

Mathematics Tasks | Grade 5

The tasks listed below support teaching and learning related to the learning outcomes from the 2022 Mathematics Curriculum for Grade 5. Multiple forms of representation (physical, visual, contextual, verbal, and symbolic) can be incorporated at any stage of the learning cycle to support students' conceptual understanding of mathematical concepts.

Many of these resources offer ideas for implementing the task, as well as suggestions for scaffolds and extensions. Some tasks are appropriate for multiple grades, especially with modifications. Therefore, teachers may wish to look at tasks in the grades above and below for more tasks.

Number Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.				
Learning Outcome: Students analyze patterns in place value.				
Patterns in place value	<p>Thousands and Millions</p> <p>Questions to prompt thinking and discussions around larger numbers.</p> <p>Note Not all questions align with Grade 5 learning outcomes or concepts that students will have explored in previous games.</p>	<p>We've Got Your Number</p> <p>Students use various clues to determine a mystery number. (Solution)</p> <p>Note This is an extension task, as the curriculum learning outcome requires students to express numbers within 10 000 000.</p>	<p>Roll on Place Value (p.16)</p> <p>The goal of the game is to create the largest number. Players take turns rolling a die, placing it into the tray and announcing its place value for that roll.</p> <p>Note The game board could be modified to include place values up to 10 000 000. A place-value die refers to a 10-sided die, however a 6-sided die could be used to engage in this task.</p>	
	Comparing and ordering numbers	<p>Betweeners (p.2)</p> <p>Students' roll dice to create a number between 0.111 and 666. The student that creates the number between their two partners wins.</p> <p>Note If a 3-in-a-Cube die is not available, students will need to roll a single die three separate times. The numerals available can be expanded by increasing the sides on the die (i.e., using a 10-sided die.)</p>	<p>Final Lap</p> <p>A 3-Act Task involving NASCAR and comparing and ordering decimals to the thousandths.</p>	<p>Decimals on a Number Line</p> <p>An <i>Open Middle</i> task developing number sense while working with decimals on the number line.</p>

Mathematics Tasks | Grade 5

Number Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.		
Learning Outcome: Students add and subtract within 1 000 000, including decimal numbers to thousandths, using standard algorithms.		
Adding and subtracting including decimals	<p>The following Planning Guide was developed for the 2007 AB Mathematics Program of Studies (PoS). 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.</p> <ul style="list-style-type: none"> ▪ Estimation Strategies: Step 3 includes sample activities to examine estimation using front end and compensation strategies as well as Estimating Using Compatible Numbers and Compensation. 	
	<p>Use of Place Value Chart for Additive Thinking with Decimals (p. 27) Using place value to make sense of adding and subtracting decimals.</p>	<p>Greatest Difference An <i>Open Middle</i> problem to subtract decimals.</p>

Number: Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Students determine divisibility of natural numbers.			
Divisibility	<p>Digital Division This task challenges understanding in divisibility rules and can easily be adapted with additional divisors.</p>	<p>Dozens This problem offers a twist on the usual way of assessing students' knowledge of divisibility tests. Students are asked to determine the largest possible number of specific criteria given.</p>	<p>Abundant Numbers A problem to explore factors and practice addition.</p>
	<p>Menu Math Divisibility A challenge to generate numbers to meet each constraint at least once using as few numbers as possible. Constraints or “menu items” can be adjusted.</p> <p>Note See Menu Math homepage for more information about the routine and how to adapt.</p>	<p>Divisibility An <i>Open Middle</i> challenge to create a 3-digit number divisible by certain factors.</p>	<p>Divisibility 2 Another <i>Open Middle</i> challenge is to apply understanding of divisibility tests.</p>

Mathematics Tasks | Grade 5

Number: Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.				
Learning Outcome: Students multiply and divide natural numbers within 100 000, including with standard algorithms.				
Multiplying and Dividing Natural Numbers	Close to 10,000 This <i>Open Middle</i> task challenges students to achieve a product as close to 10,000 as possible by multiplying a 3 digit by 2-digit number.	Multi-digit Division This <i>Open Middle</i> task challenges students to achieve the smallest quotient possible by dividing a 3 digit by 1-digit number.	Multi-Division This <i>Open Middle</i> task challenges students to achieve a quotient greater than 300 and one that is less than 300 by dividing a 3 digit by 1-digit number.	Closest to 7,000 This <i>Open Middle</i> task challenges students to achieve a product as close to 7,000 as possible by multiplying a 2 digit by 2-digit number.

Number: Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Interpret improper fractions.			
Interpret improper fractions	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. <ul style="list-style-type: none"> Improper Fractions and Mixed Numbers: This Planning Guide was developed for Grade 6 in the 2007 PoS. It contains information and sample activities to develop an understanding of the relationship between improper fractions and mixed numbers. 		
	Comparing Fractions An <i>Open Middle</i> problem with multiple entry points which could be used at different points in this learning progression depending upon which constraints are used.	More Fraction Bars Compare and order bars of different lengths as compared to a given referent.	Menu Math Task Students build as few fractions as possible to satisfy each of the 8 constraints at least once.

Mathematics Tasks | Grade 5

Number: Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Students add and subtract fractions with common denominators.			
Add & Subtract Fractions with a Common Denominator	Same But Different A prompt to compare an addition expression of unit fractions and a sum.	Adding and Subtracting Positive Fractions with Like Denominators (p. 7 and 8) This Planning Guide was developed for Grade 7 in the 2007 PoS. It contains suggestions for accessing prior knowledge, sample activities and student look fors.	Fraction Talks A variety of images from the <i>Math for Love</i> website can be used as prompts to add or subtraction fractions with common denominators. Note Select images that include fractions with common denominators when the “whole” is clearly identified.

Number: Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Students employ ratios to represent relationships between quantities.			
Ratios	Rod Ratios This is an interactive activity that allows students to explore ratios involving Cuisenaire rods.	Menu Math: Percentages with Fractions and Decimals Students build as few fractions as possible to satisfy each of the 8 constraints at least once.	Des-Farm Students will find part-to-whole ratios of plants on a farm and use these ratios to determine the equivalent fraction, decimal, or percent representation.

Mathematics Tasks | Grade 5

Algebra Organizing Idea: Equations express relationships between quantities.				
Learning Outcome: Students interpret numerical and algebraic expressions.				
Interpreting numerical and algebraic expressions	<p>Heads and Feet</p> <p>An open problem that can be completed using trial and error or use substitution to solve for variables in an algebraic equation.</p>	<p>Splat!</p> <p>Splat! engages students in solving equations with one or two operations using a visual representation.</p> <p>Single Splat! (Coefficient = 1)</p> <p>Splat 2.1</p> <p>Splat 2.2</p> <p>Multiple Splats (Coefficient > 1)</p> <p>Splat 3.1</p> <p>Splat 3.2</p>	<p>SolveMe Puzzles: Mobiles</p> <p>An online interactive site with puzzles at different levels to reinforce the concept of equality, equation solving, and number sense. This tool will help strengthen an understanding of unknown quantities within an algebraic expression.</p>	<p>Make 24</p> <p>This task explores the creation of equations using multiple operations in order to create equivalency.</p>
	<p>Fruity Totals</p> <p>An interactive activity that uses unknown variables and the concept of sum to determine the value of each variable.</p> <p>Note Due to the interactive nature of this task it can provide multiple opportunities with similar problems.</p>	<p>Substituting a Value</p> <p>This is an Open Middle problem that tasks learners with substituting unknown variables to create equivalency in multiple equations.</p>	<p>Different Deductions</p> <p>This task examines the relationship of equality of an equation when solving for unknown variables.</p> <p>Note This task can be used to relate repeated addition of a variable to the product of a number and a variable.</p>	<p>Whirlpool Aero Car</p> <p>This <i>3-Act Task</i> involves multiplicative thinking and equation solving. Equations could be solved informally or expressed symbolically.</p>

Mathematics Tasks | Grade 5

Geometry: Organizing Idea: Shapes are defined and related by geometric attributes.			
Learning Outcome: Students investigate symmetry as a geometric property.			
Investigate symmetry as a geometric property	<p>Flagged Up</p> <p>A problem that combines central symmetry has rotational symmetry by 180° and a line of reflection to find the final position of a given object.</p>	<p>Back in Time</p> <p>This problem challenges students to explore how a central line of symmetry can impact the appearance of numbers in a 24-hour display.</p> <p>Note This could provide an opportunity to use Miras to help identify lines of symmetry using digits in a 24-hour clock.</p>	<p>Let Us Reflect</p> <p>A Nrich task that explores how multiple central lines of symmetry will display a centre of rotation. This activity requires a Mira or mirror to help explore how symmetry can manipulate the shape of a square.</p>
	<p>Shady Symmetry</p> <p>In this activity, students will explore symmetrical patterns in squares and triangles as it relates to line and rotational symmetry.</p>	<p>Doubly Symmetric</p> <p>This puzzle aims to strengthen student understanding of lines of symmetry and rotational symmetry.</p>	<p>Symmetry Challenge</p> <p>This task aims to strengthen students understanding of various lines of symmetry. Students will systematically explore the range of symmetric designs that can be created by shading 3x3 square.</p>

Coordinate Geometry Organizing Idea: Location and movement of objects in space can be communicated using a coordinate grid.			
Learning Outcome: Students relate location to position on a grid.			
Relating location to position on a grid	<p>What Are You Plotting?</p> <p>Understanding x and y coordinates and making sense of vertical and horizontal alignment.</p>	<p>Open Middle</p> <p>Students use the digits 0 to 9 at most one time each, fill in the blanks to create a quadrilateral with an area of 16 square units.</p> <p>Note Students should be given a 1 cm^2 coordinate grid to align with the learning outcome related to area.</p>	<p>When Lightning Flashes, is it Raining? (p.73)</p> <p>A task that connects area to the coordinate grid. Students plot and connect points on the coordinate grid to form an image. Then, students estimate area of the image and percent of the entire grid that is covered by the image.</p>

Mathematics Tasks | Grade 5

Measurement Organizing Idea: Attributes such as length, area, volume, and angle are quantified by measurement.					
Learning Outcome: Students estimate and calculate area using standard units.					
Area	<p>Shikaku Puzzles The goal of a Shikaku puzzle is to subdivide the grid into rectangles (and squares) so that the number in each rectangle refers to the area of that rectangle. Only one number may appear in each rectangle. Additionally, no rectangles may overlap.</p>	<p>Would You Rather... Area A task that exploring how area is impacted by the length or width of the sides of a space.</p> <p>Note Imperial units are not part of the learning outcome for Grade 5.</p>	<p>Wrapping Paper Cut Out A task that explores the relationship between perimeter, area and solving problems involving either within a rectangle.</p> <p>Note Students could be challenged to determine how the area has changed.</p>	<p>Welcome to the Fold (p. 42-43) This <i>Problem of the Week</i> from the University of Waterloo provides opportunities to explore relationships between perimeter and area using concrete representations.</p>	<p>Fence It A task that examines the unique qualities of a rectangular space with a variety of side lengths. How is area related to the rectangles side lengths?</p>

Patterns: Organizing Idea: Awareness of patterns supports problem solving in various situations.		
Learning Outcome: Students relate terms to position within an arithmetic sequence.		
Arithmetic Sequences	<p>Simple Patterns An activity where students are challenged to create an arithmetic sequence using an Open Middle task.</p>	<p>Seven Squares A task that examines a simple sequence, how it constructed and the patterns that are present within.</p>
	<p>Visual Patterns The following patterns can be used to, “Describe a rule, limited to one operation, that expresses correspondence between positions and terms of an arithmetic sequence.” Pattern #282, 284, 286</p> <p>The following patterns can used to, “Write an algebraic expression, limited to one operation, that represents correspondence between positions and terms of an arithmetic sequence.” Pattern #285, 356, 442</p>	<p>Arithmetic Sequences- Marilyn Burns Three tasks where students use a table of values to represent an arithmetic sequence and generalize a rule to determine a value for larger terms in the sequence.</p>

Mathematics Tasks | Grade 5

Statistics Organizing Idea: The science of collecting, analyzing, and interpreting data can inform understanding and decision making.			
Learning Outcome: Students analyze frequency in categorical data.			
Frequency	<p>Letter Frequency (Alphabet probability)</p> <p>A multi-lesson activity examining the frequency in which letters appear in common text found in the classroom or library. This can help strengthen an ability to determine frequency of a category within a set of data by counting/collecting data points.</p>	<p>Beans and Scoops</p> <p>An activity examining the frequency of different variables when sampling a larger population.</p> <p>Note The concept of median is not part of the learning outcome in Grade 5.</p>	<p>Strength in Numbers</p> <p>Student data is collected based on estimations and frequency of responses is recorded in graphs. The student results can be used as an opportunity to discuss mode.</p> <p>Note Slide 13 discusses the concepts of mean and median, which are not part of this learning outcome in Grade 5 and can be omitted from the activity.</p>
Open-ended and closed-list questions	<p>Reaction Timer</p> <p>A hands-on task aimed at collecting data in real time to help develop an understanding of frequency and the various ways to represent data.</p>	<p>The Lives of Presidents</p> <p>This task examines the relationship between statistical data and wonderings students have about the data. A unique connection between readily available data and the idea that data can be collected by asking closed-list and open-ended questions.</p>	<p>Real Statistics</p> <p>This task will develop an understanding of how frequency can be used to summarize data collected through closed-list questions. Open-ended questions are provided in the task to encourage students to consider possible reasons for trends.</p>