

## Mathematics Tasks | Grade 4

The tasks listed below support teaching and learning related to the learning outcomes from the 2022 Mathematics Curriculum for Grade 4. 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 apply place value to decimal numbers.			
Place value and decimal numbers	<a href="#">Activities on a Gattegno Chart</a> Explore patterns and place value using a Gattegno chart.	<a href="#">Round Off Dragon</a> A fun Math Pickle story and challenge to introduce decimals as students work to get a precise measurement.	<a href="#">Comparing Hundredths and Tenths</a> Another <i>Open Middle</i> challenge to explore the relationship between decimals and decimal fractions.
	<a href="#">Round the Dice Decimals 1</a> <a href="#">Round the Dice Decimals 2</a> Two versions of a game using dice or dice interactive to develop number sense and rounding involving decimals to the tenth and to the hundredth.	<a href="#">Spiralling Decimals</a> A challenging game to order decimals between 0 and 1.  <b>Note  </b> The use of decimal numbers to the thousandths can be a challenge or adjusted to tenths and hundredths.	<a href="#">Decimals on a Number Line</a> An <i>Open Middle</i> problem to create numbers on a number line.  <b>Note  </b> The use of decimal numbers to the thousandths can be a challenge or adjusted to tenths and hundredths.

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Number Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Students add and subtract within 10 000, including decimal numbers to hundredths.			
Adding and subtracting within 10 000	<a href="#">The Puzzler</a> (p.6) Students are asked to determine sums of consecutive numbers to equal various target numbers.	<a href="#">Sum to 10 000</a> <i>Open Middle</i> problem where students are tasked with finding the closest sum to 10,000 using two 4-digit addends.	<a href="#">It was 2010!</a> Students are asked, what could the questions be if the answer is 2010?
Adding and subtracting including decimals to hundredths	<a href="#">Ch-ch-ch-change!</a> (p.8) Students are challenged to use the least number of coins to determine a sum using Canadian and Australian currency.  <b>Note  </b> A discussion opportunity: How can currency values influence familiarity with skip-counting or adding/subtracting different amounts?	<a href="#">Adding Decimals</a> An <i>Open Middle</i> problem that could be changed to subtraction to support practice of both operations.	<a href="#">Greatest Difference</a> A challenging <i>Open Middle</i> problem to subtract decimals.

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Number Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.					
Learning Outcome: Students explain properties of prime and composite numbers using multiplication and division.					
Properties of prime and composite numbers	<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"> <li>▪ <b>Factors and Multiples:</b> This Planning Guide was developed for Grade 6 in the 2007 PoS. It contains information and sample activities to explore factors and multiples within 100.</li> </ul>				
	<p><b><u>Number Visuals</u></b> A lesson from <i>youcubed</i> where students investigate visual representations of number as they look for patterns to understand the properties of prime and composite numbers.</p>	<p><b><u>Tic Tac Toe Products</u></b> This a strategy-based activity which provides practice to build fluency in single digit multiplication.</p> <p><b>Note  </b> Students could keep track of the factors selected and corresponding products to explore relationships in various ways.</p>	<p><b><u>Composite Numbers</u></b> An Open Middle task that challenges students to create composite numbers, acknowledging a composite number has factors other than one and itself.</p>	<p><b><u>Abundant Numbers</u></b> This task is a unique blend of factoring and addition of factors in order to solve a given problem. This activity will help strengthen an ability to determine the factors of a number up to 100.</p> <p><b>Note  </b> Students can find factors of numbers by generating models of rectangles (including squares) using square tiles or grid paper.</p>	<p><b><u>3 Act Task (K-6)</u></b> This 3 Act Task can be used to explore factors and multiples, prime and composite numbers, and the associative property of multiplication.</p>

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Number Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Students multiply and divide natural numbers within 10 000.			
Number facts	<a href="#">Odd and Even</a> A problem to explore multiplication of odd and even numbers using various representation methods.	<a href="#">Fruit Shop</a> Image prompts and questions to look for similarities/differences and connections using the array as a multiplicative structure.	<a href="#">Planting Carrots</a> An <i>Open Middle</i> problem that could be used as a framework to create other similar open-ended word problems.
Multi-digit multiplication	<a href="#">Brawny Wall</a> A 3-Act Task to explore a couple multiplication questions using a visual array of paper towel packages.	<a href="#">Multiplying a Two-Digit Number by a Single-Digit Number</a> An <i>Open Middle</i> problem that can provide practice of multiplication to meet constraints. Numbers and constraints could be modified for more challenges.	<a href="#">Expert Predictions</a> (Pages 6-8) This <i>Problem of the Week</i> from the University of Waterloo provides opportunity to apply operation skills as well as some information that might be used in a discussion about becoming an “expert” in mathematics.
	<a href="#">Fare’s Fair!</a> A task that explores solving problems using multiplication and division, including problems involving money.		
3-digit by 1-digit division	<a href="#">Sharing is Caring</a> A 3-Act Task to explore division with a variety of divisors.	<a href="#">Jumping Jelling Beans</a> A 3-Act Task to explore multiplication and division using visual images in parallelogram (rectangular) and hexagonal arrays.  <b>Note  </b> The task can be extended to use 18 as the divisor.	<a href="#">Division Rules</a> This challenge explores 3-digit by 1-digit division and encourages students to notice patterns and conjecture, and test rules.

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Number Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Students apply equivalence to the interpretation of fractions.			
	<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"> <li>▪ <a href="#">Fractions</a>: This Planning Guide was developed for Grade 5 in the 2007 Program of Studies. It contains information and sample tasks to explore equivalent fractions.</li> </ul>		
Equivalent fractions	<a href="#">Fractional Wall</a> A version of fraction strips that prompts work with equivalent fractions.	<a href="#">Equivalent Fractions</a> An <i>Open Middle</i> question to explore three equivalent fractions.	<a href="#">Creative Math Prompt:</a> Fraction task that asks, what do you notice? What do you wonder?
	<a href="#">Tumbling Down</a> A very short animation to spark curiosity about equivalent fractions.	<a href="#">Benchmark Fractions</a> Another <i>Open Middle</i> challenge to place fractions on a number line.	<a href="#">Equivalent Fractions</a> This <i>Open Middle</i> problem allows students to explore how to determine fractions equivalent to a given fraction.
Relate fractions and decimals	<a href="#">Fraction to Decimal</a> An <i>Open Middle</i> prompt to create an equivalent fraction and decimal.	<a href="#">Comparing Fractions to Decimals 1</a>  <a href="#">Comparing Fractions to Decimals 2</a> <i>Open Middle</i> tasks to compare a fraction to a decimal.	<a href="#">Same But Different</a> Prompts to compare two symbolic representations of numbers using the routine Alike and Different or Same But Different. <a href="#">Equivalent</a> <a href="#">Not equivalent</a> <a href="#">Zero at end of decimal</a>

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Number Organizing Idea: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.			
Learning Outcome: Students interpret percentages.			
Interpret percentages	<p><u><a href="#">Open Middle Problems</a></u> The following problems are Open Middle problems involving percentages of a given value.</p> <p><u><a href="#">Percent of a Quantity</a></u> <u><a href="#">Related Percentages</a></u> <u><a href="#">Percentages</a></u></p>	<p><u><a href="#">How Many Bags of Chips Will There Be?</a></u> Images of multi-pack bags of potato chips that can be used to engage students in exploration strategies to write fractions, decimals and percentages for the same part-whole relationship.</p> <p><b>Note  </b> Technology might be used to explore numbers in class preferences as well as the 54 Classic Mix problem as this is beyond scope of learning outcome.</p>	<p><u><a href="#">Doughnut Percents</a></u> A team-building task to explore relationships between fractions, decimals and percentages.</p>
Relating fractions, decimals, percent	<p><u><a href="#">Fractions Decimals and Percentages Desmos</a></u> This activity uses hundred grids to visually show fractions, decimals and percentages.</p>	<p><u><a href="#">Battery – Fraction, Decimal, Percent</a></u> This activity allows students to explore, and learn equivalencies of percentages, decimals, and fractions by examining battery life.</p>	<p><u><a href="#">Matching Fractions, Decimals &amp; Percent</a></u> A digital matching activity that builds connections in the interconnected relationship with fractions, decimals and percent.</p> <p><b>Note  </b> Non-digital resources are provided in this task to accompany the virtual element.</p>

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Algebra Organizing Idea: Equations express relationships between quantities.					
Learning Outcome: Students represent and apply equality in multiple ways.					
Order of operations	<a href="#">The 24 Game</a> A great problem to work with number sense, mental math, and order of operations.	<a href="#">Math Magic Trick</a> Fun “magic trick” with operations that can lead into discussion of order of operations and algebraic thinking.	<a href="#">Exploring Wild and Wonderful Number Patterns</a> A problem that connects number operations to patterns and encourages student to create their own unusual patterns.	<a href="#">Albert’s Insomnia</a> Students select 4 numbers (2 between 1 and 7 and two between 8 and 15). Using no more than these 4 numbers and order of operations, students are challenged to see how high they can count.	<a href="#">And the Winner is..</a> Found on page 42, students are presented with two solutions for an order of operations question. They need to determine which solution is correct and explain why.
Solving Equations	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. <ul style="list-style-type: none"> <li> <a href="#">One-step Equations</a>: Exploration of solving one-step equations (involving addition, subtraction and multiplication) using balance models and number sentences, originally developed for Grade 5 in the 2007 PoS.             </li> </ul>				
	<a href="#">Sweetie Box</a> This activity provides an opportunity to discuss how unknown values impact the overall value of an expression.	<a href="#">Splat!</a> Splat! engages students in solving equations with one or two operations using a visual representation.  <a href="#">Splat 2.1</a> <a href="#">Splat 2.2</a>	<a href="#">SolveMe Puzzles (Mobiles)</a> An online interactive site with puzzles at different levels to reinforce the concept of equality, equation solving, and number sense.	<a href="#">Super Shapes</a> Questions to practice addition and subtraction and reinforce understanding of the inverse relationship.	<a href="#">True or False</a> This task activates thinking as it relates to Investigating preservation of equality using a balance model.  <b>Note</b>   This task can be elevated by making some values unknown in the equations.

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Geometry Organizing Idea: Shapes are defined and related by geometric attributes.			
Learning Outcome: Students relate geometric properties to shape.			
Relating geometric properties to shape	<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"> <li>▪ <a href="#">Quadrilaterals</a>: This Planning Guide was also developed for Grade 5 in the 2007 Program of Studies. The focus on quadrilaterals only addresses part of the 2022 Grade 4 Learning Outcome about geometric properties.</li> </ul>		
	<p><a href="#">Quadrilaterals</a> A task that provides opportunities to explore various quadrilaterals and geometric properties.</p>	<p><a href="#">Mathematical Art</a> Identify shapes and geometric properties in pieces of artwork. See the example on p. 4.</p>	<p><a href="#">Name That Triangle</a> Prompts to engage in mathematical discourse about triangles.</p>
	<p><a href="#">Inside Triangles</a> A task to explore and classify different types of triangles while developing students' abilities to work systematically.</p>	<p><a href="#">Transformations on a Pegboard</a> An interactive task (online or with geoboards) to explore geometric properties of shapes as well as other concepts such as area.</p>	<p><a href="#">Which One Doesn't Belong?</a> Select appropriate images to engage students in mathematical discussion on geometric properties of regular and irregular polygons.</p>
	<p><a href="#">Polygon Angles: What do you Notice?</a> Provides a nice visual for students.</p>	<p><a href="#">Nine-Pin Triangles</a> A challenge to generate different types of triangles.</p>	<p><a href="#">Where Are They?</a> A challenge to generate various polygons on isometric grid paper.</p>

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Measurement Organizing Idea: Attributes such as length, area, volume, and angle are quantified by measurement.				
Learning Outcome: Students interpret and express area.				
Solve problems involving area of rectangles	<p><a href="#">Cut and Make</a></p> <p>This activity will help to strengthen the idea that area remains the same when decomposed or rearranged.</p>	<p><a href="#">Area and Perimeter</a></p> <p>A task to explore the relationship between perimeter and area using regular and irregular shapes.</p>	<p><a href="#">Four Triangles</a></p> <p>This task invites learners to be creative with a familiar triangle in a logical way to create as many different shapes as possible.</p>	<p><a href="#">Square Building</a></p> <p>This task examines the use of non-standard units by tiling to explore area. It also incorporates increasing patterning as tiles are added to create new area(s).</p>
	<p><a href="#">Fewest Squares</a></p> <p>A task that examines the relationship between rectangles, squares and the unifying concept of area that connect both.</p> <p><b>Note  </b> This lesson may be most successful using erasable white boards.</p>	<p><a href="#">Piles of Tiles</a></p> <p>A <i>3-Act task</i> to explore calculating the number of tiles needed to cover a table.</p> <p><b>Note  </b> Similar problem solving can be done with tables or spaces in your classroom to work initially with smaller numbers.</p>	<p><a href="#">Shikaku Puzzles</a></p> <p>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><b>Note  </b> These puzzles can be tied to the mathematics curriculum in multiple ways. They are a natural fit for a unit on area. They also make a great tie-in to prime vs composite numbers.</p>	

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Measurement Organizing Idea: Attributes such as length, area, volume, and angle are quantified by measurement.				
Learning Outcome: Students determine and express angles using standard units.				
Angles	From Marilyn Burns, a series of lessons to engage students in a study of angles using a hands-on approach. <ul style="list-style-type: none"> <li>▪ <a href="#">Teaching About Angles - A Hands-On Approach</a></li> </ul>			
	<a href="#">Angles – Interactive Simulator</a> An interactive digital tool for students to understand the structure of an angle and the motion of a length around a vertex.	<a href="#">Olympic Turns</a> Photos of Olympic athletes that involve angles. Students can compare the angles indirectly or cut out images to compare directly.	<a href="#">Take the Right Angle</a> This task has students identifying when the hands on an analog clock form a right angle.	<a href="#">Right Angle Challenge</a> A challenge to make and identify right angles made with two sticks.
	<a href="#">Estimating Angles</a> An online interactive tool to practice estimating angles.	<a href="#">Railing Reconstruction</a> A 3-Act task where students can explore parallel lines, measuring angles and supplementary angles.  <b>Note</b>   The concept of opposite angles is beyond the scope of the learning outcome. Students could use a protractor to measure angles and explore relationships.	<a href="#">Flangles</a> (p. 44) A task that explores both estimation of angles and the classification of each angle. through the use of signal flags corresponding to a given letter in the alphabet.	<a href="#">Angle Mazes</a> Angle Maze Puzzles from Naoki Inaba challenge students to find a path through a maze by being able to recognize common angle measurements.

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Patterns Organizing Idea: Awareness of patterns supports problem solving in various situations.			
Learning Outcome: Students interpret and explain arithmetic and geometric sequences.			
Arithmetic sequences	<a href="#">Visual Patterns</a> Students explore arithmetic sequences in patterns. Suggested patterns: #10, #59 (number of white tiles), #207	<a href="#">Domino Sequences</a> Students can explore multiple sequences represented with dominoes and identify which ones are arithmetic sequences.	<a href="#">Six in a Circle</a> A task to review multiples and factors as well as sequences. See <a href="#">Student Solutions</a> for ways to record answers and explore arithmetic sequences.
	<a href="#">Times Tables Shift</a> This task allows for practice of multiplication facts as students explore increasing or decreasing patterns.	<a href="#">Crafty Construction</a> (p.54) A problem that challenges learners to create and explain increasing or decreasing sequences, including numerical sequences.	
Geometric sequences	<a href="#">The Amazing Splitting Plant</a> Students look at how a plant splits each week to create more branches.  <b>Note</b>   This task provides an opportunity to discuss different approaches to solving a problem.	<a href="#">Visual Patterns</a> Students explore geometric sequences in patterns. Suggested patterns: #294, #192	<a href="#">Boing! Boing! Boing!</a> Looking at how the height of a bouncing ball decreases with each bounce. See pp. 30-31.
Arithmetic & Geometric Sequences	<a href="#">Which One Doesn't Belong?</a> Four increasing/decreasing patterns to describe and compare as students explain their reasoning.  <b>Note</b>   Students can identify arithmetic and geometric sequences in the examples.	<a href="#">Transformation Tables</a> Tasks to explore arithmetic and geometric sequences in grids using numerals and area of rectangles.	<a href="#">A Pattern With 4</a> Prompt to generate thinking and discussion about a decreasing pattern. Student suggestions can be explored and sorted as arithmetic and geometric if applicable.  <b>Note</b>   Manipulatives or visuals can be used to model student suggestions.

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Time Organizing Idea: Duration is described and quantified by time.				
Learning Outcome: Students communicate duration with standard units of time.				
Communicate duration with standard units	<a href="#">Approaching Midnight</a> An interactive strategy game that can be used to explore durations in 15-minute intervals and the relationship to the fractions of a circle.	<a href="#">All Aboard</a> A 3-Act Task to explore duration by calculating the amount of time for a train to pass.	<a href="#">The Wandering Cow</a> An exploratory problem involving the passing of time as it relates to minutes provided of a missing cow.	<a href="#">Bus A or Bus B</a> An exploratory task that challenges students to compare time in minutes and hours of two busses traveling the same distance.

Statistics Organizing Idea: The science of collecting, analyzing, visualizing, and interpreting data can inform understanding and decision making.					
Learning Outcome: Students evaluate the use of scale in graphical representations of data.					
Evaluating the use of scale in graphs	<a href="#">Going for Gold</a> The problem includes data that could be used to construct and interpret pictographs and bar graphs involving historical Olympic medal statistics/data.  <b>Note  </b> The graphs could be constructed using many-to-one correspondence.	<a href="#">How Big are Classes 5, 6, and 7?</a> Compare and interpret bar graph and pictograph. This question will strengthen student questioning in statistics/data collection.	<a href="#">Most Eaten Cereals</a> A slow reveal graph that starts with a graph that has been stripped of context: its numbers, its labels, its title. Students are encouraged to Notice and Wonder and make conjectures as additional aspects of the graph are revealed.  <b>Note  </b> Click on title or “slide deck” to access resource.	<a href="#">If the World Were a Village</a> Based on the book, <i>If the World Were a Village</i> , this problem includes visuals to explore data represented in multiple ways.  <b>Note  </b> There is an opportunity to discuss a many-to-one correspondence and large numbers (millions and billions).	<a href="#">One Through Ten</a> An interesting visual of Cuisenaire rods to engage students in a Data Talk. Students could create bar graphs or dot plots to show the number of factors for numbers 1-10.