

Course Outline

School Name: Keewaytinook Internet High School

Department Name: Science

Ministry of Education Course Title: Science

Grade Level: 10

Ministry Course Code: SNC2L

Teacher's Name: Mike Dool

Developed by: Mike Dool **Date:** December 2009

Revision Date:

Developed from: The Ontario Curriculum Grade 9 and 10 Science, 1999

Profile Name: Locally Developed Compulsory Credit Course, Course Profile, Science Grade 10, 2005

Text: Science 10, Nelson, 2001.

Prerequisite: SNC1L

Credits: 1

Length: 110 hours

Principal's Name: Darrin Potter

Principal's Approval (signature) _____

Approval Date:

Course Description/rationale

This course emphasizes reinforcing and strengthening science-related knowledge and skills, including scientific inquiry, critical thinking, and the environmental impact of science and technology, to prepare students for success in everyday life, in the workplace, and in the Grade 11 Science Workplace Preparation course.

Students explore a range of topics, including science in media, interactions of common materials, interdependence of organisms in communities, and using electrical energy.

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

Overall Curriculum Expectations

Scientific Inquiry: Science in Media

- explain how science-related information is presented in print and electronic media for different purposes and audiences;
- investigate science-related information presented in print and electronic media using appropriate research and reporting skills;
- evaluate claims and presentations of science-related information in media.

Chemistry: Interactions of Common Materials

- understand how chemicals in common household and workplace materials interact;
- investigate the types and rates of interactions between commonly used materials through laboratory activities;
- analyze how material interactions affect our daily lives.

Biology: Living Together

- explain the strategies that organisms use for successful coexistence in populations and communities;
- investigate, using appropriate laboratory and research skills, the implications of organisms existing in communities;
- analyze the challenges that arise from organisms living in communities.

Physics: Using Electrical Energy

- explain the generation, measurement, and conversion of electricity;
- investigate the factors that affect the generation and use of electricity;
- analyze the social, economic, and/or environmental implications of the sources and uses of electrical energy.

Course Content:

Unit	Length
Science Inquiry: Science in the Media	12 hours
Biology: Living Together	26 hours
Chemistry: Interactions of Common Materials	26 hours
Physics: Using Electrical Energy	26 hours
Community Action Plan	20 hours
Total	110 hours

Unit Descriptions

Unit 1 Science Inquiry: Science in the Media

Scientific literacy is critical for students in an increasingly technological and scientific world. Students are bombarded with science-based claims and a solid base of scientific inquiry skills enables them to distinguish between fact and opinion and to understand media bias in order to make informed decisions. Students are exposed to a variety of opinions and messages.

The scientific inquiry and critical thinking skills developed in this unit are revisited throughout the course and ensure students prepare for success in the final unit evaluation. Media and scientific literacy are emphasized throughout the unit, enabling students to question the presentation of science information in the media.

Students focus on reviewing the laboratory and investigation skills required to evaluate science-based claims through experimental research. Students examine various modes of science-related media and learn to analyze media for the messages portrayed and then investigate a science-related issue through media-based research. Throughout the unit, they practice the Essential Skills of reading text, document use, numeracy, oral communication, computer use, decision making, and working with others.

Unit 2 – Biology : Living Together

Living in a community presents challenges for and benefits to all living things – plants, animals, and humans. By observing examples from nature, students make connections to their role as responsible members of the world community.

Students are introduced to the biological concept of population, focusing on the benefits and challenges of organisms of the same species living together. They investigate and report on the problems that arise when populations of microscopic organisms become overcrowded. Through the study of a pond, field, or other biological community, students see that natural populations do not exist in isolation and relate their observations to human populations. Students refine laboratory skills while investigating population growth and structure using larger organisms. These investigations become the basis for the school-based action plan developed in Unit 5 and in the Final Course Evaluation.

Unit 3 – Chemistry : Interactions of Common Materials

Using the various forms of media, students develop an awareness of the multitude of common chemical compounds found in everything they use and consume in their everyday lives. They understand and investigate the interactions among compounds and practice literacy skills by appropriately communicating the information learned. Students classify chemicals found in common materials through examination of Household Hazardous Product symbols (HHPs) and Workplace Hazardous Materials Information System (WHMIS) labels found at home, at work, and in the laboratory. They learn and apply different classifications of physical and chemical interactions through research and laboratory activities. Students examine factors that affect rates of chemical and physical interactions qualitatively, through several laboratory investigations. Investigative skills are revisited in the culminating activity in Unit 5 through the research of environmental impacts. In the unit evaluation, students plan, conduct, and communicate the results of an investigation that compares both synthetic and natural materials and their effects on the environment.

Unit 4 -- Physics : Using Electrical Energy

The growing demand for electrical energy has important implications for all communities, influencing quality of life and the state of the environment. Students increase awareness and understanding of issues linked to the generation and use of electrical energy. The activities emphasize the skills of collaboration, safe investigation, numeracy, media literacy, and communicating with an audience. The first activity, which continues throughout the unit, helps students to build an understanding of the terminology used in the study of Electrical Energy. Students

gain an awareness of our reliance on electrical energy and an understanding of the energy conversions associated with the use of electricity. They compare electrical appliances and simple machines with respect to energy, power, current, and potential difference through laboratory investigations. Students design and build a device that generates electrical energy and make modifications to increase its output. They expand their understanding of stewardship and their responsibility as energy conservers by researching methods of generating electricity; analysing social, economic, and/or environmental implications; identifying consumption patterns; and designing and implementing a plan to reduce the consumption of electrical energy.

Unit 5: Community Action Plan

Environmental concerns arise from the growing demand for electrical energy and the increased generation of electric power. Students demonstrate the skills and knowledge gained in prior units through the generation of an action plan and public awareness campaign. They learn personal accountability for the state of the environment and come to understand that their actions impact their community.

Students perform a variety of laboratory investigations into environmental concerns related to generating electricity, e.g., effects of acid rain, oil spills, greenhouse gases, particulate matter, and battery disposal. These investigations combine safe laboratory procedures; posing questions; collecting, organizing, and analysing data; and drawing conclusions. Using a variety of resources, students research the environmental effects of electrical power generation by chemical means on communities and environmentally friendly alternative power generation. The experimental and media-based research lead to the development, presentation, and implementation of a community-based action plan. This task addresses literacy and numeracy through media-based research, problem solving, communication, and presentation of the action plan and media campaign. Students are given opportunities for self-assessment and to receive teacher and peer feedback to improve their final product.

Teaching/Learning Strategies

- Lecture (on-line instruction)
- Demonstration (web-based interactive modules)
- Animated Lessons
- Videoconference
- Reading
- Structured Discussion
- Practical Exercise
- Online Tutorials and Movies
- Case Study
- Discovery
- Brainstorming
- Group Work
- Experiments
- Research Projects
- Self Analysis
- Independent Study
- Forum
- Exam
- Dissection
- Field Trip

Evaluation

Seventy percent (70%) of the grade will be based on assessments and evaluations conducted throughout the course.

Thirty percent (30%) of the grade will be based on a final evaluation. The evaluations referred to in Unit 5: Making Personal Decisions together form 20% of a student’s report card grade, and will be based on a culminating activity with a number of steps where all of the skills learned throughout the course will be demonstrated using a research project of the students choice. This will be followed by a final exam worth 10% which will be a series of short problems and scenarios where the students will be able to use the skills and knowledge gained.

Type of Assessment	Category	Detail	Weighting
Formative 70%	Knowledge and Understanding	<ul style="list-style-type: none"> - understanding of concepts, principles, laws and theories - knowledge of facts and terms - transfer of concepts to new contexts - understanding of relationships between concepts 	18%
	Inquiry	<ul style="list-style-type: none"> - application of the skills and strategies of scientific inquiry - application of technical skills and procedures - use of tools, equipment and materials 	14%
	Communication	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - understanding connections among science, technology, society and the environment 1. - 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 Culminating Activity 20%	Knowledge & Understanding	<i>Making Personal Decisions together form the final 30% of a student's report card grade, and will be based on a final cumulative activity made up of several parts where all of the skills learned throughout the course will be demonstrated using a research project of the students choice. Evaluation includes a test, a proposal, a plan, a peer assessment, teacher conference, an experiment, and a report. The four categories of learning expectations will be included in differing proportions in each task with the overall weighting as follows:</i>	5%
	Inquiry		4%
	Communication		6%
	Making Connections		5%
Final Exam 10%	Knowledge & Understanding	<i>A series of short problems and scenarios where the students will be able to use the skills and knowledge gained in the course.</i>	2.5%
	Inquiry		2%
	Communication		3%
	Making Connections		2.5%

Assessment/Evaluation Strategies

“Paper and Pencil”

tests, exams
quizzes
work sheets

Other

teacher anecdotal records
teacher log
checklists
rubrics

Performance Methods

experiments
portfolios
presentations
demonstrations
diagrams
constructions
proposals
reports

Personal Communication

interviews
forums
self evaluation
peer evaluation

Resources listed in Bibliographical style

Science Power 10, Nelson, 1999

Internet sites as per teacher's lessons.

Hands-on Science Activities www.letstalkscience.uwo.ca

Explore Learning www.explorelearning.com

About Chemistry chemistry.about.com

Science Teacher Resources <http://www.pbs.org/teachers/>

Biology Dictionary <http://biology-online.org/dictionary/?Term=Adnate>

How Stuff Works www.howstuffworks.com

[Www.youtube.com](http://www.youtube.com)

<http://www.webelements.com/>

http://www.chem4kids.com/files/matter_intro.html

<http://www.elmhurst.edu/~chm/vchembook/101Aatoms.html>

<http://www.chemtopics.com/>

Program Planning

This version of SNC2L is offered to students living in isolated northern First Nation communities which do not have access to the usual high school facilities, equipment or teachers associated with secondary education. The course uses the global connections of the Internet for some instruction, direction and research. It is a student-centered semi-virtual classroom .