

Science 10
Course Outline
Semester 1, 2017/18
Springbank Community High School

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Extra help: Advertised Focus times

Major Focus: Science 10 is an integrated academic course that helps students better understand and apply the concepts and skills common to Biology, Chemistry and Physics. It is the first course leading to the grade eleven courses: Biology, Chemistry, Physics or Science 20. Science 10 consists of three main units of study; a biology unit, a chemistry unit, and a physics unit, as well as an environmental science unit and a brief review of process skills, lab safety and WHMIS.

Evaluation:

Component	Weight
Chapter Quizzes/Assignments	25%
Unit Projects and Labs	25%
Unit Exams	30%
Final Exam	20%

Course Theme: How is energy transferred and transformed? How can we use what we know about energy to innovate?

Units of Study and Intended Outcomes

Energy Flow in Technological Systems (~ Sept. 05 – Oct. 05)

Overview:

The first and second laws (conservation and conversion) of thermodynamics have been useful in the development of modern and efficient energy conversion devices. Students investigating mechanical energy conversions and transfers in systems will recognize that while energy is conserved, useful energy diminishes with each conversion. Students learn that energy can be observed only when it is being transferred, and that mechanical energy can be quantified. Energy conservation and conversion concepts are applied by students to explain energy conversions in natural and technological systems, and to investigate the design and function of energy conversion technologies.

Focusing Questions:

Which came first, science or technology, and is it possible for technological development to take place without help from pure science? How did efforts to improve the efficiency of engines result in the formulation of the first and second laws of thermodynamics? How can the analysis of moving objects help in the understanding of changes in kinetic energy, force and work? Why are efficiency and sustainability important considerations in designing energy conversion technologies?

Cycling of Matter in Living Systems (~ Oct. 11 – Nov. 08)

Overview:

The fundamental unit of life, the cell, is an example of an efficient open system comprised of a cell membrane and organelles that carry out the basic functions of all living organisms. Students will learn that technological advancements in microscopy have enhanced the study of cells and cellular processes. The understanding of life processes at the cellular level can also be applied to multicellular organisms with a strong focus on plants.

Focusing Questions:

How did the cell theory replace the concept of “spontaneous generation” and revolutionize the study of life sciences? How do single-celled organisms carry out life functions? How do plants use specialized cells and processes to accomplish the same functions as a single cell, but on a larger scale? How does imaging technology further our understanding of the structure and function of cells?

Energy and Matter in Chemical Change (~ Nov. 09 – Dec. 14)

Overview:

Chemical changes involve energy and transformations of matter. A knowledge of the underlying structure of matter and the basic chemical species is important in understanding chemical changes. As students explore the properties of molecular and ionic compounds, including acids and bases, they begin to appreciate the need for a classification scheme and a system of nomenclature. Students classify, name compounds and write balanced chemical equations to represent chemical changes. As well, students are introduced to the law of conservation of mass and the mole concept.

Focusing Questions:

How has knowledge of the structure of matter led to other scientific advancements? How do elements combine? Can these combinations be classified and the products be predicted and quantified? Why do scientists classify chemical change, follow guidelines for nomenclature and represent chemical change with equations?

Energy Flow in Global Systems (~ Dec. 15 – Jan. 17)

Overview:

Solar energy sustains life and drives the global climate systems on Earth. Without solar energy there would be no heat or precipitation and, therefore, no life on Earth. Students will gain an understanding that the absorption and transfer of thermal energy at and near Earth's surface results in a variety of climate zones with characteristic weather patterns and biomes. Climatic factors largely determine the flora and fauna found in each of the world's major biomes. The *United Nations Intergovernmental Panel on Climate Change* has stated that the balance of evidence suggests a human influence on global climate. Scientists from various fields are studying this relationship to determine the potential impact on biomes.

Focusing Questions:

Are there relationships between solar energy, global energy transfer processes, climate and biomes? What evidence suggests our climate may be changing more rapidly than living species can adapt? Is human activity causing climate change? How can we reduce our impact on the biosphere and on global climate, while still meeting human needs?

Course Review: (~ Jan. 18 – Jan. 19)

General Science Expectations

Supplies Required for Class:

- Textbook: Science Focus 10 (Replacement Cost \$100.00)
- Materials: Computer, Pen, Pencil, Eraser, Looseleaf Binder/Notebook and Ruler
- Scientific or Graphing Calculator

****Come prepared with all materials to EACH class****

Expectations:

The following expectations and procedures are reflected in the SCHS Science Department policies guide that is available on the class Moodle and my Plone site.

- Cooperation is expected at all times and in all activities.
- Respect for people, their materials and school equipment is a core expectation.
- Punctuality is essential. A late policy will be enforced as outlined in the science department policy handout
- Attendance is required for success. If you must be absent, ***it is your responsibility*** to catch up on all missed work and assignments.
- In order to be successful you must come to class properly prepared, which means having a pen AND pencil, a calculator, notebook/paper, your textbook and your computer for ALL classes.
- While computers and smartphones can be powerful tools for learning, they can also be the biggest distractions to learning in our school. It is expected that students use their computers for appropriate learning related to Science 10. Smart phones are not to be used during class, unless the Science activity relates directly to their use. They are to be

placed in the Smart Phone Hotel prior to the beginning of each class. Inappropriate use may lead to confiscation.

- To enable successful review, previous and current work must be organized. All unit work must be kept in a neatly organized duo tang or binder.
- Homework and assignments must be completed in full, on time and to the best of one's ability.
- When assignments are given, they must be submitted on time. Late assignments will be assigned an NHI (not handed in) designation immediately. The NHI will be removed once the assignment has been submitted. You will be required to use your Focus time for working on an assignment until it is completed.

Exam Policy:

1. Students are expected to use scientific calculators for exams and quizzes. Students may **not** share calculators in test situations. Calculator memory must be cleared for all tests and the final exam.
2. Re-writes may be granted if circumstances warrant and the student has shown sufficient revision / preparation for the re-write to be of service in reflecting improved student understanding. Re-writes are entirely at the teacher's discretion and will be allowed sparingly on a case-by-case basis.
3. In the case of missed unit tests due to an excusable absence, the student must make arrangements with the teacher to write an alternate unit test. Generally, this make-up unit test will be written on the day the student returns to class.
4. In the case of missed unit tests or quizzes due to un-excused absences, an NHI will be given as per the science department marking policy
5. Please refer to the student handbook for school policy and procedures related to the appeal of grades.

Academic Dishonesty

Any assignment submitted that is copied - in whole or in part - from either another student's work or outside resource (ie. magazine, website, newspaper, etc.) without direction from the teacher will receive a designation of Academic Dishonesty (AD) and parents will be notified. An academic dishonesty designation is assigned a mark of zero. The academic dishonesty will remain in place until the assignment is redone properly and has been remarked. Academic dishonesty is a very serious issue, and administration will be involved at the teacher's discretion.