

Science 9 Course Outline

PROGRAM FOUNDATIONS

To support the development of science literacy, school programs must provide a foundation of learning experiences that address critical aspects of science and its application. These critical areas—the foundations of the program—provide general direction for the program and identify major components of its structure.

Foundation 1

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.

Foundation 2

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.

Foundation 3

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.

Foundation 4

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.

Units of Study

Unit A: Biological Diversity (Social and Environmental Emphasis)

Overview: Biological diversity is reflected in the range of species found in local and global environments and by subtle variations in characteristics found within individual species. In this unit, students learn that diversity is maintained through natural processes of sexual and asexual reproduction, though the survival of individual species—and variations within those species—may be influenced by ecological and human-caused factors. Students examine trends toward loss of diversity and examine related issues concerning environmental quality and the impact of technologies.

Unit B: Matter and Chemical Change (Nature of Science Emphasis)

Overview: Different materials have different properties. The ability to distinguish between different substances and make sense of their properties, interactions and changes requires the development of ideas about chemical substance.

In this unit, students are introduced to the formal study of chemical substance through laboratory investigations and introductory studies of chemical theory. In the laboratory, students observe and compare chemical substances and, with guidance on safety, investigate the properties of materials and the ways they interact. In conjunction with these studies, students are introduced to ideas about elements and compounds, and corresponding structural ideas about atoms and molecules. Theoretical ideas are introduced as means for explaining, interpreting and extending their laboratory findings; these ideas include a general introduction to the periodic table, chemical nomenclature and simplified ways of representing chemical reactions.

Unit C: Environmental Chemistry (Social and Environmental Emphasis)

Overview: Environments are often viewed from a physical and biological perspective, but to fully understand how they function, it is important to view them from a chemical perspective as well. A study of environmental chemistry helps students understand that chemical substances make up the underlying fabric of the world and are part of the process in all natural cycles and changes. Through this unit, students also become aware of human-produced chemical substances that enter and interact with environments, and they investigate potential impacts of different substances on the distribution and abundance of living things.

Unit D: Electrical Principles and Technologies (Science and Technology Emphasis)

Overview: Electricity provides the means to energize many devices, systems and processes that are part of our technological environment. Electrical devices are used to transfer and transform energy, to provide mechanisms for control and to transmit information in a variety of forms. In this unit, students learn the principles that underlie electrical technologies, by studying the form and function of electrical devices and by investigating ways to transfer, modify, measure, transform and control electrical energy. Using a problem-solving approach, students create and modify circuits to meet a variety of needs. Students also develop skills for evaluating technologies, by comparing alternative designs and by considering their efficiency, effectiveness and environmental impact.

Unit E: Space Exploration (Science and Technology Emphasis)

Overview: Technologies have played an essential role in the study of space and in the emerging use of space environments. Our modern understanding of space has developed in conjunction with advances in techniques for viewing distant objects, for transmitting images and data through space, and for manned and unmanned space exploration. A study of space exploration provides an opportunity for students to examine how science and technology interact and to learn how one process augments the other. Students become aware that technologies developed to meet the challenges of space are applied to new purposes.

Evaluation:

Homework and assignments should be written down daily in an agenda, day planner or alternative calendar.

Grading will emphasize individual growth and achievement using a philosophy of differentiated instruction and ongoing formative assessments. The breakdown for each of the five units of study is as follows:

Course Evaluation Summary:

Individual Performance Tasks (including labs, quizzes, and tests)	37.5%
Unit Exams (each exam reflects 20 % of this total)	37.5%
Final Exam	25% (final exam is the PAT)

A final Provincial Achievement Exam (PAT) will be written upon completion of the course. This exam will serve as the course final exam used in the evaluation.