

## 6 PATTERNS

# GRADE SIX MATH: PATTERNS

## LONG RANGE PLANNING - CESD

### Please note:

- These documents may be used to **support planning** for the [Grade 6 math curriculum](#). [En Francais](#)
- Financial Literacy has been included here in order to share opportunities for **cross-curricular connections**.
- These documents **will be updated throughout the year**, aligning with the *suggested* [Grade 6 Long Range Plan](#). [En Francais](#)
- All included resources are available **at no cost**, however some may require you to download from an outside source.
- Resources from the New [Learn Alberta website](#) will require you to login with your google email to access them.

### Organizing Ideas:

In order to reduce the size of these documents, each of the Organizing Ideas have their own documents, which you can access below.

- [Grade 6 Math - NUMBER - Long Range Planning-CESD](#)
- [Grade 6 Math - ALGEBRA - Long Range Planning-CESD](#)
- [Grade 6 Math - GEOMETRY - Long Range Planning-CESD](#)
- [Grade 6 Math - COORDINATE GEOMETRY - Long Range Planning-CESD](#)
- [Grade 6 Math - MEASUREMENT - Long Range Planning-CESD](#)
- [Grade 6 Math - PATTERNS - Long Range Planning-CESD](#)
- [Grade 6 Math - STATISTICS - Long Range Planning-CESD](#)
- [Grade 6 Math - FINANCIAL LITERACY - Long Range Planning-CESD](#)

### Learning Outcomes:

Moved to tabs on left.

- [6P1 Students investigate functions to enhance understanding of change](#). Updated June 2, 2025 (Curriculum wording change)

### Vocabulary Legend:

Student language - Important to know

**NEW to Grade**

Student language

**NEW to Grade**

Tier 2 words\*

Hyperlinked with example or definition

(Professional Language - for the teacher)

### Resource Legend:



Teacher Lesson plan



A book in Learning Services or IMC



Video



Printable

## APLC/ARPCD SUPPORTING DOCUMENTS

### [Patterns Scope and Sequence K-6](#)

This resource provides the Scope and Sequence of outcomes for the Organizational Idea Patterns for Alberta K-6 Mathematics.

Curriculum Planning and Assessment Resources

- [Patterns](#)

Misc

- [Grades 4-6 Resources to Support the Teaching and Learning of Math Verbs](#)

## REMEMBER

Rote memorization focuses on memorizing facts in isolation. This often leads to the belief that math is about memorization and seldom leads to long term retention.

Fluency with facts is developed when students are provided with many opportunities to

- work with facts in a variety of situations, using a variety of models and manipulatives
- connect unknown facts to known facts
- explore patterns within the facts

## Other

### Important note about LearnAlberta Resources

## GRADE SIX MATH: PATTERNS LONG RANGE PLANNING - CESD


In order to access LearnAlberta resources, *you must be logged into your LearnAlberta account and have added your teacher certificate number*. If you have not logged in or you have not added your teacher certificate number, you will end up with a "Page not found" error when clicking on one of the links.

### Other:

[Math Tasks/Manipulatives/Resources](#)

### General Manipulatives

#### Relational Rods

-  Relational Rods
  - Slide 1: Each of these 4 images show the number of relational rods in one bag.
  - Slide 2: Images of the relational rods that can be printed or used when making slideshows or handouts.
- [Polypad](#) (make a teacher account and make a copy!)
  - This is a simple interactive page that displays each relational rod that is infinitely cloned.

### Assessment

Students need opportunities to demonstrate conceptual understanding in a variety of ways, both in formative and summative situations. High quality assessment practices provide opportunities for this when data is triangulated through observations, conversations and product.

Two book series that focus on identifying and analyzing student misconceptions are:

- "Uncovering Student Thinking About Mathematics" Cheryl Rose Tobey et al.
  - In the Common Core Grades 3-6: [Alberta Grades 3-6 alignment guide](#)
  - Grades K-8: [Alberta K-6 alignment guide](#)
- "Mine the Gap for Mathematical Understanding" by John SanGiovanni et al.
  - Grades 3-5: [Alberta Grades 3-6 alignment guide](#)
  - Grades 6-8: [Alberta Grades 4-6 alignment guide](#)

6P1 invest functions to enhance underst of  
change

# GRADE SIX MATH: 6P1

## LONG RANGE PLANNING - CESD

### Patterns (P)

Awareness of patterns supports problem solving in various situations.

6P1 Students investigate **functions** to enhance understanding of change.

UNDERSTANDINGS	KNOWLEDGE	SKILLS & PROCEDURES
<ol style="list-style-type: none"> <li>1. A function is a correspondence between two changing quantities represented by independent and dependent variables.</li> <li>2. Each value of the independent variable in a function corresponds to exactly one value of the dependent variable.</li> </ol>	<ol style="list-style-type: none"> <li>1. A variable can be interpreted as the values of a changing quantity.</li> <li>2. A function can involve quantities that change over time, such as               <ol style="list-style-type: none"> <li>a. height of a person or plant</li> <li>b. temperature</li> <li>c. distance travelled</li> </ol> </li> <li>3. A table of values lists the values of the independent variable in the first column or row and the values of the dependent variable in the second column or row to represent a function at certain points.</li> <li>4. The values of the independent variable are represented by x-coordinates in the Cartesian plane.</li> <li>5. The values of the dependent variable are represented by y-coordinates in the Cartesian plane.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify the dependent and independent variables in a given situation, including situations involving change over time.</li> <li>2. Describe the rule that determines the values of the dependent variable from values of the independent variable.</li> <li>3. Represent corresponding values of the independent and dependent variables of a function as points in the Cartesian plane.</li> <li>4. Write an algebraic equation that represents a function.</li> <li>5. Recognize various representations of the same function.</li> <li>6. Determine a value of the dependent variable of a function given the corresponding value of the independent variable.</li> <li>7. Investigate strategies for determining a value of the independent variable of a function given the corresponding value of the dependent variable.</li> <li>8. Solve problems involving a function.</li> </ol>

### SPECIAL CARE AND ATTENTION

#### Curriculum Update

6P1.1.4 was changed from "Write an algebraic expression that represents a function." to "Write an algebraic equation that represents a function."

#### Connections

This is an important learning outcome and should be explored in depth and take up a significant amount of time throughout the school year. Mathematics is a pattern finding subject. [Mathematics is the study of patterns](#). Mathematicians notice, describe and generalize patterns. Students should too.

### VOCABULARY

Algebraic expression  
Cartesian plane  
Change  
Column  
Correspondence /  
Corresponding

Dependent variable  
Describe  
Determine  
Function\*  
Identify

Independent variable  
Investigate  
Quantity  
Recognize  
Represent

Row  
Rule  
Strategies  
Table of values


Value\*  
X-coordinates  
Write  
Y-coordinates

### ASSESSMENTS

#### Formative Assessment

- "Unit Rate as Slope" *Mine the Gap For Mathematical Understanding: Grades 6-8* pg. 178
- "Function Tables" *Mine the Gap For Mathematical Understanding: Grades 6-8* pg. 236

#### Summative Assessment

-  6P Assessment Questions

### INSTRUCTION

#### High Leverage Instructional Strategies / Practices

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#### Learning Experiences

APLC


## GRADE SIX MATH: 6P1 LONG RANGE PLANNING - CESD

- [Indigenous Culture Based Learning in Alberta Curriculum](#)

### Warmups

-  P1 Math WarmUps/Talks (Red Deer Public)  FR P1 Math WarmUps/Talks

### Learning

-  CESD - Teacher Created Resources
  - [Grade 5 / 6 Arithmetic sequences](#) - note once you get to the physical graph, you would then use students as the manipulatives. The slides are provided to walk you through what to have them to do, and as a visual for students as you do it.
    - [Printables](#) for the presentation
    - Note: Everything prior to the slide titled "Grade 6" focuses on outcomes from grade 4 and 5. However, if students haven't experienced these slides, they should be used to introduce the activity.
- DESMOS
  - [Guess my rule](#) - This is a great introduction to functions.
  - [Linear Relationships - Self-Checking](#) - This is a review activity. Some of the questions will be challenging.
- Math is Visual
  - [Visual Patterns](#)
  - [Growing Geometric Patterns](#)
  - [Using the Graph of a Linear Relationship to Make Predictions](#)
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### Gizmos on LearnAlberta

- [Function Machines 1 \(Functions and tables\)](#) Students explore functions by creating function tables.
  - [Teacher version with answer key](#)
- [Function Machines 2 \(Functions and tables\)](#) Students explore function patterns by creating function tables and graphs.
  - [Teacher version with answer key](#)
- [Function Machines 3 \(Functions and problem solving\)](#) Students solve word problems using function machines.
  - [Teacher version with answer key](#)
- [Introduction to Functions](#) Students explore working with functions using tables of values, mapping diagrams, and coordinate planes.
  - [Teacher version with answer key](#)
- [Linear Functions](#) Students plot ordered pairs onto a grid and view the mapping diagram or table of values. Problem solving extends to identifying if the dot graph is a function or a relation.
  - [Teacher version with answer key](#)
- [Points, Lines, and Equations](#) Students explore linear equations by manipulating two ordered pairs.
  - [Teacher version with answer key](#)

### Math Tasks ([Collated by CBE](#))

- Problem solving with patterns
  - [Open Middle](#) This Open Middle question examines the relationship between changing values in an algebraic rule representing a pattern.
  - [Pocket Money](#) This Problem explores how students can work to identify the dependent and independent variables in each situation, including situations involving change over time. Note | In #3, this question explores exponential growth and can be discussed but needed for assessment.
  - [Tables and Chairs](#) This task is aimed at strengthening student's ability to investigate strategies for determining a value of the dependent variable of a function given the corresponding value of the independent variable.
  - [Hexagon Lines](#) This task is similar to Tables and Chairs but uses hexagons rather than squares in its pattern. Students are faced with solving the algebraic rule to determine a given perimeter with an unknown number of hexagons.

### Opportunities to Connect Outcomes:

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### Resources

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### INDIGENOUS RESOURCES

#### From ARPDC

- Pulled directly from [Infusing Indigenous Knowledge Into Curriculum](#)
  - Examine animal populations, finished bead work, diverse human populations.
  - Identify dependent and independent variables using:

## GRADE SIX MATH: 6P1

### LONG RANGE PLANNING - CESD

- A strawberry plant (e.g., the constant factor is three leaves on the plant; the variable is how many strawberry plants are needed to make a pot of tea)
- The time it takes to tan a hide (e.g., constant factor is the time required for one section; the variable is the size of hide and/or the number of people tanning it)
- Relationships (e.g., the age difference between mother and daughter never changes)
- Canoe building
- Apply examples of the Cartesian plane explored in previous outcomes (6N1)
  - Work with coordinates to ensure fish can be found using a fish finder
  - Compare with radar (a circle)
- Solve problems such as calculating materials to make enough knives for a village.

### PROFESSIONAL LEARNING

#### Learn Alberta Math Planning Guides

The following Planning Guides were developed for the 2007 Program of Studies. However, the planning process and many of the tasks and assessments still align with the 2022 AB Mathematics Curriculum. Please ensure that the Learning Outcome and Knowledge, Understanding, and Skills and Procedure statements are kept in mind as tasks are selected.

- [Patterns and Relations \(Patterns\)](#)