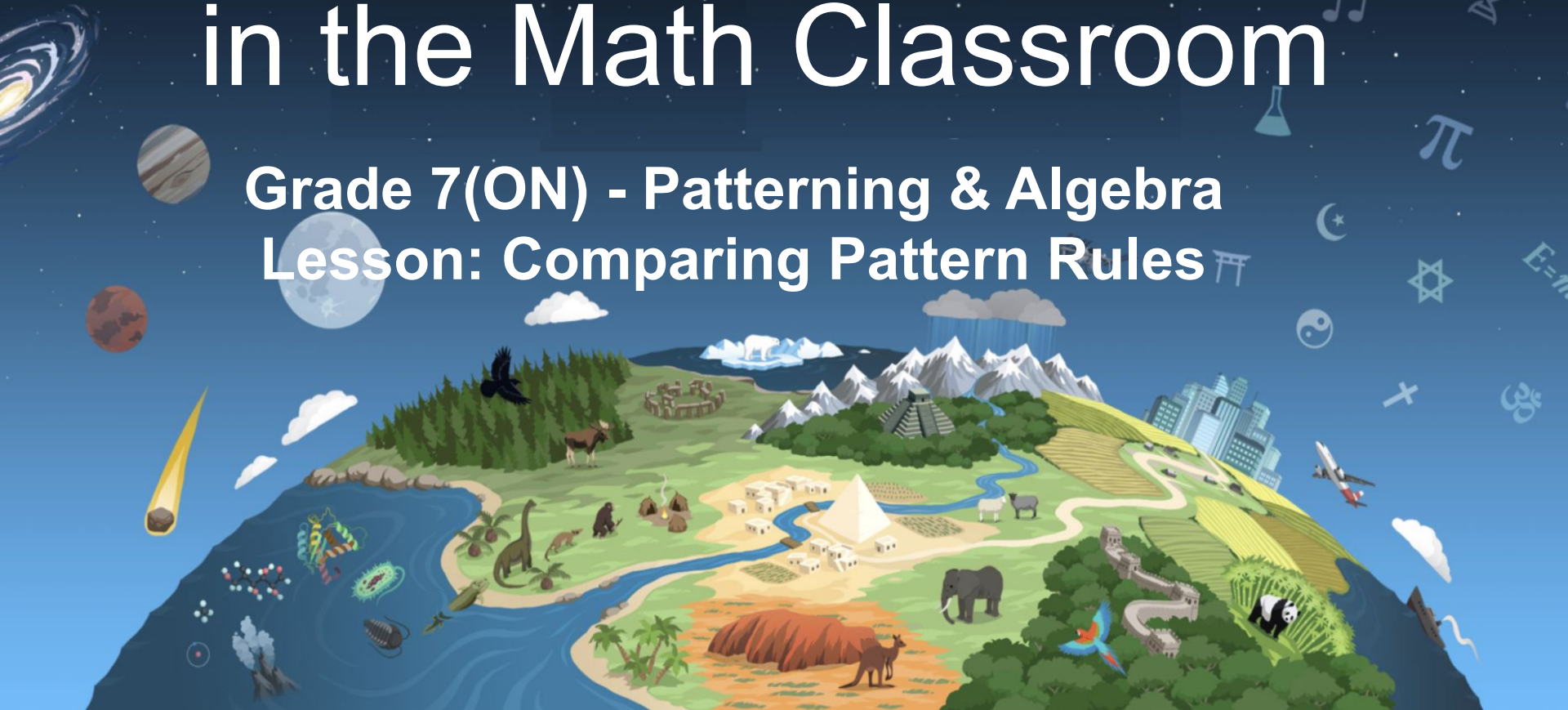


# Strategies for Using Binogi in the Math Classroom

Grade 7(ON) - Patterning & Algebra  
Lesson: Comparing Pattern Rules



## Supported by



Resource Guide for Teachers

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Please visit:

<https://escapeprojects.ca/> for additional resources and information

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# Grade 7 - C1. Algebra

## : Example of Learning Objectives and Big Ideas

### Overall Expectation

**C1.** Identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts

### Specific Expectation

Compare pattern rules that generate a pattern by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term.

### Learning Objectives

Represent linear growing patterns (where the terms are whole numbers) using concrete materials, graphs, and algebraic expressions.

### Big Ideas

Where do we see examples of linear patterns in everyday life?

### Assessment

1. Assessment FOR

Diagnostic questions, Minds On, Action, Consolidation

2. Assessment AS: Consolidation

# C1. Mathematical Terms and Resources/Materials

## Vocabulary

rate, pattern, linear, slope

## Pair/Group Activities

Please follow your school's **Covid-19 safety protocols** for any pair/group activities.

## Language Friendly Pedagogy

At the beginning of the lesson, students will be invited to add key terms in their [Concept Detective](#) and add any new words that they come across throughout the lesson.

## Binogi Related Resources

Video: [Number Sequences](#)

## Additional Binogi Videos Connected to this Unit

[8 Videos on Graphs and Coordinate Systems](#)

## Other Resources

<https://cemc.math.uwaterloo.ca/resources/invitations-to-math/Patterns-Grade6.pdf>

[BANSHO](#)

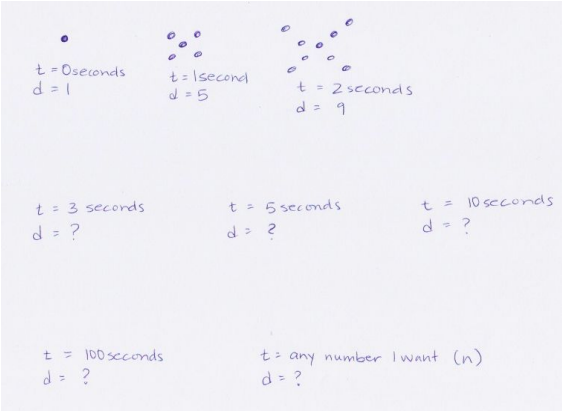
# At the beginning of class... (5 ~ 10 min)

1. Share learning objectives - *Recognize linear growing patterns using manipulatives,, graphs, and algebraic expressions to show that you understand.*
2. Co-create success criteria
  - Sample :
    - *I can use patterns to investigate and compare different ways of finding the "nth" term.*
3. Ask the students to add the following words in their [Concept Detective](#) which they will fill in throughout the lesson:  
*ie. rate, pattern, linear, slope, and any new terms they learned*
4. Diagnostic Questions: Teachers should systematically start with 2 or 3 diagnostic questions. Examples of diagnostic questions can be found:
  - a) using the previous year's specific expectations;
  - b) students taking part in [Binogi quizzes](#).

# Minds On

Task Component	Instruction	Assessment Focus Look Fors	Notes
<p><b>Before (Activation/ Review)</b> ~5-10 mins</p> <p><b>Resources:</b></p>	<p>Watch the Binogi video and discuss in class: <a href="https://app.binogi.ca/l/number-sequences">https://app.binogi.ca/l/number-sequences</a></p> <p>Try the following:</p> <p>1, 1, 2, 3, 5, 8, 13....</p> <p>What pattern(s) do you see? How do they help you come up with the next 10 numbers in this sequence?</p> <p>Try coming up with your own sequence and share it with the class.</p> <p><i>Retrieved from:</i> <a href="https://cemc.math.uwaterloo.ca/resources/invitations-to-math/Patterns-Grade-6.pdf">https://cemc.math.uwaterloo.ca/resources/invitations-to-math/Patterns-Grade-6.pdf</a></p>	<p>How do students represent their understandings and linkages between concepts?</p> <p>How does the activity connect to, and help prepare students for problem solving?</p> <p>How are you interacting with your students?</p>	<p>Teacher records answer / wonderings / understandings. Asks students to elaborate/explain their responses with the class.</p>

# Action

Task Component	Instruction	Assessment Focus Look Fors	Notes
<p><b>During (Working on it)</b> ~15-20 mins</p> <p><b>Materials:</b></p> <p>paper, markers, blocks, ruler, graph paper</p>	<p><b>Individual:</b> Ask students to look at the diagram on the right.</p> <p>Ask them to reflect and record in their journal how they see the shape growing.</p> <p><b>Group:</b> In groups of 3-4, students draw, build and demonstrate how they see the pattern growing.</p>  <p><i>This is an example of a <a href="#">BANSHO</a> activity.</i></p>	<p>What role do I and my students play during the problem solving process?</p> <p>What strategies do we predict students will use to do the math?</p> <p>What strategies are students using to do the math?</p>	<p>Have your students watch the videos in the language of their choice.</p> <p>Record students' thoughts.</p> <p>Think-pair-share: student thinks on their own first, then they share with their partner, then with the class.</p>

# Consolidation/Reflection- Gallery Walk

Task Component	Instruction	Assessment Focus Look Fors
<p data-bbox="79 299 291 463"><b>After (Reflecting/ Connecting/ Consolidating)~ 20- 25 mins</b></p> <p data-bbox="79 554 200 576"><b>Resources:</b></p>	<ol data-bbox="330 303 1528 991" style="list-style-type: none"><li data-bbox="330 303 1528 441">1. In class: Stick students work on the wall based on progression of students ideas and ask them to do a gallery walk to look at everyone's work.</li><li data-bbox="330 500 1528 594">2. Choose 2 or 3 groups to take turns explaining how they saw the shape growing.</li><li data-bbox="330 653 1528 790">3. Class Discussion: Summarize the general patterns that students came up with. Explain how the students drawings and ideas of the shape represents a pattern and discuss what that pattern looks like. Ask students to think about where they have, or would see, an example of this in real life situations.</li><li data-bbox="330 958 1528 991">4. Students complete their <a href="#">Concept Detective</a>.</li></ol>	<p data-bbox="1574 303 1870 495">How are you consolidating student learning? Which strategy was used (Congress, Gallery Walk, Bansho, etc.) and why?</p> <p data-bbox="1574 543 1850 805">How do you determine what should be highlighted? How is it connected to the learning goal/expectations? How is student thinking annotated?</p> <p data-bbox="1574 853 1843 980">What roles do you and your students take on during the consolidation?</p>



# Extensions & Differentiation/Modifications

Extension/Homework - Ask students to log on to Binogi and try some additional videos to enhance their thinking/learning:

[Proportionality](#)

Linear Equations [1](#) & [2](#)

# Parent and Community Connection

## Home Assignment

[Concept Detective](#) - students can complete any terms they did not complete and add any mathematical terms they wish to include in their glossary with their parents.

Students log on binogi and watch the following videos on [Proportionality](#) & Linear Equations [1](#) & [2](#). They can do it with their family members. The aim is to consolidate the student's learning further by engaging in math talks, as well as increasing parental involvement and raising awareness of what they are learning in school.

Some of the questions parents can ask as they watch the video together...

- Can you identify what is happening here? What does linear mean and how do you see it on the graph?

Students and their parents can answer the questions together after watching the [Binogi video](#) OR students can solve the problems first, then ask their parents for help if they encounter any challenges.

