

Science 14 Course Outline

2022-2023

Mr. J. Serediak

Program Vision

The science 14 program is guided by the vision that all students have the opportunity to develop scientific literacy. The goal of scientific literacy is to develop the science related knowledge, skills and attitudes that students need to solve problems and make decisions, and at the same time help them to become lifelong learners maintaining their sense of wonder about the world around them. Diverse learning experiences within the science program provide students with opportunities to explore, analyze and appreciate the interrelationships among science, technology, society and the environment, and develop understandings that will affect their personal lives, their careers and their futures.

The general goals of this course are to:

- encourage students at all grade levels to develop a critical sense of wonder and curiosity about scientific and technological endeavors.
- enable students to use science and technology to acquire new knowledge and solve problems, so that they may improve the quality of their own lives and the lives of others.
- prepare students to address science related societal, economic, ethical and environmental issues.
- provide students with a foundation in science that creates opportunities for them to pursue progressively higher levels of study, prepares them for science-related occupations, and may
- engage them in science-related hobbies appropriate to their interests and abilities.
- enables students, of varying aptitudes and interests, to develop knowledge of the wide spectrum of careers related to science, technology and the environment.

Program Instruction:

Delivery of the curriculum in Science 14 is multi-faceted. Students will experience a number of teaching methodologies such as; lectures enhanced by the use of powerpoint/Google Slides presentations; direct access to multimedia and Internet links; group interactions through laboratory work, project work, peer assessment, group discussions, etc. Science 14 students will also benefit from individual projects in addition to regular in-class assignments. In addition, each student will have daily access to a classroom set of Chromebooks to enhance learning.

Resources

Resources used in Science 14 include, but are not limited to

- Science.connect1, McGraw-Hill Ryerson
- www.google.ca
- www.youtube.ca
- www.teachertube.com

Google Classroom

This course will use Google classroom as the primary tool for finding assignments, slideshows, note packages etc.

Class Code: fhfkei7

Units of Study

Unit 1: Investigating Properties of Matter Chapters 1-4

Sept. 1 - Oct. 7 , 2022

Learning how to handle chemicals relies on knowledge of matter and its classification, and safe handling protocols. In this unit, students will actively investigate properties of matter, which allow for classification of them. With this knowledge and skills, students can handle chemicals safely at school, home and for some, future careers. In this unit, students will focus on the following concepts and outcomes:

- Revisit properties of matter and explain how this knowledge helps with the identification of numerous elements.
- Differentiate between chemical and physical properties
- Examine practical classifications before moving to chemical classifications.
- Re-examine WHMIS from the GHP 2015 perspective as well as understand distinctions between the use of WHMIS and the HHPS guidelines
- Separate, mix, and prepare a variety of household substances based on their properties
- Review the periodic table of elements and learn about elements and compounds (compare and contrast properties)
- Discover practical applications of the periodic table and properties of matter.
- Examine solubility, solvents, solutes and solutions within the context of the particle model of matter.
- Students will explore links to Career and Technology that are related to the content in Unit A (page 15 Science 14-24 Program of Studies)

Unit 2: Energy Transfer Technologies
Chapters 5-7

Oct.10 - Nov 3, 2022

This unit emphasizes Science and Technology. Students will answer how energy efficiencies may be improved with respect to machines. Students will also become more aware of why efforts to increase energy efficiencies are important to society and emphasizing our reliance upon non-renewable resources.

Students will focus on the following concepts and outcomes:

- Heat and energy. Students will examine the relationship between heat and energy and energy transfer. Students will also learn about how cooling systems, radiation, conduction and convection influence climate. Students will further focus on the technologies that help to decrease undesirable heat transfer or increase desirable heat transfer.
- Students will examine various machines (simple and complex) that transfer energy and multiply force thereby increasing efficiency.
- Students will explore links to Career and Technology that are related to the content in Unit B (page 20 Science 14-24 Program of Studies)

Unit 3: Matter and Energy in Living Systems
Chapters 8-11

Nov.4 - Dec. 16 , 2022

The focus in this unit is how life processes require an exchange of matter between living systems and the external environment. Students will gain an understanding of how living systems work by learning about life processes at the cellular and system level. Students will then be required to consider how lifestyle choices influence the ability of organisms to function at an optimal level.

Students will focus on the following concepts and outcomes:

- The digestive and circulatory systems (function, exchanges, genetics, lifestyle, homeostasis, imbalance, disorders and disease)
- Nutrition and diet (label analysis, fad diets, excess)
- Cellular function as it relates to living organisms (microscopy)
- Plants and the role they play in the exchange of matter (structure, function, and adaptations)
- Cell to organ to system to organism.
- Students will explore links to Career and Technology that are related to the content in Unit C (page 25 Science 14-24 Program of Studies)

Unit 4: Matter and Energy in the Environment
Chapters 12-15

Dec 19. – Jan. 20, 2023

This unit has a social and environmental emphasis. Questions that will focus this unit include; “How is human activity influencing the natural flow of matter and energy in the biosphere?” “Should humans as a species be concerned about the effects of their activities on other species and the environment?” Students will trace the path of energy from the sun to its role in maintaining equilibrium in the biosphere. Students will focus on the following concepts and outcomes:

- Biotic and abiotic factors and their influence on the health of an ecosystem
- food chains, food webs, energy pyramids
- recycling, biodegradability, etc
- impact of agricultural technologies
- factors that affect population growth
- Students will explore links to Career and Technology that are related to the content in Unit D (page 30 Science 14-24 Program of Studies)

Assessment in Science 14:

Student success can be determined using different strategies in Science 14. Evaluations will be either formative (f) or summative (s). Formative evaluation intends to help students achieve their personal best ~ it supports the process of improvement prior to being “formally assessed” with a grade. Summative evaluation traditionally occurs at the end of the instructional/learning process. This provides feedback about how well the student has met Alberta Education Curriculum objectives/outcomes at that time. Both types of evaluation will appear in PowerSchool.

Course Assessment

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| I. | Classroom assignments, laboratory activities, practice tests, projects, research, etc. | 45% |
| II. | Tests and Exams
Quizzes, Chapter Tests, Unit Exam, Lab Exams, etc. | 35% |

*rewrites are not routinely offered in Science 14. A discussion between the teacher and student must occur. Under most circumstances, students will be required to engage in additional learning activities (review, supplementary worksheets, additional help from the teacher, etc.) before rewriting tests are considered.

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| III. | Final Examination | 20% |
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*Students who do not adequately complete/submit assessment of/for learning activities have not demonstrated they have met the curricular outcomes. As such, students may not be permitted to write summative quizzes/exams until such requirements have been met in a timely manner as determined by the teacher (in consultation with the student).

Assessment appeals procedure:

- Students are encouraged to retain all materials pertinent to evaluation (assignment, tests, exams, research, projects, etc).
- Should a situation arise where a student is not satisfied with an assessment outcome, first discuss the matter with the teacher outside of class time. If the teacher and the student are unable to resolve the issue, then the teacher will approach another teacher to assess the assignment. (The teacher will not have prior knowledge of the student's name or the previous grade for the given assignment). If there is still an issue, a meeting will be set up between the student, teacher, parents, and administration to resolve the matter. The commencement of an appeal must occur in a timely manner; within 48 hours of receiving the marked assignment. In return, the appeal process will be completed as soon as possible.
- Please see the student agenda for more detailed appeals information.

Bus Days

- In the event of buses not running; I will run a drop in google meet during regular time. This will be time to ask questions , clarify concepts, work on assignments, have group discussions, etc. No new material covered but dependent on the frequency of this situation this could change.

Success in Science 14

- The due date for assignments and labs will be stated and posted in the classroom as well as electronically (Remind or Google Classroom). Students are required to keep track of these dates. Late assignments are discouraged. However, late assignments may be accepted up to 2 days past the due date.
- Students absent on the day of a test or quiz (which they had prior knowledge of), will be expected to complete the test upon their return to class. However, in the event of unforeseen or extenuating circumstances, the student is encouraged to discuss this with me and make alternative arrangements if necessary.
- Any student(s) who roughhouse, misuse materials, or fail to follow instructions during a lab may be asked to leave. The student may be required to make up the curricular outcome in another way (report, etc.)
- Attendance is essential to achieving success in Science 14. In addition, coming to class prepared with paper, pen, pencil, and calculator each day, will support success. Regular review of both the old and new concepts will dramatically increase the results on quizzes, tests, as well as the final exam. Our attendance policy requires that any student missing numerous classes meet with administration to ensure success is achieved.
- If you find that you are struggling with any of the material from class, please arrange to see me for extra help prior to any assessment(s).