Mathematics, Grade 9, De-streamed

Course Title: Mathematics
Course Code: MTH1W
Grade: 9
Course Type: De-streamed
Credit Value: 1.0
Prerequisites: None

Curriculum Document: [Mathematics, Grade 9](#)
Developed By: Sarah McKercher
Department: Mathematics
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Teacher(s):

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Course Description:

This course enables students to consolidate, and continue to develop, an understanding of mathematical concepts related to number sense and operations, algebra, measurement, geometry, data, probability, and financial literacy. Students will use mathematical processes, mathematical modelling, and coding to make sense of the mathematics they are learning and to apply their understanding to culturally responsive and relevant real-world situations. Students will continue to enhance their mathematical reasoning skills, including proportional reasoning, spatial reasoning, and algebraic reasoning, as they solve problems and communicate their thinking.

Unit Title and Description	Time Allocated
Numbers This course enables students to consolidate, and continue to develop, an understanding of mathematical concepts related to number sense and operations, algebra, measurement, geometry, data, probability, and financial literacy. Students will use mathematical processes, mathematical modelling, and coding to make sense of the mathematics they are learning and to apply their understanding to culturally responsive and relevant real-world situations. Students will continue to enhance their mathematical reasoning skills, including proportional reasoning, spatial reasoning, and algebraic reasoning, as they solve problems and communicate their thinking.	20 Hours
Algebra and Coding This unit will focus on setting the foundations for working with linear relationships. Students will investigate the properties of linear and non-linear relationships, the	29 Hours

different representations of linear relationships, and solve theoretical and application problems involving linear relationships. The unit will also connect algebraic concepts to coding applications. Students will read and write pseudocode, making use of comparative statements and loops, that produces solutions to real-life problems.	
Geometry and Measurement This unit explores variety of measurement systems and introduces the factor label method for converting between different unit types. Students will also investigate geometric relationships such as the volume differences between pyramids and prisms as well as cones and cylinders.	20 Hours
Data This unit will expand on the foundations of data collection and data analysis and build toward a project where students conduct a survey and analyze their data. Students will create a mathematical model for their data and test its validity.	23 Hours
Financial Literacy This unit will build on the idea of compound interest and students will learn about models of appreciation and depreciation in a Canadian context. Students will also learn methods to adapt a budget so that it continues to work under moderate changes in circumstances.	15 Hours
Final Assessment The final assessment for this course consists of a final project and final exam that together are worth 30% of a student's overall grade.	3 Hours

Overall Curriculum Expectations

Mathematical Thinking and Making Connections

1. apply the mathematical processes to develop a conceptual understanding of, and procedural fluency with, the mathematics they are learning;
2. make connections between mathematics and various knowledge systems, their lived experiences, and various real-life applications of mathematics, including careers

Numbers

1. demonstrate an understanding of the development and use of numbers, and make connections between sets of numbers
2. represent numbers in various ways, evaluate powers, and simplify expressions by using the relationships between powers and their exponents
3. apply an understanding of rational numbers, ratios, rates, percentages, and proportions, in various mathematical contexts, and to solve problems

Algebra

1. demonstrate an understanding of the development and use of algebraic concepts and of their connection to numbers, using various tools and representations
2. apply coding skills to represent mathematical concepts and relationships dynamically, and to solve problems, in algebra and across the other strands
3. represent and compare linear and non-linear relations that model real-life situations, and use these representations to make predictions
4. demonstrate an understanding of the characteristics of various representations of linear and non-linear relations, using tools, including coding when appropriate

Data

1. describe the collection and use of data, and represent and analyse data involving one and two variables
2. apply the process of mathematical modelling, using data and mathematical concepts from other strands, to represent, analyse, make predictions, and provide insight into real-life situations

Geometry and Measurement

1. demonstrate an understanding of the development and use of geometric and measurement relationships, and apply these relationships to solve problems, including problems involving real-life situations

Financial Literacy

1. demonstrate the knowledge and skills needed to make informed financial decisions

Resources Required:

This course is entirely online and does not require nor rely on any textbook. The materials required for the course are:

- A scanner, smart phone camera, or similar device to digitize handwritten or hand-drawn work,

- A non-programmable, non-graphing, scientific calculator.

- Spreadsheet software

- Word processing software

- Graphing software

Teaching and Learning Strategies:

The overriding aim of this course is to help students use the language of mathematics skillfully, confidently, and flexibly. A wide variety of instructional strategies are used to provide learning opportunities to accommodate a variety of learning styles, interests, and ability levels. The following mathematical processes are used throughout the course as strategies for teaching and learning the concepts presented:

- *Problem solving*: This course scaffolds learning by providing students with opportunities to review and activate prior knowledge, and build off of this knowledge to acquire new skills. The course guides students toward recognizing opportunities to apply knowledge they have gained to solve real-world mathematics problems relating to careers that require mathematics.
- *Activating*: This course scaffolds learning by providing students with opportunities to review and activate prior knowledge, and build off of this knowledge to acquire new skills. The course guides students toward recognizing opportunities to apply knowledge they have gained to solve real-world mathematics problems relating to careers that require mathematics.
- *Connecting*: The course activates prior knowledge when introducing a new concept in order to make a smooth connection between previous learning and new concepts, and introducing skills in context to make connections between particular manipulations and problems that require them.
- *Representing*: Through the use of examples, practice problems, and solution videos, the course models various ways to demonstrate understanding, poses questions that require students to use different representations as they are working at each level of conceptual development - concrete, visual or symbolic, and allows individual students the time they need to solidify their understanding at each conceptual stage.
- *Selecting Tools and Computational Strategies*: This course models the use of graphing software to help solve problems and to familiarize students with technologies that can help make solving problems faster and more accurate. Students will also investigate software used in a career that they are interested in, and describe how it relates to mathematics.
- *Connecting*: This course connects the concepts taught to real-world applications (e.g. concepts taught in geometry are related to careers in manufacturing). Students will have opportunities to connect previous concepts to new concepts through posed problems, investigations, and enrichment activities.
- *Self-Assessment*: Through the use of interactive activities (e.g. multiple choice quizzes, and drag-and-drop activities) students receive instantaneous feedback and are able to self-assess their understanding of concepts.

Assessment and Evaluation Strategies

Every student attending Christian Virtual School is unique. We believe each student must have the opportunities to achieve success according to their own interests, abilities, and goals. Like the Ministry of Education, we have defined high expectations and standards for graduation, while introducing a range of options that allow students to learn in ways that suit them best and enable them to earn their diplomas. Christian Virtual School's Assessment, Evaluation, and Reporting Policy is based on seven fundamental principles, as outlined in the Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools document.

When these seven principles are fully understood and observed by all teachers, they guide the collection of meaningful information that helps inform instructional decisions, promote student engagement, and improve student learning. At Christian Virtual School, teachers use practices and procedures that:

- are fair, transparent, and equitable for all students;
- support all students, including those with special education needs, those who are learning English, and those who are First Nation, Métis, or Inuit;
- are carefully planned to relate to the curriculum expectations and learning goals and, as much as possible, to the interests, learning styles and preferences, needs, and experiences of all students;
- are communicated clearly to students and parents or guardians at the beginning of the school year or course and at other appropriate points throughout the school year or course;
- are ongoing, varied in nature, and administered over a period of time to provide multiple opportunities for students to demonstrate the full range of their learning;
- provide ongoing descriptive feedback that is clear, specific, meaningful, and timely to support improved learning and achievement; and
- develop students' self-assessment skills to enable them to access their own learning, set specific goals, and plan next steps for their learning.

For more information on Christian Virtual School's assessment and evaluation strategies, you can refer to our [Assessment, Evaluation, and Reporting Policy](#).

Program Planning Considerations

Each of our courses have been designed by a team of educators to create an environment infused with creativity, flexibility, choice, and variety, with the goal to help every student succeed. We also take into consideration several topics that span disciplines and ensure we incorporate these into each of our courses.

Program Planning Considerations
Students with Special Needs
Christian Virtual School is committed to ensuring that all students are provided with the learning opportunities and supports they require to succeed. Our courses are made to offer flexible, personalized learning experiences. By maintaining an asynchronous model, students can move through their courses at their own pace, ensuring they are able to take the time they need to understand concepts or work with their teacher if they hit roadblocks. Christian Virtual School courses also incorporate choice, allowing students to submit work in a variety of mediums or formats to communicate their ideas.
In addition to the flexibility built into the courses, Christian Virtual School will implement the accommodations that are listed in a student's Individual Education Plan (IEP) that are applicable to the online learning environment. In these cases, the learning expectations will be the same as or similar to the expectations outlined in the curriculum document but supports will be provided to help students achieve those expectations. Common accommodations in the environment are reducing the workload, simplifying tasks and materials, providing extra time for tests and exams, allowing scribing or the use of specialized equipment, and not deducting marks for spelling.
English Language Learners
Although all our courses are only offered in English at this time, Christian Virtual School welcomes students learning the English language. Students do need to meet a baseline proficiency level to access

the content, but Christian Virtual School teachers are responsible for helping students develop their English literacy skills no matter the course they are enrolled in.

Upon enrollment, students are asked if they would like to provide information about their English language background, and this information is used by our teachers to help them adjust their instruction and suggest accommodations within the courses. English language learners are encouraged to reach out to their teacher or the Christian Virtual School administration to talk about the accommodation options in their courses so that the appropriate opportunities are given to everyone.

Environmental Education

Christian Virtual School operates with 5 cores values: responsibility, perseverance, integrity, compassion, and community. These core values determine our business operations, as well as exemplify what we, as educations, want to instill in our students. Environmental education, among other causes, are important to us as a school and we strive to promote learning about these issues and solutions within our courses. We work to educate students on the environment, its threats, and the importance of sustainability. We also work to inspire students to make an impact within their community and identify an alignment between their passions and the local, or global, needs.

Environmental education is woven throughout our course content, across all disciplines. Depending on the course and subject matter, this education can be subtle or explicit, but the goal is to ensure that students have the opportunity to acquire the knowledge, skills, perspective and practices needed to become an environmentally literate citizen.

Equity and Inclusive Education

Christian Virtual School stands on the belief that every person is unique and, regardless of ancestry, culture, ethnicity, sex, physical or intellectual ability, race, religion, sexual orientation, socio-economic status, or other similar factor, they are to be welcomed, included, accepted, treated fairly, and respected. As a school, we teach students about multiple worldviews, how to identify and acknowledge similarities and differences, and how to communicate with others in an inclusive, kind, loving, and compassionate way.

Diversity is valued at Christian Virtual School, and it is our goal to ensure all members of the community feel safe, comfortable, and accepted. Our courses are written to draw attention to the contributions of men and woman alike, the different perspectives of various cultural, religious, and racial communities, and the beliefs and practices of First Nations, Métis, and Inuit peoples, to showcase a wide range of backgrounds and allow all of our students to see themselves reflected in the curriculum.

As a school, we see and recognize the diversity of families, children, and people in the world in need of Christ's love. We work every day to spread the love and acceptance of Christ.

Financial Literacy Education

Whenever possible, Christian Virtual School emphasizes the importance of financial literacy. Making financial decisions has become an increasingly complex task, and students need to have knowledge in many areas and a wide range of skills in order to make informed decisions about financial matters. In addition to the concrete skills of numeracy and finances from a mathematical point of view, students need to develop an understanding of the economic forces and ways in which they can respond to those influences.

Lessons that promote skill building in problem solving, inquiry, research, decision making, reflection, and critical thinking are present throughout Christian Virtual School courses. The goal is to help students acquire the knowledge and skills required to understand their own finances, as well as to develop an understanding of local and global effects of world economic forces and the social, environmental, and ethical implications of their own choices.

The Role of Information and Communication Technology

Technology is rapidly changing, and the requirements for literacy in technology is growing just as quickly. Students entering the workforce are expected to have a firm grasp of information and communication technologies and be skilled their use.

Due to the nature of Christian Virtual School courses, students are exposed to a wide range of technologies to both facilitate and communicate their learning. As a result, students will develop transferable skills through their experience with word processing, information processing, internet research, presentation software, communication tools, and more.

Career Education

Opportunities are present throughout Christian Virtual School courses to explore careers related to the different disciplines and subject areas. Students are exposed to a wide variety of modern careers, fields of study, and employment opportunities.

In addition, teachers are available to help the student prepare for employment in a number of diverse areas. With the help of teachers, students will learn to set and achieve goals and gain experience in making meaningful decisions concerning career choices. The skills, knowledge, and creativity that students acquire through our course are essential for a wide range of careers.

Health and Safety

In order to provide a suitable learning environment for the Christian Virtual School staff and students, it is critical that the courses and the learning environment complies with relevant federal, provincial, and municipal health and safety legislation and by-laws, including, but not limited to, the Workplace Safety and Insurance Act, the Workplace Hazardous Materials Information System (WHMIS), the Food and Drug Act, the Health Protection and Promotion Act, the Ontario Building Code, and the Occupational Health and Safety Act (OHSA).

Consideration of students' health and safety is taken when planning activities, investigations, and experiments for our courses to ensure that proper safety precautions are communicated to and attainable for students.