

Science 8

General Curriculum Outcomes

STSE

1. 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

2. 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

3. 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

4. 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

Students will be expected to

Earth and Space Science: Water Systems on Earth (25%)

WAVES, TIDES, AND SHORELINES

- explain how waves and tides are generated and how they interact with shorelines (311-10)
- investigate water currents using experimental data, procedures, and conclusions to formulate operational definitions (208-6, 209-5)
- describe processes of erosion and deposition that result from wave action and water flow (311-11)
- summarize and respond to shoreline's science and technology uses to handle damage due to waves and tides (113-2, 211-2)

OCEANS: SYSTEMS, DISTRIBUTION, SPECIES

- investigate and describe, with technological examples from various sources, processes that lead to the development of ocean basins and continental drainage systems (311-7)
- survey and generalize strengths and weaknesses of science and technologies, including Canadian, that have improved and that support research and development (110-8, 112-5, 210-3, 113-10)
- using data, including graphical, analyze and predict factors that affect productivity and species distribution in marine and fresh water environments (311-8, 210-4, 210-6)
- apply the concept of systems to describe the interactions of ocean currents, winds, and regional climates (111-6, 311-9)

GLACIERS AND POLAR ICECAPS

- describe factors that affect glaciers and polar icecaps, and describe their consequent effects on the environment (311-12)
- identify and examine new questions and problems that arise from all water being connected (210-16)

Physical Science: Fluids (25%)**FORCES IN FLUIDS**

- describe qualitatively the difference between mass and weight (309-1)
- explore and compare objects that describe movement in terms of balanced and unbalanced forces (210-13, 210-14, 309-2)
- describe and explain qualitatively the relationships among pressure, volume, and temperature of fluids when compressed or heated and quantitatively the relationships of force, area, and pressure (309-3, 309-4)
- provide examples and a course of action of how science and technology affect personal and community needs (111-1, 113-2)

DENSITY: FLOATING AND SINKING

- question, investigate, and analyze qualitatively and quantitatively in a laboratory, the relationships among mass, volume, and density of solids, liquids, and gases using the particle model of matter (208-2, 211-3, 307-8)
- explain and describe situations where the density of substances are affected by changes in temperature, natural, or intentional (307-9, 307-10)
- perform and analyze quantitatively the density of various substances, demonstrating a knowledge of WHMIS standards by using proper techniques and instruments for collecting data in the laboratory (307-11, 209-7, 209-3)

VISCOSITY OF LIQUIDS

- design and perform an experiment to test the viscosity of various fluids and identify major variables (208-6)
- compare the viscosity of various liquids and describe factors that can modify the viscosity (307-6, 307-7)
- relate personal activities and potential applications to fluids (109-10, 112-7, 210-12)

Physical Science: Optics (25%)

PROPERTIES OF LIGHT

- identify and describe properties of visible light, using tools and apparatus safely (308-8, 209-6)

REFLECTION AND REFRACTION

- estimate measurements and use tools and apparatus safely in the laboratory (209-2, 209-6)
- describe the laws of reflection of visible light and their applications in everyday life (308-9)
- state a conclusion, based on experimental data and evidence, of light and describe qualitatively how visible light is refracted (210-11, 308-10)
- describe how optical technologies have developed through systematic trial-and-error processes constrained by the optical properties of the materials and the laws of nature (109-5)
- provide examples of optical technologies that enable scientific research and relate personal activities associated with such technologies (109-10, 111-3)

ELECTROMAGNETIC RADIATION

- describe different types of electromagnetic radiation, including infrared, ultraviolet, x-rays, microwaves, and radio waves (308-11)
- explain the importance of choosing words that are scientifically or technologically appropriate (109-13)
- compare properties of visible light to the properties of other types of electromagnetic radiation, including infrared, ultraviolet, x-rays, microwaves, and radio waves (308-12)
- describe, with examples, possible effects of science and technology associated with optics (112-8,113-2)

Life Science: Cells, Tissues, Organs, and Systems (25%)

CELLS

- illustrate and explain that the cell is a living system that exhibits the following characteristics of life (304-4)
- distinguish between plant and animal cells and use microscopes or microviewers to produce a clear image of cells (304-5, 209-3)
- using an operational question, explain that growth and reproduction depend on cell division (208-1, 304-6)

RELATIONSHIP AMONG CELLS, TISSUES, ORGANS, AND SYSTEMS

- distinguish and evaluate between ideas used in the past and theories used today to explain how cells and organs work (110-2, 211-4)
- relate the needs and functions of various cells and organs to the needs and functions of the human organism as a whole (304-8)
- explain structural and functional relationships between and among cells, tissues, organs, and systems in the human body (304-7)

BODY SYSTEMS

- describe the basic factors that affect the functions and efficiency of the human respiratory, circulatory, digestive, excretory, and nervous systems (304-9)
- estimate measurements and organize data for an experiment and explain the results (209-2, 209-4, 210-7)
- describe examples of the interdependence of various systems of the human body (304-10)
- provide examples of careers and applications for informed decisions about science and technology associated with body systems (112-10, 113-8)