

TAKE PRIDE

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## LETHBRIDGE COLLEGIATE INSTITUTE

### Science 20 Course Outline

**Science 20 consists of four units of study:**

**A: Chemical Changes**

**B: Changes in Motion**

**C: The Changing Earth**

**D: Changes in Living Systems**

**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: Chemical Changes**

In this unit, students learn that chemical changes involve a change in energy. In order for students to understand how numerous useful materials are produced, they need to develop an understanding of concentrations of aqueous solutions, oxidation-reduction (redox) processes and the characteristics of hydrocarbons. Economically important industries in Alberta and other parts of Canada are based upon the application of chemical principles.

**UNIT B: Changes in Motion**

Motion is an important aspect of our lives, and the understanding of the effects of force on motion has many technological applications. Students learn that these applications can range from the design of safer roads and sports equipment to the investigation of traffic accidents. In this unit, students investigate the concepts of displacement, velocity, acceleration, force, momentum and mechanical energy and consider the relationships among them.

**UNIT C: The Changing Earth**

The history of our planet is one of change. There is evidence not only that Earth's surface is changing but that this change has, in turn, dramatically impacted the climate and life forms on Earth over time. In this unit, students examine scientific evidence for natural causes of climate change, for changing life forms and for continual changes to the Earth's surface.

**UNIT D: Changes in Living Systems**

Matter cycles and energy dissipates through the biosphere and its component ecosystems.

The concept of an ecosystem is used to explain energy flow and nutrient recycling and to quantify large-scale and long-term processes. Students will study habitat destruction, ecological succession and changes to populations, focusing on the need to balance the interests of a growing human population with sustainable ecosystems.

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### 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: Living Systems Respond to their Environment	4 weeks	24%
Unit B: Chemistry and the Environment	4 weeks	24%
Unit C: Electromagnetic Energy	4 weeks	24%
Unit D: Changes in Living Systems	4 weeks	23%

Project - 5% of course

### Unit Breakdown

Individual Performance Tasks	40%
Unit Exams	60%

**The final grade awarded to students taking Science 20 will be based on:**

**70% School-based mark**  
**30% Final Exam**

### Resource

Bissell, Stan et al, Science 20, Alberta Education, 2006