



## Course Outline: Grade 5 Mathematics

**Course Name:** Grade 5 Mathematics

**Course Code:** MAT5

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

**Prerequisite:** None

**Curriculum Policy Document:** [The Ontario Curriculum Grades 1-8: Mathematics, 2005 \(revised\)](#)

**Course Developer:** Virtual Elementary School

**Department:** Junior

**Development Date:** 2019

### Course Description

This course builds on the Grade 4 curriculum to further develop students' understanding of fundamental mathematical concepts by exploring topics related to number sense and numeration, measurement, geometry and spatial sense, patterning and algebra, and data management and probability. Students work with numbers up to 100 000, proper and improper fractions, and mixed numbers, and develop the concept of place value up to hundredths. Students count forward and backwards by 0.01, and build on addition, subtraction, multiplication, and division skills by solving problems with multiplication of whole digit numbers and solving problems with addition and subtraction of decimal numbers to hundredths. They also explore proportional reasoning by investigating whole-number rates. Through investigations, students measure and record perimeter, area, temperature change, and elapsed time. Students also determine the relationships among units and measureable attributes, specifically looking at the area of a rectangle and the volume of a rectangular prism. They identify and classify two-dimensional shapes by side and angle properties, compare and sort three-dimensional figures, and identify and construct nets of prisms and pyramids. Students identify and describe the location of an object using cardinal directions, and translate two-dimensional shapes. Furthermore, students investigate a table of values to determine relationships in growing and shrinking patterns, and investigate repeating patterns involving translations. Students demonstrate, through investigation, an understanding of the use of variables in equations. In addition, students collect and organize discrete or continuous primary and secondary data and display the data using charts and graphs. Students read, describe and interpret primary data and secondary data presenting in charts and graphs, and represent as a fraction the probability that an outcome will occur through a simple probability experiment, using systematic lists and area models. Throughout the course, students reinforce the mathematical processes of problem-solving, reasoning and proving, reflecting, selecting tools and computational strategies, connecting, representing, and communicating.

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 that connect their learning to

real-world contexts and build confidence through facilitating a positive attitude towards mathematics. Various opportunities are provided to consolidate student 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 and provides various activities for practice throughout. This course prepares students for Grade 6 mathematics.

### Resources Required by the Student

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

- A scanner, smart phone camera, or similar device to digitize handwritten or hand-drawn work
- A smart phone 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
- Various household items to complete offline activities

### Overall Curriculum Expectations

Strand	Overall Expectations
Number Sense and Numeration	<ul style="list-style-type: none"> <li>• Read, represent, compare, and order whole numbers to 100 000, decimal numbers to hundredths, proper and improper fractions, and mixed numbers.</li> <li>• Demonstrate an understanding of magnitude by counting forward and backwards by 0.01.</li> <li>• Solve problems involving the multiplication and division of multi-digit whole numbers, and involving the addition and subtraction of decimal numbers to hundredths, using a variety of strategies.</li> <li>• Demonstrate an understanding of proportional reasoning by investigating whole-number rates.</li> </ul>
Measurement	<ul style="list-style-type: none"> <li>• Estimate, measure, and record perimeter, area, temperature change, and elapsed time, using a variety of strategies.</li> <li>• Determine the relationships among units and measurable attributes, including the area of a rectangle and the volume of a rectangular prism.</li> </ul>
Geometry and Spatial Sense	<ul style="list-style-type: none"> <li>• Identify and classify two-dimensional shapes by side and angle properties, and compare and sort three-dimensional figures.</li> <li>• Identify and construct nets of prisms and pyramids.</li> <li>• Identify and describe the location of an object, using the cardinal directions, and translate two-dimensional shapes.</li> </ul>

Patterning and Algebra	<ul style="list-style-type: none"> <li>• Determine, through investigation using a table of values, relationships in growing and shrinking patterns, and investigate repeating patterns involving translations.</li> <li>• Demonstrate, through investigation, an understanding of the use of variables in equations.</li> </ul>
Data Management and Probability	<ul style="list-style-type: none"> <li>• Collect and organize discrete or continuous primary data and secondary data and display the data using charts and graphs, including broken-line graphs.</li> <li>• Read, describe, and interpret primary data and secondary data presented in charts and graphs, including broken-line graphs.</li> <li>• Represent as a fraction the probability that a specific outcome will occur in a simple probability experiment, using systematic lists and area models.</li> </ul>

### Teaching and Learning Strategies

Through a balance of problem-solving and direct instruction, students develop a strong foundation of mathematical processes, knowledge, and skills to apply in real-world contexts. The course utilizes a combination of technology and offline activities, providing opportunities to develop an understanding of skills and concepts in interactive and concrete ways and engage multiple learning styles. The lessons feature a variety of intriguing storylines, characters, videos, storybooks, 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 young students 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.

### Reporting (Facilitated Only)

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 purpose 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 is reported as a letter grade. Additionally, the course median is reported as a letter grade. 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.

## Units

Unit	Description
Numbers Up to 100 000	In the Numbers Up to 100 000 unit, students learn to read and write numbers up to 10 000, explore place value up to 100 000, and represent numbers up to 100 000. Students also compare and order whole numbers and solve problems up to 100 000.
Patterning	In the Patterning unit, students identify, extend and create geometric and numeric patterns, and build models from a table to show numeric patterns. Students make tables of values by adding or subtracting a rule in words and make a table of values for a pattern generated by multiplying or dividing. Students also make predictions related to growing and shrinking geometric and numeric patterns. Finally, students extend and create repeating patterns using translations.
Multiplication and Division	In the Multiplication and Division unit, students solve addition and subtraction problems, solve multiplication problems mentally, multiply two-digit numbers, and multiply decimal numbers by 10, 100, 1000, and 10 000. Students also investigate relationships involving whole number rates, divide with concrete materials and algorithms, and divide three-digit whole numbers with standard algorithms. Furthermore, students divide decimal numbers by 10 and 100, solve problems using division, develop an understanding that letters or symbols can be used to show unknown values, and use letters or symbols in equations involving simple rates. Students also find the missing number in addition, subtraction, multiplication, and division equations.
Geometry	In the Geometry unit, students identify and classify polygons as regular or irregular, identify acute, right, obtuse, and straight angles, and measure and construct angles up to $90^\circ$ . Students identify and classify triangles from their angle and side properties, construct triangles, and identify and classify three-dimensional figures including prisms, right prisms, and pyramids. Students also identify prisms and pyramids from nets and construct nets of prisms and pyramids. Furthermore, students locate an object using cardinal directions and a coordinate system, compare grid systems used on maps, identify, describe and perform translations, and create and analyse designs by translating and reflecting shapes.
Working with Decimal Numbers	In the Working with Decimal Numbers unit, students read and write decimal numbers, read and write money amounts to \$1000, explore place value of decimal numbers and represent, compare, and order decimal numbers. Students round decimal numbers to the nearest tenth, count forward by hundredths, and

	count backwards by hundredths. Students show equivalent decimal numbers, and add and subtract decimal numbers.
Fractions	In the Fractions unit, students represent proper and improper fractions, represent mixed numbers, convert improper fractions and mixed numbers, and show equivalent fractions. Students also compare proper and improper fractions, as well as compare and order fractions and mixed numbers. Furthermore, students explore equivalent fractions and decimal numbers and investigate the relationship between fractions and decimal numbers.
Data Management and Probability	In the Data Management and Probability unit, students develop an understanding of discrete and continuous data and data collection methods. Students explore samples of larger populations, collect and record data, organize data in charts, tables and graphs, as well as read, interpret, and draw conclusions from data. Students calculate the mean and use it to describe data and compare sets of data. To investigate probability, students explore possible outcomes in a probability experiment, represent probability using fractions, and perform a probability experiment.
Measurement	In the measurement unit, students estimate and measure the perimeter of polygons, find unknown side lengths, estimate and measure the area of polygons, and create 2D shapes with the same perimeter or area. Students find the perimeter and area of a rectangle, solve perimeter problems, and solve problems by estimating and calculating the area of rectangles, converting metres into centimetres, and converting kilometres into metres. Furthermore, students investigate measuring the mass of an object using the appropriate unit, find the volume of a rectangular prism, and determine the relationship between capacity and volume. Students also measure time and intervals with seconds and elapsed time, solve problems between 12- and 24-hour clocks, as well as measure, record, and represent temperature changes over time.

### The Final Grade (Facilitated Only)

The evaluation for this course is based on the student's achievement of curriculum expectations. The final letter grade 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 will be determined based on each of the 8 units (12.5% each) and will reflect the student's most consistent level of achievement throughout the course, although special consideration will be given to more recent evidence of achievement. There is no final assessment, such as an exam, in this course.