



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: Grade 5 Mathematics](#)

Course Developer: Virtual Elementary School

Department: Junior

Development Date: 2020

Overview

This course builds on the Grade 4 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 focusing specifically on their unique understandings and ways of interpreting problems. They will be encouraged to observe how other people solve problems and what they can learn from one another. Students will be given the tools and language to share their mathematical knowledge with others so they can work cooperatively to solve problems in a variety of different ways.

Regarding numbers, students will continue to expand their number sense and numeracy by working with numbers up to 100 000. Students will learn how to read, write, represent, compare, order, and solve problems using numbers up to 100 000. They will continue practicing multiplication and division problems by multiplying and dividing two, and three-digit numbers, and fractions. They will use mental math strategies to find solutions to addition and subtraction problems and will practice solving problems that involve more than one operation. While working with decimal numbers, students will practice reading, writing, representing, comparing, ordering, rounding, adding, and subtracting decimal numbers. They will do similar tasks with fractions, including comparing and ordering proper and improper fractions and mixed numbers. They will also be introduced to adding and subtracting fractions with like denominators.

In algebra, students will practice identifying, extending, creating, and predicting geometric growing, shrinking, and repeating patterns. They will also explore how to make a table of values and graph points on a coordinate plane in order to further explore relationships in patterns. They will also explore number patterns. Students will begin to write and solve algebraic expressions and equations and will practice their understanding of equivalent relationships and solving inequalities. While exploring coding, student will read, use, and alter conditional statements and other control structures to solve problems.

In data, students will continue to explore different data collection, sampling, and organization methods, as well as practice making use of mean, medians, and modes. In addition to making their own

infographics to represent data and tell a story, students will analyze data that has been presented in different formats. They will continue their experimentation, understanding, and theoretical knowledge of probability and probability experiments.

In spatial sense, students will continue their exploration of acute, right, obtuse, and straight angles in order to identify, measure, and construct different angles. Students will also identify, classify, and construct triangles and other shapes using a compass, protractor, and understanding of congruency. Students will draw objects from a variety of different perspectives, and describe and perform different translations. Using a variety of different units and real-world contexts, students will estimate, measure, create, solve, and convert measurement problems for area and perimeter. They will also continue to explore measurements of mass and capacity and how to select the best unit of measure for the task at hand.

In financial literacy, students will learn about the different methods of transferring money. They will estimate and calculate the cost of transactions and learn how to design and balance budgets. They will begin to develop an understanding of credit, debt, and tax and use unit rates to find the best value.

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 6 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
- A calculator, protractors, sticky notes, ruler, scissors, glue, dice, cards, coins, grid paper
- Dot paper
- Various household items to complete offline activities

Overall Curriculum Expectations

<p>A. Social Emotional Learning Skills in Mathematics</p>	<ul style="list-style-type: none"> • A1. Social-Emotional Learning (SEL) Skills and the Mathematical Processes: 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
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B. Number	<ul style="list-style-type: none"> • B1. Number Sense: demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life • B2. Operations use a knowledge of numbers and operations to solve mathematical problems encountered in everyday life
C. Algebra	<ul style="list-style-type: none"> • C1. Patterns and Relationships: identify, describe, extend, create, and make predictions about a variety of patterns, including those found in real-life contexts • C2. Equations and Inequalities: demonstrate an understanding of variables, expressions, equalities, and inequalities, and apply this understanding in various contexts • C3. Coding: solve problems and create computational representations of mathematical situations using coding concepts and skills • C4. Mathematical Modelling: apply the process of mathematical modelling to represent, analyse, make predictions, and provide insights into real-life situations
D. Data	<ul style="list-style-type: none"> • D1. Data Literacy: manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life • D2. Probability: describe the likelihood that events will happen and use that information to make predictions
E. Spatial Sense	<ul style="list-style-type: none"> • E1. Geometric and Spatial Reasoning: describe and represent shape, location, and movement by applying geometric properties and spatial relationships in order to navigate the world around them • E2. Measurement: compare, estimate, and determine measurements in various contexts
F. Financial Literacy	<ul style="list-style-type: none"> • F1. Money and Finances: demonstrate the knowledge and skills needed to make informed financial decisions

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 engages multiple learning styles by utilizing a combination of technology and offline activities to provide opportunities that 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 who supports students moving 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

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.
Multiplication and Division	In the Multiplication and Division unit, students solve addition and subtraction problems, multiply two-digit numbers, and solve multiplication whole numbers by 0.1 and 0.01 mentally. Students also investigate relationships involving whole number rates, divide with concrete materials and algorithms, and divide three-digit whole numbers with standard algorithms. Students also find the missing number in addition, subtraction, multiplication, and division equations.
Geometry	In the Geometry unit, students identify acute, right, obtuse, and straight angles, and measure and construct angles up to 180° . Students identify and classify triangles from their angle and side properties, and they construct triangles. Students identify and construct two-dimensional congruent shapes and draw objects from different views. Furthermore, students plot and read coordinates on a Cartesian plane and identify, describe, and perform transformations on a grid.
Working with Decimal Numbers	In the Working with Decimal Numbers unit, students explore place value of decimal numbers and represent, compare, and order decimal numbers. Students round decimal numbers to the nearest tenth. 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 and compare and order fractions and mixed numbers. Furthermore, students explore equivalent fractions and decimal numbers and investigate the relationship between fractions and decimal numbers. Students add and subtract fractions with like denominators. They multiply and divide whole numbers by fractions.
Patterning and Algebra	In this 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. Students extend and create repeating patterns using translation and explore patterns among whole numbers and decimals. Students explore equivalent relationships and evaluate algebraic expressions. They solve inequalities with whole numbers.
Coding	Students learn about conditional students and practice coding using them and other control structures. Students solve problems involving code, and read and alter code involving various control structures.
Data	In the Data unit, 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 create infographics to represent data. Students calculate the mean, median, and mode and use them 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 learn how to calculate the area of triangles and parallelograms. Students solve problems by converting metres into centimetres, and converting kilometres into metres. Furthermore, students investigate measuring the mass of an object using the appropriate unit.
Financial Literacy	In this unit, students describe how money can be transferred and estimate and calculate the cost of different transactions. Students learn how to design a budget and explore the concepts of credit and debt. Students learn how to use unit rates to find the best value and learn about tax and its applications.

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 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 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.

The Final Grade

Student evaluation in 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 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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