their board with another child. Ask the students to then fill in the missing numbers on the board they have just been given.
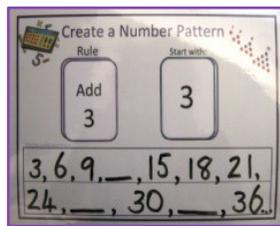
2. Skip It

Resources: Pens and paper

Ask students to create a counting pattern that includes the number 5. Ask a friend to recognise and continue the pattern. Collate the patterns as a class and create a Class Top 10 list of number patterns. Repeat with other numbers such as 12, 20, 18, 70.
Source: A Hillbrick,2005. *Tuning in with Task Cards*. Curriculum Corporation: Carlton. P82

3. What If?

Resources: Pack of cards, pen and paper

Ask students to turn over a playing card. Ask students to start at that number and then continue to count on in 2's, 3's. 5's or 10's.
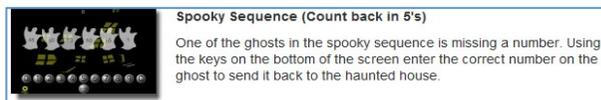

11   13   15   17

Source: A Hillbrick,2005. *Tuning in with Task Cards.* Curriculum Corporation: Carlton. P18

Digital Resources

http://www.sheppardsoftware.com/mathgames/earlymath/BalloonPopPatterns.htm

http://www.ideal---resources.com.au

Contexts for Learning

Play:

Dot to Dots: Provide students with a variety of dot to dots to complete. Include counting in 2s, 3s, 5s and 10s.

Investigation:

http://www.mathwire.com/algebra/growingpatterns.html
Mathswire website provides growing patterns as introduction to algebraic principles. Students should draw and/or describe the next couple of stages in the pattern and create an input/output table to describe the relationship between the stage and the number of blocks used. Students should be challenged to write a rule in words and more capable students should be challenged to write a general mathematical rule that would calculate the number of blocks needed for any given stage.

Real life experience:

Dance: Teach the students a dance that contains a repeated pattern of steps.

Routines and Transitions:

Counting: Practice counting around the class in 2s, 3s, 5s and 10s.
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Assessment

Students complete a number pattern on the *Number Pattern Base Board* – given a rule and a starting number.
- Students identify the rule – given a completed number pattern.
- Students identify missing elements of a number pattern – given the rule and missing numbers on the pattern.

Achievement Standard: identify the missing element in a number sequence

Background Reading

Within a mathematical context, to describe a number pattern means to provide an unambiguous rule or relationship that produces it. Students should be able to follow rules provided by others, create rules for themselves and produce rules that fit the information provided.
The description of a pattern needs to be clarified and refined so that another person can recreate the sequence from the pattern description alone. Thus, describing 6, 12, 24,... as a 'doubling pattern' isn't enough, but saying 'start with six and then keep doubling' is.
Source: First Steps. 2005. *First Steps in Mathematics: Number*. Rigby:Port Melbourne. P.224

Year three NAPLAN Numeracy test links
- Number Pa5erns

Links to Related MAGs
2.1.1 Number sequences 1
2.1.4 Function Machine
2.1.6 Number Patterns 1
2.3.2 Number sequences 2
2.3.7 Number patterns 2
3.2.1 Number Patterns