

## Science, Grade 10, Academic

**Course Title:** Science

**Course Code:** SNC2D

**Grade:** 10

**Course Type:** Academic

**Credit Value:** 1.0

**Prerequisites:** SNC1D or SNC1W

**Curriculum Document:** [Science, Revised \(2008\)](#)

**Course Developer:** Sarah Kreick

**Department:** Science

**Development Date:** September 2021

**Most Recent Revision Date:** September 2021

**Teacher(s):**

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### Course Description:

This course enables students to enhance their understanding of concepts in Earth and Space science, Biology, Chemistry, and Physics, and of the interrelationships between science, technology, society, and the environment. Students are given opportunities to further develop their scientific investigation skills. Students will plan and conduct investigations and develop their understanding of scientific theories related to the connections between forces that affect climate and climate change; cells and systems in animals and plants; chemical reactions, including acid/base reactions; and the interaction of light and matter.

Unit Title and Description	Time Allocated
<p><b>Earth and Space: Climate Change</b></p> <p>Students will demonstrate an understanding that Earth's climate is dynamic and is the result of interacting systems and processes. They will explore how global climate change is influenced by both natural and human factors. Students will also investigate the variety of ways climate change affects living things and natural systems. Finally, they will assess the impact of human activity on climate change and to identify effective courses of action to reduce this impact.</p>	27 Hours
<p><b>Biology: Tissues, Organs, and Systems of Living Things</b></p> <p>Students will demonstrate an understanding of the ways in which plants and animals, including humans, are made of specialized cells, tissues, and organs that are</p>	27 Hours

organized into systems. They will also evaluate the social and ethical implications of developments in medicine and medical technology.	
<p><b>Chemistry: Chemical Reactions</b></p> <p>Students will demonstrate an understanding of the predictable ways in which chemicals react. They will explore evidences of chemical reactions and ways to identify acids and bases. Students will also explore how chemical reactions may have a negative impact on the environment, but that they can also be used to address environmental challenges.</p>	27 Hours
<p><b>Physics: Light and Geometric Optics</b></p> <p>Students will demonstrate an understanding of the characteristics and properties of light that can be manipulated with mirrors and lenses for a range of uses. They will also explore the ways in which society has benefited from the development of a range of optical devices and technologies.</p>	27 Hours
<p><b>Final Assessment</b></p> <p>The final assessment in this course consists of an exam worth 30% of a student's final grade.</p>	2 Hours

### Overall Curriculum Expectations

#### Scientific Investigation Skills and Career Exploration

1. demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating);
2. identify and describe a variety of careers related to the fields of science under study, and identify scientists, including Canadians, who have made contributions to those fields.

#### Biology: Tissues, Organs, and Systems of Living Things

1. evaluate the importance of medical and other technological developments related to systems biology, and analyse their societal and ethical implications;
2. investigate cell division, cell specialization, organs, and systems in animals and plants, using research and inquiry skills, including various laboratory techniques;
3. demonstrate an understanding of the hierarchical organization of cells, from tissues, to organs, to systems in animals and plants.

#### Chemistry: Chemical Reactions

1. analyse a variety of safety and environmental issues associated with chemical reactions, including the ways in which chemical reactions can be applied to address environmental challenges;
2. investigate, through inquiry, the characteristics of chemical reactions;
3. demonstrate an understanding of the general principles of chemical reactions, and various ways to represent them.

### **Earth and Space Science: Climate Change**

1. analyse some of the effects of climate change around the world, and assess the effectiveness of initiatives that attempt to address the issue of climate change;
2. investigate various natural and human factors that influence Earth's climate and climate change;
3. demonstrate an understanding of natural and human factors, including the greenhouse effect, that influence Earth's climate and contribute to climate change.

### **Physics: Light and Geometric Optics**

1. evaluate the effectiveness of technological devices and procedures designed to make use of light, and assess their social benefits;
2. investigate, through inquiry, the properties of light, and predict its behaviour, particularly with respect to reflection in plane and curved mirrors and refraction in converging lenses;
3. demonstrate an understanding of various characteristics and properties of light, particularly with respect to reflection in mirrors and reflection and refraction in lenses.

### **Resources Required:**

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

- A smart phone, camera, or similar device to record video and sound,
- A scanner, smart phone camera, or similar device to upload handwritten or hand-drawn work,
- Online access to third party software.

### **Teaching and Learning Strategies:**

Teaching and learning strategies assist both teachers and students in achieving specific learning objectives. A number of methods have been used to create an online learning environment that will engage students in a variety of ways and support their understanding of scientific concepts. These strategies may include:

- Clearly described unit expectations
- Hands-on lab activities
- Virtual lab activities
- Virtual field trips
- Animations and simulations
- Creative problem solving

- Case Studies
- Assessment FOR learning activities
- Student reflection and self-assessment
- Discussions of issues relating science to technology, society, and the environment
- Research Reports
- Opinion-based Reports
- Concept-supporting games
- Model building
- Field observations

### **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 core values: responsibility, perseverance, integrity, compassion, and community. These core values determine our business operations, as well as exemplify what we, as educators, 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.