

The capacity to pattern – to establish a pattern core, to repeat and name it – is an essential skill in mathematics learning. Students who can pattern can predict what comes next with confidence. They know that there is order – to the manipulatives they use, to the days of the week, to the sequences of their days. The capacity to pattern is a necessary pre-requisite for success in algebra – to be able to predict 'down the line' is the foundation of algebraic thinking. Students should be able to represent it in language and actions. Students who are competent with patterning will be able to identify and correct an error in an existing pattern. Students should be able to extend a pattern off of both ends (beyond both the start and the end) and to represent it in language and actions.

Patterning with colour or another physical attribute is the precursor to skip counting. When students build patterns with a pattern core of 2 elements, the number of objects in their pattern increases by 2 each time. To find the total number, then students can skip count by 2's. In this way they follow a new pattern: skip a number, say a number, or skip 1, say 2, skip 3, say 4 etc. Skip counting requires sets of objects to be counted. Success with skip counting depends on being able to subitize, and see groups at a glance.

People Patterns

Make people patterns by lining the students up boy/girl, or sit/stand, or happy/sad faces, hands up/down/by the side.



Movement Patterns

Students do clap, snap, pat, stomp, jump rhythms. For example, AB patterns would be "clap, stomp, clap, stomp..." or "clap, pat, clap, pat..." ABC patterns would be "clap, pat, jump, clap, pat, jump..."



Sound Patterns

Students make sound patterns with musical instruments. Half of the class might have bells and half of the class might have shakers (or some other instrument), and the students play: bells, shakers, bells, shakers... For ABC patterns, the class is divided into three groups with each group playing an instrument in turn.



Trains

Students work with a partner to make an AB pattern train. The students take turns adding a color to make a pattern train with the cubes. Ask students to create patterns with more complexity.





Manipulatives

Students can use lots of different manipulatives to make patterns. For color patterns, use Unifix cubes, dinosaur counters, bear counters, and other animal counters. For shape patterns, use pattern blocks, attribute blocks and shaped buttons. For size patterns, use bear family counters, plastic jewels (from craft store), pompoms (from craft store).





Pattern Walk

Go on a pattern walk and ask students to tell about the patterns they find. Consider giving students digital cameras or iPads to record the pattern they discover.



Nature Patterns

Ask the students to describe patterns they see in nature. Go on a nature walk and have the students draw or record digitally the patterns they see. Back in the classroom, have students record the patterns they discovered in different ways.



Photo Patterns

Present photographs of patterns found in the world. Include these images in tubs of materials and ask students to replicate the patterns they see in the images using manipulatives.



Number Patterns

Encourage the students to make a pattern that repeats 3 times. Ask the students to identify the core that repeats. Focus on increasing patterns by skip counting numbers.

2,4,2,4,2,4... 1,2,3,1,2,3,1,2,3... 5, 10, 15, 20, ...

What's Missing?

Display a pattern that has an element missing from one of the pattern cores. Challenge the students to fix the pattern and find the missing part. Students can create their own "What's Missing?" with their partner fixing it.



Block Towers

Challenge students to create patterns using blocks at the block centre. Encourage students to record their patterns so that others can recreate another day.



Bingo Dabber Patterns

Students use bingo dabbers to make patterns on strips of paper.



Stamp Patterns

Students use rubber stamps to print patterns on paper strips.



Bead Patterns

Students use string coloured pony beads onto a pipe cleaner to make a colour pattern.



Pattern Block Patterns

Students create a caterpillar using pattern blocks to create patterns and then transfer the pattern on to a shape.



Building Fence Patterns

Provide students with plain popsicle sticks and explain that they are to design a fence that has a repeating pattern. They may only use these sticks (and they may not colour them.) Encourage students to build at least 3 repeats of their fence and explain it to a friend. Students should be able to describe it in words, in letters and /or in numbers. Consider having students glue their fence patterns to construction paper.

Whisper Counting

Provide the student with a number line or 100's chart to begin. Explain that you are going to count like a mathematician. Teach students how to whisper count by 2's. That is, when we count by 2's, we only say every second number. Point to the one of the number line and whisper the number 1, but do not say it out loud. Say 2 in a loud voice and then whisper 3. Continue counting in this way using a variety of numbers (by 5, by 10 etc.)

Make fun finger counters and hundreds charts available at a centre and encourage students to practice counting in this way.



Brown Bear, Brown Bear Frames

Look in the Haunted House.

What do I see?

I see a _____ pattern looking at me!

Same Pattern Many Ways

Create a pattern together with the students. Ask: How many ways can you make the same pattern? The students go around the classroom and use different tools to recreate the pattern.

Pattern Poems

Share pattern poems in a pocket chart and have students manipulative the words.

Can you make this pattern with YOUR math tools?

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1 00 10 01*00* 1 001 00100





Spin a Pattern

Students choose a spinner that names different patterns. They spin a pattern and use materials to create it in different ways.



Growing and Shrinking Patterns (Grade 2 & 3 focus)

In the primary years, students work with very simple growing and shrinking shape or number patterns. For growing or shrinking patterns, a small constant value, often 1 or 2, is added to or subtracted from each value or number of shapes. To challenge students, introduce the concept of increasing or decreasing patterns using manipulatives and eventually working with numbers.



Have fun exploring patterns with your students.

Always remember...

- \star Get them engaged.
- ★ Get them thinking.
- ★ Get them reasoning.

