



## Course Outline: Grade 7 Mathematics

**Course Name:** Grade 7 Mathematics

**Course Code:** MAT7

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

**Prerequisite:** None

**Curriculum Policy Document:** [The Ontario Curriculum: Grade 7 Mathematics](#)

**Course Developer:** Virtual Elementary School

**Department:** Intermediate

**Development Date:** 2020

### Overview

This course builds on the Grade 6 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 will be encouraged to build their social-emotional learning skills by specifically focusing on how to cope with stress and by managing complex challenges. Students learn to break down a task into smaller portions, make a plan, and work with it one step at a time.

Regarding numbers, students work with numbers up to 1 billion, rational numbers, squares numbers and square roots. Students learn key multiplication facts from  $0 \times 0$  to  $12 \times 12$ , begin to generate factors, work with multiples, and add and subtract fractions by using equivalent fractions. Students also develop their understanding of problems involving adding and subtracting integers.

In algebra, students extend their understanding of patterns in whole numbers and relate their understanding to patterns in decimals numbers. They solve equations involving multiple terms, whole numbers, and decimal numbers. Students learn to write code that executes a probability experiment.

In data, students learn how to use circle graphs to represent data. They begin to analyse data that is represented by potentially misleading graphs. Students also examine the differences between independent events and dependent events and their probabilities.

In spatial sense, students learn about the circumference, diameter, radius, and area of circles. They then extend this knowledge to find measurements for the surface area and volume of cylinders and other three-dimensional objects. Students also learn how to dilate a shape.

In financial literacy, students start learning about international currencies, exchange rates, and how various currencies differ in value from one another. Students are introduced to concepts of planning for and reaching financial goals. They also develop an understanding of how interest rates affect savings, investments, and borrowing, and they start to compare different types of accounts and loans.

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 8 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 real life</li> <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 areas</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 to apply in real-world contexts. The course engages multiple learning styles by combining technology and offline activities and by providing students with opportunities to develop their understanding of skills and concepts in interactive and concrete ways. The lessons feature a variety of intriguing storylines, videos, graphics, and interactive games that 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 who supports 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 in participating in discussion-based activities that assist students in developing communication skills.

## Units

Read, Represent, and Compare Numbers	In the Read, Represent, and Compare Numbers unit, students will learn to read, represent, and compare whole numbers, decimal numbers, and fractions. They will also learn about multiples and factors and how to determine them for whole numbers. Students will explore square numbers and square roots and learn how to add and subtract integers.
Geometry	In the Geometry unit, students will learn to describe and classify 3D figures, draw figures and shapes using different perspective views, and understand how shapes can be similar without being identical. They will also learn how to dilate a shape by drawing a version of the same shape that is larger or smaller but having the same proportions. In addition, students will transform shapes on a grid.
Operations	In the Operations unit, students will extend their knowledge to multiply and divide fractions and decimal numbers. They will solve multi-step problems involving both multiplication and division and start to use exponents to represent repeated multiplication.
Fractions	In the Fractions unit, students will add and subtract fractions, improper fractions, and mixed numbers, as well as learn how to simplify fractions.
Proportional Relationships	In the Proportional Relationships unit, students will learn to generate equivalencies among fractions, decimal numbers, and percentages. They will develop this skill to solve problems involving percentages of whole numbers and increasing and decreasing whole numbers by percent. In addition, students will solve problems involving unit rates.
Data	In the Data unit, students will learn ways to collect data, represent data, and convey messages using data in infographics. Students will also explore central tendency and

	the ways in which to determine the different types, as well as learning how to analyse data to make inferences and draw conclusions.
Patterning and Algebra	In the Patterning and Algebra unit, students will explore and compare number patterns in whole numbers and integers. They will also be introduced to algebraic expressions, monomials, and inequalities.
Coding	In the Coding unit, students will learn to read, write, alter, and debug code that is controlled by defined counts and uses sub-programs.
Measurement	In the Measurement unit, students will solve problems relating to perimeter, area, volume, capacity, and surface area. Students will also explore measurements of circles, such as their circumference and area. They will then be able to determine the surface area and volume of cylinders.
Financial Literacy	In the Financial Literacy unit, students will explore international currencies and compare their value to Canadian dollars and other currencies. They will explore how to plan for and reach a financial goal using budgeting, knowledge of the impact of interest rates, and fees associated with different types of accounts.

## 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 students complete the first unit in the course. The progress report is not an evaluation of the student achievement. Rather, the purpose of the report is to give 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 as well as 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 will be reported as percentages. The teacher will also provide written comments concerning the student's strengths, areas for improvement, and next steps.

Second, the student's learning skills will be 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 is given to more recent evidence of achievement. Students are not required to write a final exam in this course.

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