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LETHBRIDGE COLLEGIATE INSTITUTE

Science 10 Course Outline

Science 10 consists of four units of study:

A: Energy and Matter in Chemical Change (Nature of Science Emphasis)
B: Energy Flow in Technological Systems (Science and Technology Emphasis)
C: Cycling of Matter in Living Systems (Nature of Science Emphasis)
D: Energy Flow in Global Systems (Social and Environmental Contexts Emphasis)

The Alberta High School science program deals with the following four foundations

Attitudes:
Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment.

Knowledge:
Students will construct knowledge and understandings of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge.

Science, Technology, and Society (STS):
Students will develop an understanding of the nature of science and technology, the relationships between science and technology, and the social and environmental contexts of science and technology.

Skills:
Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively and for making informed decisions.

These 4 foundations are developed throughout the course.

UNIT A: Energy and Matter in Chemical Change (Chemistry)

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.

UNIT B: Energy Flow in Technological Systems (Physics)

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.

UNIT C: Cycling of Matter in Living Systems (Biology)

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.

UNIT D: Energy Flow in Global Systems (Earth Science)

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.

Course Assessment and Evaluation

Evaluation will consist of a balance between **Formative** and **Summative** assessment.
Formative assessment is assessment "*for*" learning. Tools used for this type of assessment generally address one or two learning objectives and include various types of activities, including (but not limited to) assignments, worksheets, homework, group work, games, or other classroom activities. This allows teachers to track student progress as well as to see and address areas of strength and weakness of particular students and the class as a whole. It allows students to gain practice in a particular area in order to really learn the material before the summative assessment without fear or worry of the assignment affecting their overall course grade.
Summative assessment is considered assessment "*of*" learning. Tools used for this type of evaluation address several learning objectives simultaneously and will include the final exam, unit exams, labs and projects.

Students cannot be successful on summative evaluation if they have not completed the formative assessment!
To make an analogy: *You cannot swim across the English Channel without training and practice!*

Course Breakdown

Unit A: Energy and Matter in Chemical Change	5 weeks	30%
Unit B: Energy Flow in Technological Systems	5 weeks	30%
Unit C: Cycling of Matter in Living Systems	4 weeks	30%
Unit D: Energy Flow in Global Systems	2 weeks	10%

Unit Breakdown

Individual Performance Tasks	40%
Unit Exams	60%

The final grade awarded to students taking Science 10 will be based on:

70% School-based mark
30% Final Exam

Resource

Gue et al, Science Focus 10, McGraw-Hill Ryerson, 2004