



## Course Outline: Grade 8 Mathematics

**Course Name:** Grade 8 Mathematics

**Course Code:** MAT8

**Credit Value:** None. Credits are not issued at the elementary level.

**Prerequisite:** None

**Curriculum Policy Document:** [The Ontario Curriculum: Grade 8 Mathematics](#)

**Course Developer:** Virtual Elementary School

**Department:** Intermediate

**Development Date:** 2020

### Overview

This course builds on the Grade 7 curriculum to further develop students' understanding of fundamental mathematical concepts by exploring topics related to number, coding, algebra, data, spatial sense, social emotional learning skills in mathematics, and financial literacy.

Throughout the course, students build their social emotional learning skills by specifically focusing on relationships with others, using math to communicate and tell a story, and understanding the perspectives of others. This increases their understanding of common bonds with peers and their appreciation of the uniqueness of other people.

Regarding numbers, students understand, represent and compare large and small numbers using scientific notation. Students use fractions, decimals, and percentages interchangeably and solidify their knowledge of square numbers and square roots of numbers up to 122. Students solve problems involving proportions, whole numbers, fractions, decimals, integers, and exponents.

In algebra, students extend their understanding of patterns to involve integers. They use algebraic notation to represent different equations. They solve algebraic equations involving multiple terms, integers, and decimal numbers. Students will increase their coding skills by writing code that uses data to inform decisions.

In data, students extend their data skills to analyze data that is presented in more complex ways. Students will compare the outcomes of more complex experiments to increase their understanding of probability.

In spatial sense, students study right-angle triangles and discover that if two side lengths are known, the length of the third can be calculated using the Pythagorean Theory. Students learn angle properties of intersecting and parallel lines to calculate unknown angles. In addition, students build their understanding of large and small units of measurement, including those used in technology.

In financial literacy, students learn to create and plan how to reach financial goals, including ways to maintain balanced budgets. Students learn about using reward programs or taking advantage of sales to

find different ways so they, as consumers, can obtain the greatest value for their money when spending. Students investigate the concepts of simple and compound interest using interest calculators and explain how interest affects long-term financial planning.

Through investigation of real-life problems, students develop a strong foundation of mathematical knowledge and skills. Students apply mathematical processes and build transferrable critical thinking skills in varied teaching and consolidation activities that appeal to diverse learning styles. Students participate in engaging storylines along with characters who connect their learning to real-world contexts and build confidence by instilling a positive attitude towards mathematics. Various opportunities consolidate students' learning through technology and offline activities, including tactile manipulatives, to reinforce essential mathematical strategies and tools. The course has a strong focus on reinforcing number sense and numeracy skills. It also provides various activities for practice throughout. This course prepares students for grade 9 mathematics.

## Resources Required

This course is entirely online and does not require nor rely on any textbook. Students will require the following resources:

- A scanner, smartphone camera, or similar device to digitize handwritten or hand-drawn work
- A smartphone camera or similar device to take pictures of student work
- A device to record audio
- A printer
- A physical binder, folder, or notebook for offline activities
- Calculator
- Protractor
- Compass
- Ruler with centimetres
- Various household items to complete offline activities

## Overall Curriculum Expectations

A. Social Emotional Learning Skills in Mathematics	<ul style="list-style-type: none"> <li>• A1. apply, to the best of their ability, a variety of social-emotional learning skills to support their use of the mathematical processes and their learning in connection with the expectations in the other five strands of the mathematics curriculum</li> </ul>
B. Number	<ul style="list-style-type: none"> <li>• B1. demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life</li> <li>• B2. use knowledge of numbers and operations to solve mathematical problems encountered in everyday life</li> </ul>
C. Algebra	<ul style="list-style-type: none"> <li>• C1. identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts</li> <li>• C2. demonstrate an understanding of variables, expressions, equalities, and inequalities and apply this understanding in various contexts</li> <li>• C3. solve problems and create computational representations of mathematical situations using coding concepts and skills</li> <li>• C4. apply the process of mathematical modelling to represent, analyse, make predictions and provide insight into real-life situations</li> </ul>
D. Data	<ul style="list-style-type: none"> <li>• D1. manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from life</li> </ul>

	<ul style="list-style-type: none"> <li>• D2. describe the likelihood that events will happen and use that information to make predictions</li> </ul>
E. Spatial Sense	<ul style="list-style-type: none"> <li>• E1. describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them</li> <li>• E2. compare, estimate, and determine measurements in various contexts</li> </ul>
F. Financial Literacy	<ul style="list-style-type: none"> <li>• F1. demonstrate the knowledge and skills needed to make informed financial decisions</li> </ul>

## Teaching and Learning Strategies

Through a balance of problem-solving and direct instruction, students develop a strong foundation in mathematical processes, knowledge, and skills and apply them in real-world contexts. The course engages multiple learning styles by combining technology and offline activities and by providing opportunities to develop an understanding of skills and concepts in interactive and concrete ways. The lessons feature a variety of intriguing storylines, videos, graphics, and interactive games to reinforce students' learning. The activities also build a foundation of mathematical models and strategies that students will use throughout the elementary grades.

The course relies on the assistance of a learning coach to support students as they move through the content. The learning coach will be involved in facilitating technical aspects of the course (e.g. printing and scanning printable activities) and participating in discussion-based activities to assist students in developing communication skills.

## Units

Representing Numbers	In the Representing Numbers unit, students learn how to represent large and small numbers including using scientific notation. Students also learn how to describe, compare, and order rational and irrational numbers.
Geometry	In the Geometry unit, students solve problems involving area, perimeter, circumference, area, volume, and angles. Students are introduced to the Pythagorean Theory as a way to find missing side lengths of right triangles. Students develop their understanding about scale drawings, transformations of shapes, and tessellation. Students also learn about large and small units of measurement.
Operations	In the Operations unit, students solve single-step, multi-step, and multi-operation problems involving rational numbers and percentages, and extend their knowledge to multiply and divide integers. Student develop mental math strategies to divide whole numbers and decimal numbers by powers of ten. In addition, students explore square numbers and square roots.
Fractions	In the Fractions unit, students extend their learning to add, subtract, divide, and multiply fractions and mixed numbers.
Proportional Reasoning	In the Proportional Reasoning unit, students solve single-step, multi-step, and multi-operation problems involving fractions, decimal numbers, ratios, rates, and percentages.
Data	In the Data unit, students extend their knowledge to represent, analyse, and describe relationships about data. Students also develop their understanding of probability.
Patterning and Algebra	In the Patterning and Algebra unit, students learn to determine the general term of a pattern using algebraic expression, create their own patterns, and describe them in

	different ways. Student solve algebraic equations in different ways and learn about inequalities represented with algebra.
Coding	In the Coding unit, students learn to read, create, alter, and debug code that involves data analysis and use that analysis to inform decisions.
Measurement	In the Measurement unit, students solve problems involving perimeter, circumference, area, surface area, and volume of 2D and 3D shapes.
Financial Literacy	In the Financial Literacy unit, students learn how to create and maintain a balanced budget to reach a financial goal. In addition, they analyse simple and compound interest, credit cards, and reward programs that give them the best value for their money.

## Reporting and The Final Grade (Facilitated)

### Reporting

Student achievement will be communicated formally to students via progress reports and official report cards. A progress report is provided after completion of the first unit in the course. The progress report is not an evaluation of the student's achievement. Rather, the report gives students and parents early and specific feedback regarding the student's general progress during the first unit of study.

Report cards are issued at the midterm point in the course and upon completion of the course. Each report card will focus on two distinct but related aspects of student achievement. First, the achievement of curriculum expectations and the course median are reported as percentages. The teacher will also provide written comments concerning the student's strengths, areas for improvement, and next steps. Second, the learning skills are reported as letter grades representing four levels of accomplishment.

Upon completion of a course, VES will send a copy of the report card to the student's home school (if in Ontario) where the course will be added to the ongoing list of courses on the student's Ontario Student Record (OSR). The report card will also be sent to the student's home address.

### The Final Grade

Student evaluation in this course is based on the student's achievement of curriculum expectations. The final percentage represents the quality of the student's overall fulfillment of the expectations for the course and reflects the corresponding level of achievement as described in the achievement chart for the discipline. The final grade reflects the student's most consistent level of achievement across all units in the course, although special consideration may be given to more recent evidence of achievement. Students are not required to write an exam or work on a final assessment in this course.

## Copyright

Copyright © by VirtualHighSchool.com Inc

**All rights reserved.** No part of this work covered by the copyright hereon may be reproduced, transcribed, or used in any form or by any means—graphic, electronic or mechanical, including photocopying, recording, taping, Web distribution, or information storage and retrieval systems—without the written permission of the publisher, VirtualHighSchool.com Inc.

For permission to use material from this course, contact us through our website, <http://www.virtualhighschool.com>

Every effort has been made to trace ownership of all copyrighted material and to secure permission from copyright holders. In the event of any question arising as to the use of any material, we will be pleased to make the necessary corrections as soon as we are informed.