



North Vancouver Online Learning

Course Plan: Mathematics 8

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COURSE DESCRIPTION:

Mathematics 8 is a BC Provincial Mathematics course, offered in an online setting. The course follows the BC Provincial curriculum and satisfies the requirements for graduation. Mathematics 8 has been designed to develop deep mathematical understanding and fluency, logical reasoning, analytical thought, and creative thinking. There is a focus on concepts related to number sense, patterns and relations, spatial sense, and statistics and probability. For the complete Ministry Curriculum Math 10 FPC document, go to:

<https://curriculum.gov.bc.ca/curriculum/mathematics/8/core>

BIG IDEAS:

The Big Ideas consist of generalizations and principles and the key concepts important in an area of learning. They reflect the “Understand” component of the Know-Do-Understand model of learning. The big ideas represent what students will understand at the completion of the curriculum for their grade. They are intended to endure beyond a single grade and contribute to future understanding. Students will explore and understand the following five Big Ideas throughout the Mathematics 8 course:

Number represents, describes, and compares the quantities of ratios, rates, and percents.

Computational fluency and flexibility extend to operations with fractions.

Discrete linear relationships can be represented in many connected ways and used to identify and make generalizations.

The relationship between surface area and volume of 3D objects can be used to describe, measure, and compare spatial relationships.

Analyzing data by determining averages is one way to make sense of large data sets and enables us to compare and interpret.

CORE COMPETENCIES:

A Core Competency is a skill that all learners need to have to be successful in all aspects of their life. There are 3 core competencies: Communication (Communicating & Collaborating), Thinking (Critical Thinking, Creative Thinking), and Personal & Social (Positive Personal & Cultural Identity, Personal Awareness & Responsibility, and Social Responsibility).



COURSE EXPECTATIONS:

- The self-paced nature of the course demands that students manage their time effectively to complete the course by the deadline (June 1st or as determined by your program requirements). Successful students should engage in coursework for at least one hour each day.
- Students must successfully attempt all activities in the course in order to receive a passing grade, including unit quizzes, unit assignments, unit tests, review packages, performance tasks, reflections, the portfolio and the final exam.
- Students must pass a minimum of half of the Unit Tests in order to receive a passing grade in this course.
- The course material is run in Moodle, which is an interactive Learning Module System. This course teaches the material through interactive video lessons with complete detailed explanations to the content. Each lesson includes a note taking supplement, practice homework

and video solutions to the practice homework. All content, quizzes, review materials and additional studying resources are found in the course in Moodle.

- Students should take care that their communication with the instructor and with other students, through email, Moodle-messaging, and/or forums, is course related, clear in message and respectful in tone.
- This course is mainly to be completed by distance, although unit tests, midterm, and the final exam must be completed under the supervision of a Online Learning Teacher. Unit Tests must be completed at either the Mountainside or other North Vancouver District High School OL centers. Assignments and online quizzes may be completed at home.
- **Course work must be original; students are expected to complete their own work on an individual basis unless otherwise stated by the teacher. Any student who plagiarizes the work of another or does not do the work themselves, either in test situations or on major assignments, will face disciplinary action. This may range from receiving a zero on an assignment or test to disciplinary action by the administration.**

LEARNING STANDARDS: Curricular Competencies

Students are expected to be able to do the following:

Reasoning and analyzing

- Use [logic and patterns](#) to solve puzzles and play games
- Use [reasoning and logic](#) to explore, analyze, and apply mathematical ideas
- [Estimate reasonably](#)
- Demonstrate and [apply](#) mental math strategies
- Use tools or technology to explore and create patterns and relationships, and test conjectures
- [Model](#) mathematics in contextualized experiences

Understanding and solving

- Apply [multiple strategies](#) to solve problems in both abstract and contextualized situations
- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving
- Visualize to explore mathematical concepts
- Engage in problem-solving experiences that are [connected](#) to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures

Communicating and representing

- Use mathematical vocabulary and language to contribute to mathematical discussions
- [Explain and justify](#) mathematical ideas and decisions
- [Communicate](#) mathematical thinking in many ways
- Represent mathematical ideas in concrete, pictorial, and symbolic forms

Connecting and reflecting

- **Reflect** on mathematical thinking
- **Connect mathematical concepts** with each other, other areas, and personal interests
- Use mathematical arguments to support [personal choices](#)
- [Incorporate First Peoples](#) worldviews and perspectives to [make connections](#) to mathematical concepts

The Student Substantive Activities will cover the following **Learning Outcomes (Curricular Competencies)**.

- Demonstrate and [apply](#) mental math strategies
- [Explain and justify](#) mathematical ideas and decisions
- Represent mathematical ideas in concrete, pictorial, and symbolic forms

These are 3 of the 18 learning outcomes in the course curriculum, which comprises 16% of the course Learning Outcomes/Activities. (3/18 =16%)

LEARNING STANDARDS: Course Content

Students are expected to know the following:

- perfect square and cubes
- square and cube roots
- percents less than 1 and greater than 100 (decimal and fractional percents)
- numerical proportional reasoning (rates, ratio, proportion, and percent)
- operations with fractions (addition, subtraction, multiplication, division, and order of operations)
- discrete linear relations (extended to larger numbers, limited to integers)
- expressions – writing and evaluating using substitution
- two step equations with integer coefficient, constants, and solutions
- surface area & volume of regular solids, including triangular and other right prisms and cylinders
- Pythagorean Theorem
- constructions, views and nets of 3D objects
- central tendency
- theoretical probability with two independent events
- financial literacy – best buys

UNIT OVERVIEWS:

Unit 1: Number Concepts

Big Idea(s): *Computational fluency and flexibility extend to operations with fractions.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Number Concepts unit will focus on building the number or using prime factorization, identifying the factors of a number, determining greatest common factor (GCF) and least common multiple (LCM), as well as strategies including factor trees and pairs.

Unit 2 and 3: Operations Involving Integers & Working with Fractions

Big Idea(s): *Computational fluency and flexibility extend to operations with fractions.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Operations Working with Fractions & Involving Integers unit explores the use of brackets, but excludes exponents; using pattern blocks or Cuisenaire Rods, and simplifying expressions (e.g. $\frac{1}{2} \div \frac{9}{6} \times (7 - \frac{4}{5})$).

Unit 4: Square Roots, Cube Roots & Pythagorean

Big Idea(s): *Number represents, describes, and compares the quantities of ratios, rates and percents.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview:

The Square Roots, Cube Roots & Pythagorean Unit focuses on using colour tiles and pictures, finding cube roots, finding square roots, and estimating square roots. It will also explore modelling using the Pythagorean Theorem, finding the missing side of a right angle triangle, and deriving the Pythagorean Theorem.

Unit 5: Surface Area & Volume

Big Idea(s): *The relationship between surface area and volume of 3D objects can be used to describe, measure, and compare spatial relationships.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Trigonometry unit will explore strategies to determine surface area and volume of a regular solid using objects, a net or 3D design software, explore how volume = area of the base x height, as well as explore how surface area = sum of the areas of each side.

Unit 6: 3D Geometry

Big Idea(s): *The relationship between surface area and volume of 3D objects can be used to describe, measure, and compare spatial relationships.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The 3D Geometry unit will explore: top, front, and side views of 3D objects; matching a given net to the 3D object it represents; drawing and interpreting top, front, and side views of 3D objects; constructing 3D objects with nets; and using design software to create 3D objects from nets.

Unit 7: Solving Linear Equations

Big Idea(s): *Discrete linear relationships can be represented in many connected ways and used to identify and make generalizations.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Solving Linear Equations unit will focus on solving and verifying a given linear equation, modelling the preservation of equality (i.e. using algebra tiles, diagrams), using an expression to describe a relationship, as well as evaluating an expression given the value of a variable.

Unit 8: Linear Relations

Big Idea(s): *Discrete linear relationships can be represented in many connected ways and used to identify and make generalizations.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Linear Relations unit will explore: two variable discrete linear relations: expressions, table of values & graphs; scale values (tick marks on axes); four quadrants and integral coordinates.

Unit 9: Ratios, Rates & Proportions

Big Idea(s): *Number represents describes, and compares the quantities of ratios, rates, and percents.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Ratios, Rates & Proportions unit explores two-term and three-term ratios, real-life examples and problems. It also relates to financial literacy in terms of proportions, unit price, products/service and proportional reasoning strategies (e.g. unit rate, equivalent fractions given prices and quantities).

Unit 10: Understanding Percent

Big Idea(s): *Number represents describes, and compares the quantities of ratios, rates, and percents.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Understanding Percent unit focuses on determining % increase and decrease with respect to a worker's salary, number value associated with the % of a whole, and % population increases/decreases over time.

Unit 11: Data Analysis

Big Idea(s): *Analyzing data by determining averages is one way to make sense of large data sets and enables us to compare and interpret.*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Data Analysis Unit will explore measures of central tendency such as mean, median and mode.

Unit 12: Probability

Big Idea(s): *Analyzing data by determining averages is one way to make sense of large data sets and enables us to compare and interpret..*

Core Competency Focus: *Thinking*

First Peoples Principle of Learning: *Learning involves patience and time.*

Unit Overview: The Probability Unit explores two independent events, sample space, using tree diagrams/tables, and spinner and dice activities.

STUDENT LEARNING ACTIVITIES AND STRATEGIES:

- online lessons
- online practice homework
- paper-based unit assignments
- online lessons quizzes
- unit tests, midterm and final exam
- portfolio – collection of notes
- online and paper based review packages
- online games, activities and interactions
- reflective writing
- performance tasks (grasp tasks)

ASSESSMENT:

The course will include many formative assessment opportunities where students will receive teacher feedback and also have the opportunity to incorporate self-reflection and self-assessment tools. Summative assessment will be used on individual performance tasks that are incorporated in throughout the units. After each unit test, the teacher will provide feedback based on criteria and performance standards. The North Vancouver Curriculum Hub Principles of Assessment - <http://nvsc44curriculumhub.ca/assessment/>

Formative

- practice homework/video solutions, self-marking of unit assignments, online lesson quizzes, review exercises – checking for completion and understanding of lessons.
- Teacher/student appointments to discuss work and progress

Summative:

- unit assignments, unit tests, performance tasks, review packages, midterm & final exam, portfolio – written feedback, rubric assessment and grade

EVALUATION:

Based on performance standards and criteria as outlined in each assignment:

Assessment	Percentage of Final Mark
Unit Assignments	18%
Unit Tests	44%
Portfolio	12%
Unit Quizzes	12%
Midterm	7%
Final Exam	7%
GRASP Tasks (Note: to be included at a later date)	0%
Course Total	100%

RESOURCES:

The required readings and assignments are provided online for each lesson. Students must have access to a computer with internet capabilities, as well as to a functioning printer. The DL center at Mountainside is available for students who do not have computer/printer access at home or who would like to meet with the teacher for support. There is no textbook required.

NOTE: ***THERE IS NO LONGER A PROVINCIAL EXAM.** The *Course Final Exam* is still a **mandatory** component of this course.

As of January 2018, all students must take a **NUMERACY EXAM** at least ONE time during grades 10 – 12. The Numeracy Exam is not necessarily based on Math 10 FPC content, but rather based on foundational math skills.