

Course Outline

School Name: Keewaytinook Internet High School
Department Name: Science

Ministry of Education Course Title: Science

Grade Level: 9

Ministry Course Code: SNC1L

Teacher's Name: Cathy Rodger

Developed by: Cathy Rodger Date: Sept 2015

Revision Date: September 2015

Developed from: Locally Developed Compulsory Credit Courses -2005

Text: Science Power 9, McGraw-Hill Ryerson, 1999

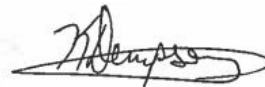
Prerequisite: none

Credits: 1

Length: 110 hours

Principal's Name: Kevin Dempsey

Principal's Approval (signature)



Approval Date: September 21, 2015

Course Description/rationale

This course emphasizes reinforcing and strengthening science-related knowledge and skills, including scientific inquiry, critical thinking, and the relationship between science, society, and the environment, to prepare students for success in everyday life and the workplace. The students may proceed from this course to a Grade 9 Science Applied or Academic course, or a Grade 10 optional Locally Developed course as a stepping stone to the Science Grade11 Workplace course.

Students explore a range of topics, including science in daily life, properties of common materials, life-sustaining processes in simple and complex organisms, and electrical circuits.

Students have the opportunity to extend mathematical and scientific process skills and to continue to develop their skills in reading, writing and oral language through relevant and practical scientific activities.

Overall Curriculum Expectations

Scientific Inquiry: Science in Daily Life

- Illustrate how science is a part of daily life.
- Use appropriate scientific skills, tools, and safety procedures to investigate problems.
- Examine the connections between science and activities in daily life.

Chemistry: Properties of Common Materials

- Explain the characteristics and classification of common materials, using appropriate scientific terminology.
- Investigate the physical and chemical properties of common materials through laboratory activities.
- Analyze how the use of various materials is based on their physical and chemical properties.

Biology: Staying Alive

- Explain the systems and processes required by simple and complex organisms to sustain life.
- Investigate, through laboratory and field activities, the processes which simple and complex organisms use to sustain life.
- Analyze how personal health and safety in everyday life and in the workplace are protected through the proper use of equipment and safety practices.

Physics: Electrical Circuits

- Describe the characteristics of electrical circuits.
- Investigate simple electrical circuits, using safe practices.
- Analyze the practical uses of electrical circuits and their impact on daily life.

Course Content:

Unit	Length
Science Inquiry: Science in Daily Life	15 hours
Biology: Staying Alive	25 hours
Physics: Electrical Circuits	25 hours
Chemistry: Properties of Common Materials	25 hours
Making Personal Decisions	20 hours
Total	110 hours

Unit Descriptions

Unit 1 Science Inquiry: Science in Daily Life.

Through study of science and its processes, students can acquire a valuable perspective on the workplace and everyday life. They use critical thinking and inquiry skills that include generating questions and being able to answer those questions experimentally with an understanding of the factors that might affect experimental results; the concept of a fair test. In addition, students learn to use common laboratory tools appropriately and safely and to make connections with how tools used in science are also used in daily life.

As students perform two simple experiments, they analyze the factors that affect the results of the experiments, change one factor, and observe the changes in the results. Students are introduced to a discrepant event, for which they brainstorm and analyze questions as: testable by experiment, answerable by research, or not answerable scientifically. They further analyze the testable questions for practicality. Students are introduced to General Lab Safety Rules. Students devise a fair test method of comparing the bouncibility of a variety of sports balls and write a procedure for their method. They collect results and create bar graphs, which they use to discuss the materials and uses of the particular balls. They write a paragraph on the connection of science to everyday life.

Unit 2 – Biology : Staying Alive

This unit connects life-sustaining processes and systems to procedures important for personal safety in the workplace, the home, and everyday life. The skill emphasis is on the development of testable questions.

Students review the concept of life-sustaining processes while reinforcing the skills of observation, data collection, and communication. They pose questions and investigate simple life processes. Students expand their knowledge of the structures and systems required for these life-sustaining processes. The activities, including a safe dissection or simulation, build on an understanding that structures work together in organized systems to support life. Students connect this understanding to their personal lives and future work experiences. They identify the characteristics of a safe workplace and choose personal protective equipment appropriately. They build on Essential Skills needed in the workplace: document use, finding information, and decision making

Unit 3 –Physics: Electrical Circuits.

Students are made aware of the practical uses of electrical circuits in their daily lives. They develop an understanding of current electricity and the role it plays in everyday life. The scientific skill emphasis is on gathering, organizing, and working with qualitative and quantitative data.

Students investigate how the components of circuits work together and build simple circuits that model everyday circuits. They collect data as they measure current and potential difference in various circuits and relate this understanding to everyday electrical devices in circuits. Using a variety of household and workplace devices, they develop a logical checklist for troubleshooting electrical devices.

Safety, experimentation, literacy, and collaboration are integral components of the activities. Students build on the following Essential Skills needed in the workplace: oral and written communication; document use; and thinking skills, including problem solving and decision making.

Unit 4 -- Chemistry: Properties of Common Materials.

Students are made aware that both hazardous and nonhazardous materials surround them in their home, school, and workplace environments and that making decisions about the safe use, handling, and disposal of these materials is an important life skill. The skill emphasis is on inquiry, drawing conclusions, and making decisions based on data. Students develop an understanding of the importance of Household Hazardous Product symbols (HHPs) and Workplace Hazardous Materials Information System (WHMIS)symbols and of following safe procedures when handling common materials.

By designing and conducting laboratory investigations, they gain an understanding of the physical and chemical properties of various common materials and decide on how they can refine their investigation. Students plan and conduct a safe investigation of two similar materials and recommend the best material for a specified purpose based on its physical and chemical properties. Students practice and refine their literacy

and communication skills. The Essential Skills needed in the workplace are problem solving, decision making, and writing.

Unit 5: Making Personal Decisions.

Students demonstrate the laboratory and technical inquiry skills, communication skills, and the concept of “fair test” that they developed throughout the course. By investigating a personally chosen topic, students collect qualitative and quantitative data through scientific investigations, research a product of their choice, and provide a recommendation for choosing a product.

Students use existing product comparisons to review questioning skills for decision making. They submit a proposal outlining the questions they plan to test and focus on the design of the personal investigation. Students carry out their investigation, evaluate and refine their investigation, and make recommendations. They summarize their investigations and recommendations in a report. Throughout the process, they self-assess and receive teacher and peer feedback to improve their final product.

Teaching/Learning Strategies

- Retelling
- Peer Teaching
- Demonstration
- Textbook
- Worksheets
- Inquiry Process
- Scientific Method
- Sketching to Learn
- Discussion
- Read Along
- Visual Stimuli
- Reports
- Mathematical Problem Solving
- Writing Process
- Mentoring
- Advance Organizer
- Read Aloud
- Visualization
- Decision Making Models

Evaluation

The final grade will be determined as follows:

- Seventy per cent of the grade will be based on evaluation conducted throughout the course. This portion of the grade should reflect the student’s most consistent level of achievement throughout the course, although special consideration should be given to more recent evidence of achievement.
- Thirty per cent of the grade will be based on a final evaluation administered at or towards the end of the course. This evaluation will be based on evidence from one or a combination of the following: an examination, a performance, an essay, and/or another method of evaluation suitable to the course content. The final evaluation allows the student an opportunity to demonstrate comprehensive achievement of the overall expectations for the course.

Growing Success: Assessment, Evaluation and Reporting in Ontario Schools. Ontario Ministry of Education Publication, 2010 p.41

Type of assessment	Category	Details	Weighting (%)
Term Work (70%)	Knowledge/ Understanding	<ul style="list-style-type: none"> - Illustrate how science is a part of daily life. - Explain the characteristics and classification of common materials, using appropriate scientific terminology. - Explain the systems and processes required by simple and complex organisms to sustain life. - Describe the characteristics of electrical circuits. 	18%

	Thinking /Inquiry	- Use appropriate scientific skills, tools, and safety procedures to investigate problems. - Investigate the physical and chemical properties of common materials through laboratory activities. - Investigate, through laboratory activities, the processes which simple and complex organisms use to sustain life. - Investigate simple electrical circuits, using safe practices.		14%
	Communi- cation	- Communication of information and ideas. - Use of scientific terminology, symbols, conventions and standard (SI) units. - Use of various forms of communication. - Use of information technology for scientific purposes.		19%
	Making Connections	- Understanding connections among science, technology, society and the environment. - Analysis of social and economic issues involving science and technology. - Assessment of impacts of science and technology on the environment. - Proposing courses of practical action in relation to science- and technology-based problems.		19%
Final Assessment (30%)	Culminating Activity (15%)	The cumulative activity is made up of two parts where all of the skills learned throughout the course will be demonstrated.	K/U	5%
			T/I	4%
			C	6%
			A	5%
	Final Examination (15%)	The final exam consists of a series of short problems and scenarios where the students will be able to use the skills and knowledge gained in the course.	K/U	2.5%
			T/I	2%
			C	3%
			A	2.5%
TOTAL				100%

Assessment/Evaluation Strategies

- Tests
- Short Questions
- Diagram
- Concept maps and other graphic organizers
- Exam
- Essay
- Creating graphs and tables
- Performance Task
- Select Response
- Reports
- Letters

Resources

Print Resources:

- Wolfe, E., Clancy, C., Jasper, G., Lindenberg, D., Lynn, D., Mustoe., F., & Smythe, R. (1999). *Science Power 9*. Whitby, ON: McGraw-Hill Ryerson.
- *Growing Success: Assessment, Evaluation and Reporting in Ontario Schools*. (2010). Toronto, ON: Queen's Printer for Ontario.

Internet Resources:

- Association for the Advancement of Science www.aaas.org/
- Product Review and Reports <http://www.consumersearch.com/>
- Canadian Space Agency Resource Centre <http://www.asc-csa.gc.ca/eng/>
- About Chemistry www.chemistry.about.com
- Explore Learning www.explorelearning.com
- How Stuff Works www.howstuffworks.com

Program Planning

This version of SNC1L is offered to students living in isolated communities who do not have access to normal high school facilities, equipment or teachers associated with secondary education. The course uses Internet connectivity for most instruction and feedback. It utilizes a student centered semi-virtual classroom which capitalizes on the strengths of internet program delivery to minimize the disadvantages of geographic remoteness. The student attends school in full days similar to traditional face-to face programming. The classroom is similar to a computer classroom with a student to computer ratio of 1:1.

The program may be altered based on specific student interests, techniques or resources that proved successful in a previous unit. As much effort as possible will be made to integrate community concerns and interest in the curriculum. Open discussion is encouraged – in fact, it can be used to assess communication skills.