Science 9

**General Curriculum Outcomes**

**STSE:** Students will develop an understanding of the nature of science and technology, of the relationships between science and technology, and of 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.

**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.

**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.

**Specific Curriculum Outcomes**

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| **Unit 1: Atoms and Elements (25%)** |
| **Physical and Chemical Changes** |
| perform experiments, collect evidence, report findings, and demonstrate a knowledge of WHMIS standards in the laboratory (209-7, 111-6, 210-11) |
| investigate materials and describe them in terms of their physical properties (307-12) |
| describe changes in the properties of materials that result from some common chemical reactions (307-13) |
| **Atomic Theory** |
| use models in describing the structure and components of atoms and molecules, and explain the appropriate operational definition (307-14, 208-7) |
| **Periodic** **Table** |
| identify examples of common elements, and compare their characteristics and atomic structure(307-15) |
| use the periodic table as a classification system and compile data about its structure (210-1, 210-2) |
| identify the elements and number of atoms, given a chemical formula (307-16) |
| provide examples of scientific knowledge that have resulted in the development of technologies (111-1) |
| provide examples of technologies that have enhanced, promoted, or made possible scientific research (111-4) |
| explain and provide examples of how society’s needs for chemistry incorporate science, technology, and environment (112-3, 112-8) |
| **Unit 2: Characteristic of Electricity (25%)** |
| **Electric Current**  |
| describe the flow of charge in an electrical circuit and explain the factors affecting the circuit (109-14, 308-16) |
| investigate, in the laboratory, and compare qualitatively, static electricity and electric current (210-7, 308-15) |
| **Series and Parallel Circuits**  |
| describe series and parallel circuits involving varying resistance, voltage, and current (308-17) |
| rephrase questions in a testable form and clearly define practical problems (208-1) |
| use instruments effectively and accurately for collecting data (209-3) |
| identify and suggest explanations for discrepancies in data and identify potential sources of error and determine the amount of error in measurement (210-7, 210-10) |
| **Electricity, Energy and the Environment** |
| relate electrical energy to domestic power consumption costs (308-18) |
| determine quantitatively the efficiency of an electrical appliance that converts electrical energy to heat energy (308-19) |
| describe the transfer and conversion of energy from a generating station to the home (308-20) |
| make informed decisions and propose a course of action on science, technology, and social issues, including human and environmental needs for electricity and energy (113-9, 113-13) |
| **Unit 3: Space Exploration (25%)** |
| **The Beginnings** |
| describe theories on the formation of the solar system (312-1) |
| explain the need for new evidence in order to continually test existing theories about the composition and origin of our solar system and galaxies (110-6, 210-3) |
| describe theories on the origin and evolution of the universe (312-3) |
| **The Universe** |
| describe and classify the major components of the universe (312-2) |
| describe and explain the apparent motion of celestial bodies (312-4) |
| provide and describe examples of how Canadian research projects and careers are supported through science and technology (112-6, 112-11) |
| **The Solar System** |
| describe the composition and characteristics of the components of the solar system (312-5) |
| explain the need for new evidence in order to continually test existing theories and identify new questions that arise (210-16) |
| describe the effects of solar phenomena on Earth (312-6) |
| propose alternative solutions to space life, develop a plan and data, and defend, with a report, your group’s position (208-4, 209-4, 211-1, 211-3, 211-5) |
| **Unit 4: Reproduction (25%)** |
| **Cellular Processes** |
| illustrate and describe the basic processes of mitosis and meiosis (304-11) |
| identify major shifts in scientific world views (110-3) |
| compile and report data and predict values of variables by doing activities on cell populations (210-6, 210-4) |
| **Reproduction** |
| identify questions and investigate, in the laboratory, the reproduction of plants and communicate findings (208-2, 211-2) |
| distinguish between sexual and asexual reproduction in representative organisms (305-2) |
| compare sexual and asexual reproduction in terms of their advantages and disadvantages (305-3) |
| **Genetics** |
| provide examples that arise at home, in an industrial setting, or in the environment that cannot be solved using scientific and technological knowledge (113-10) |
| discuss factors that may lead to changes in a cell’s genetic information (305-5) |
| select and integrate genetics information from various sources and apply criteria for evaluating evidence and sources of information (209-5, 210-8) |
| provide examples of science and technology, including Canadian, that have contributed to and developed genetic knowledge (111-1, 112-12) |