

# Mathletics

## British Columbia Curriculum

### Mathematics



Grade 10

Mathletics

### Introduction

At Mathletics, we are committed to providing students, teachers and schools with high-quality learning resources that align with the most up-to-date curricula.

Our team of educational publishers has created a course that specifically follows the New British Columbia Curriculum. You can be assured that students have access to relevant and targeted content.

Mathletics courses consist of topics based on big ideas, content and elaborations.

When content is best addressed by teacher directed activities, it is indicated in this document. Such activities may be explored using the Mathletics online eBooks, videos and interactives or through our engaging rich learning tasks.

This document outlines the curriculum alignment and acts as a useful guide when using Mathletics in your school.



Engage



Target



Diagnose



Assess



Report



Fluency




Mobile

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#### MATHEMATICS — Foundations of Mathematics and Pre-Calculus Grade 10

##### Big Ideas

- Algebra allows us to **generalize** relationships through abstract thinking.
- The meanings of, and **connections** between, each operation extend to powers and polynomials.
- Constant rate of change is an essential attribute of linear **relations** and has meaning in different representations and contexts.
- Trigonometry involves using **proportional reasoning** to solve **indirect measurement** problems.
- Representing and analyzing **situations** allows us to notice and wonder about relationships.

Content	Elaborations	 Activities
Operations on <b>powers</b> with integral exponents	<ul style="list-style-type: none"> <li>positive and negative exponents</li> <li>exponent laws</li> <li>evaluation using order of operations</li> <li>numerical and variable bases</li> </ul>	Exponent Notation and Algebra Powers of integers Properties of Exponents Simplifying with Exponent Laws 1 Simplifying with Exponent Laws 2 Multiplication with Exponents Exponent Laws and Algebra Exponent Laws with Brackets Multiplication and Division with Exponents The Zero Exponent Zero Exponent and Algebra Integer Exponents Negative Exponents
<b>prime factorization</b>	<ul style="list-style-type: none"> <li>expressing prime factorization of a number using powers</li> <li>identifying the factors of a number</li> <li>includes greatest common factor (GCF) and least common multiple (LCM)</li> <li>strategies include using factor trees and factor pairs</li> </ul>	Factors Greatest Common Factor Least Common Multiple Find the Factor Prime Factoring Prime Factorization with Exponent Product of Prime Factors

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Content	Elaborations	Activities
<b>functions and relations:</b> connecting data, graphs, and situations	<ul style="list-style-type: none"> <li>communicating domain and range in both situational and non-situational contexts</li> <li>connecting graphs and context</li> <li>understanding the meaning of a function</li> <li>identifying whether a relation is a function</li> <li>using function notation</li> </ul>	Function Rules and Tables Find the Function Rule Function Notation 1 Function Notation 2 Vertical Line Test Domain Domain and Range Odd and Even Functions Piecemeal Functions What Type of Function? Identifying Graphs Conversion Graphs Linear Modelling Gradients for Real $y=ax$ Modelling Linear Relationships
<b>linear functions:</b> slope and equations of lines	<ul style="list-style-type: none"> <li>slope: positive, negative, zero, and undefined</li> <li>types of equations of lines (point-slope, slope intercept, and general)</li> <li>equations of parallel and perpendicular lines</li> <li>equations of horizontal and vertical lines</li> <li>connections between representations: graphs, tables, equations</li> </ul>	Reading Values from a Line Slope of a Line Gradient Are they Parallel? Are they Perpendicular? Equation from Point and Gradient Perpendicular and Parallel Lines Intercepts Equation from Two Points Equation of a Line 1 Equation of a Line 2 Equation of a Line 3 General Form of a Line Which Straight Line? Horizontal and Vertical Lines Table of Values Graphing from a Table of Values Graphing from a Table of Values 2 Determining a Rule for a Line

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Content	Elaborations	Activities
<b>arithmetic sequences</b>	<ul style="list-style-type: none"> <li>applying formal language (common difference, first term, general term) to increasing and decreasing linear patterns</li> <li>connecting to linear relations</li> <li>extension: exploring arithmetic series</li> </ul>	Increasing Patterns Decreasing Patterns Describing Patterns Table of Values Pattern Rules and Tables Find the Pattern Rule Number Plane Coordinate Graphs Horizontal and Vertical Change Graphing from a Table of Values Graphing from a Table of Values 2 Determining a Rule for a Line Extension: Linear Expressions for the nth term How many terms? Terms: Arithmetic Progressions Sum: Arithmetic Progressions
<b>systems of linear equations</b>	<ul style="list-style-type: none"> <li>solving graphically</li> <li>solving algebraically by inspection, substitution, elimination</li> <li>connecting ordered pair with meaning of an algebraic solution</li> <li>solving problems in situational contexts</li> </ul>	Solve Systems by Graphing Simultaneous Equations 1 Simultaneous Equations 2 Simultaneous Linear Equations Linear Modelling Breakeven Point
<b>multiplication of polynomial expressions</b>	<ul style="list-style-type: none"> <li>applying the distributive property between two polynomials, including trinomials</li> <li>connecting the product of binomials with an area model</li> </ul>	Expanding Brackets Expanding with Negatives Using the Distributive Property Expand then Simplify Expanding Binomial Products Special Binomial Products
<b>polynomial factoring</b>	<ul style="list-style-type: none"> <li>greatest common factor of a polynomial</li> <li>simpler cases involving trinomials (<math>y = x^2 + bx + c</math>) and difference of squares</li> </ul>	Highest Common Algebraic Factor Factoring Expressions Factoring Factoring with Negatives Factoring with Exponents Grouping in Pairs Factoring Quadratics 1 Factoring Quadratics 2 Monic Quadratic equations by factorizing Simplify Algebraic Fractions by Factoring Algebraic Fractions 3 Factoring and Fractions 1 Factoring and Fractions 2

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Content	Elaborations	Activities
primary <b>trigonometric</b> ratios	<ul style="list-style-type: none"> <li>sine, cosine, and tangent ratios</li> <li>right-triangle problems: determining missing sides and/or angles using trigonometric ratios and the Pythagorean theorem</li> <li>contexts involving direct and indirect measurement</li> </ul>	Pythagorean Theorem Pythagoras: Find a short side (decimals) Pythagorean Triads Hypotenuse, Adjacent, Opposite Sin A Cos A Tan A Find Unknown Sides Find Unknown Angles Trigonometry Problems 1 Trigonometry Problems 2 Elevation and Depression Bearings
<b>financial literacy:</b> gross and net pay	<ul style="list-style-type: none"> <li>types of income</li> <li>income tax and other deductions</li> </ul>	Wages and Salaries Special Allowances Piecework and Royalties Commission Working Overtime Bonuses and Leave Loading Deductions and Tax Installments Deductions and Net Pay Calculating Income Tax GST VAT Net Pay Budgeting

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### MATHEMATICS — Workplace Mathematics Grade 10

#### Big Ideas

- **Proportional reasoning** is used to make sense of **multiplicative** relationships.
- 3D objects can be examined mathematically by **measuring** directly and indirectly length, surface area, and volume.
- **Flexibility** with number builds meaning, understanding, and confidence.
- **Representing and analyzing data** allows us to notice and wonder about relationships.

Content	Elaborations	Activities
create, interpret, and critique <b>graphs</b>	<ul style="list-style-type: none"> <li>including a variety of formats, such as line, bar, and circle graphs, as well as histograms, pictographs, and infographics</li> </ul>	Line Plots Line Graphs: Interpretation Travel Graphs Step Graphs Bar Graphs 2 Graphs from Bills Divided Bar Graphs Sector Graphs Sector Graph Angles Sector Graph Calculations Creating a Sector Graph Conversion Graphs Picture Graphs: with scale & half symbols Making Picture Graphs: With Scale Tally Charts Histograms Frequency Histograms
<b>primary trigonometric ratios</b>	<ul style="list-style-type: none"> <li>single right-angle triangles; sine, cosine, and tangent</li> </ul>	Pythagorean Theorem Hypotenuse of a Right Triangle Pythagoras: Find a Short Side (integers only) Pythagorean Triads Hypotenuse, Adjacent, Opposite Sin A Cos A Tan A Find Unknown Sides Find Unknown Angles Trigonometry Problems 1 Trigonometry Problems 2 Elevation and Depression

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Content	Elaborations	Activities
metric and imperial measurement and <b>conversions</b>	<ul style="list-style-type: none"> <li>with a focus on length as a means to increase computational fluency</li> <li>using tools and appropriate units to measure with accuracy</li> </ul>	Measuring Length Scale Measurement Error in Measurement Converting Units of Length Kilometre Conversions Operations with Length Converting Rates Nautical Mile, Kilometre, Knot Converting Units of Area Converting Units of Mass Converting Volume Conversion Graphs
<b>surface area and volume</b>	<ul style="list-style-type: none"> <li>including prisms and cylinders, formula manipulation</li> <li>contextualized problems involving 3D shapes</li> </ul>	Nets Surface Area: Rectangular Prisms Surface Area: Cuboids Surface Area: Cylinders Surface Area: Triangular Prisms Field Diagrams Converting Volume Volume of solids and prisms - $1\text{cm}^3$ blocks Volume of Rectangular Prisms 1 Volume: Rectangular Prisms 2 Volume: Cuboid 2 Volume: Triangular Prisms Volume: Prisms Volume: Cylinders
<b>central tendency</b>	<ul style="list-style-type: none"> <li>analysis of measures and discussion of outliers</li> <li>calculation of mean, median, mode, and range</li> </ul>	Dot Plots Data Extremes and Range Mean Mean from Frequency Table Median Median from Frequency Table Mode Mode from Frequency Table Histograms Histograms for Grouped Data Stem and Leaf Plots with Range Median from Stem and Leaf Plot Mode from Stem and Leaf Plot Which Measure of Central Tendency?



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Content	Elaborations	Activities
<b>experimental probability</b>	<ul style="list-style-type: none"> <li>simulations through playing and creating games and connecting to theoretical probability where possible</li> </ul>	What are the Chances? Probability Scale Simple Probability Find the Probability Probability – 'And' and 'Or' Probability With Replacement Probability Without Replacement Two-way Table Probability Probability Tables Complementary Events Venn Diagrams Venn Diagram 1 Possible Outcomes Tree Diagram Tree Diagrams Dice and Coins Fair Games
<b>financial literacy:</b> gross and net pay	<ul style="list-style-type: none"> <li>types of income; income tax and other deductions</li> </ul>	Wages and Salaries Special Allowances Piecework and Royalties Commission Working Overtime Bonuses and Leave Loading Deductions and Tax Installments Deductions and Net Pay Calculating Income Tax GST VAT Net Pay Budgeting



For more information about Mathletics,  
contact our friendly team.

[www.mathletics.com/contact](http://www.mathletics.com/contact)



A 3P Learning Product