

Grade 8 Science

Overview

Unit A: Mix and Flow of Matter introduces students to fluids, substances like air, water, oil and natural gas that flow and take the shape of their containers. Students investigate what fluids are made of, how we use them, and which properties matter most. They learn that many household materials are solutions or suspensions where water is the main ingredient. The particle model of matter helps explain why fluids behave the way they do, including how density, buoyancy, and viscosity affect their use in everyday technologies [See the curriculum](#).

Unit B: Cells and Systems explores the structure and function of living things at different scales, from individual cells to whole organisms. Students learn to interpret life at a variety of levels, from individual cells to complex organisms, understanding how cells, tissues, organs and systems work together. By studying how the parts of a living system interact, students come to understand that healthy organisms function as balanced systems within their environment. This unit helps make sense of the vast diversity of life by identifying patterns and common features across all living things. [See the curriculum](#).

Unit C: Light and Optical Systems examines how we see and how technologies extend our vision. Students investigate the nature of light, how it behaves when it hits different materials, and how lenses and mirrors form images. Tools like microscopes and telescopes have transformed science by letting us see things too small or too far away to observe with our eyes alone. Students use a geometric ray model to explain light's behaviour and explore technologies, from eyeglasses to digital cameras, that depend on the principles of light. [See the curriculum](#).

Unit D: Mechanical Systems focuses on how machines transfer energy into motion and move materials in controlled ways. Students investigate how the parts of a mechanical device link together so that energy flows efficiently and the machine does what it is designed to do. By comparing past and present technologies, students see that different solutions have been used over time to meet the same needs. Understanding mechanical advantage, force, motion and efficiency helps students evaluate how machines affect daily life, communities and the environment. [See the curriculum](#).

Unit E: Freshwater and Saltwater Systems examines the water that covers most of Earth and the living things that depend on it. Students explore how water, land and climate interact to shape aquatic environments. They investigate what makes water suitable for human use, how organisms adapt to freshwater and saltwater habitats, and how human activities affect water quality and the health of aquatic ecosystems. This unit emphasizes the dynamic nature of water systems and investigates factors affecting the distribution and health of living things in aquatic environments and the supply and quality of water for human use [See the curriculum](#).

The year at a glance

Grade 8

Unit	General outcomes	Specific outcomes
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Unit A: Mix and Flow of Matter (Science and Technology Emphasis)	Attitude Outcomes; Skill Outcomes; Outcomes for Science, Technology and Society (STS) and Knowledge	Mutual Respect Students will be encouraged to: - Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds (e.g., show awareness that knowledge of fluids comes from many sources and cultures) See the curriculum; Stewardship Students will be encouraged to: - Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment (e.g., recognize that the disposal of materials through drains affects water quality) See the curriculum; Collaboration Students will be encouraged to: - Work collaboratively in carrying out investigations and in generating and evaluating ideas (e.g., assume responsibility for their share of work in preparing for investigations and in recording observations) See the curriculum; Interest in Science Students will be encouraged to: - Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields (e.g., attempt at home to repeat or extend investigations) See the curriculum; Scientific Inquiry Students will be encouraged to: - Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues (e.g., regularly repeat measurements or observations to increase the precision of results) See the curriculum; Safety Students will be encouraged to: - Show concern for safety in planning, carrying out and reviewing activities (e.g., take the time to organize their work area so that accidents can be prevented; read the labels on materials before using them) See the curriculum; Skill Outcomes (focus on problem solving) Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data See the curriculum; Skill Outcomes (focus on problem solving) Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions See the curriculum; Skill
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Outcomes (focus on problem solving)
Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations See the curriculum; Skill Outcomes (focus on problem solving) Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results See the curriculum; Students will: Investigate and describe fluids used in technological devices and everyday materials See the curriculum; Students will: Identify, interpret and apply technologies based on properties of fluids See the curriculum; Students will: Investigate and describe the composition of fluids, and interpret the behaviour of materials in solution See the curriculum; Students will: Investigate and compare the properties of gases and liquids; and relate variations in their viscosity, density, buoyancy and compressibility to the particle model of matter See the curriculum

Unit B: Cells and Systems (Nature of Science Emphasis)	Skill Outcomes; Attitude Outcomes; Outcomes for Science, Technology and Society (STS) and Knowledge	Mutual Respect Students will be encouraged to: - Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds See the curriculum; Collaboration Students will be encouraged to: - Work collaboratively in carrying out investigations and in generating and evaluating ideas See the curriculum; Interest in Science Students will be encouraged to: - Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields See the curriculum; Scientific Inquiry Students will be encouraged to: - Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues See the curriculum; Safety Students will be encouraged to: - Show concern for safety in planning, carrying out and reviewing activities See the curriculum; Stewardship Students will be encouraged to: - Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment See the curriculum; Skill Outcomes (focus on scientific inquiry) Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data See the curriculum; Skill Outcomes (focus on scientific inquiry) Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions See the curriculum; Skill Outcomes (focus on scientific inquiry) Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations See the curriculum; Skill Outcomes (focus on scientific inquiry) Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results See the curriculum; Students will: Investigate the structure and function of cells, and identify the basic needs of cells See the curriculum; Students will: Investigate
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and describe the structure and function of major systems in the human body, and identify interactions among systems See the curriculum; Students will: Investigate and describe the structure and function of major systems in plants See the curriculum; Students will: Analyze the relationships among cells, tissues, organs and systems in maintaining an organism See the curriculum

Unit C: Light and Optical Systems (Nature of Science Emphasis)	Outcomes for Science, Technology and Society (STS) and Knowledge; Skill Outcomes; Attitude Outcomes	Students will: Investigate the nature of light and vision; and describe the role of invention, explanation and inquiry in developing our current knowledge See the curriculum; Students will: Investigate and explain the science of image formation and vision, and interpret related technologies See the curriculum; Students will: Investigate the transmission of light, and describe its behaviour using a geometric ray model See the curriculum; Skill Outcomes (focus on scientific inquiry) Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results See the curriculum; Skill Outcomes (focus on scientific inquiry) Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions See the curriculum; Skill Outcomes (focus on scientific inquiry) Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data See the curriculum; Skill Outcomes (focus on scientific inquiry) Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations See the curriculum; Mutual Respect Students will be encouraged to: - Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds See the curriculum; Collaboration Students will be encouraged to: - Work collaboratively in carrying out investigations and in generating and evaluating ideas See the curriculum; Interest in Science Students will be encouraged to: - Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields See the curriculum; Scientific Inquiry Students will be encouraged to: - Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues
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See the curriculum

Unit D: Mechanical Systems (Science and Technology Emphasis)	Outcomes for Science, Technology and Society (STS) and Knowledge; Skill Outcomes; Attitude Outcomes	Students will: Investigate the nature of machines and mechanical advantage See the curriculum; Students will: Investigate and describe the transfer of energy in mechanical systems See the curriculum; Students will: Investigate and describe the efficiency of mechanical systems See the curriculum; Skill Outcomes (focus on problem solving) Performing and Recording Students will: Conduct investigations into the relationships between and among observations, and gather and record qualitative and quantitative data See the curriculum; Skill Outcomes (focus on problem solving) Initiating and Planning Students will: Ask questions about the relationships between and among observable variables, and plan investigations to address those questions See the curriculum; Skill Outcomes (focus on problem solving) Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations See the curriculum; Skill Outcomes (focus on problem solving) Communication and Teamwork Students will: Work collaboratively on problems; and use appropriate language and formats to communicate ideas, procedures and results See the curriculum; Mutual Respect Students will be encouraged to: - Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds See the curriculum; Collaboration Students will be encouraged to: - Work collaboratively in carrying out investigations and in generating and evaluating ideas See the curriculum; Interest in Science Students will be encouraged to: - Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields See the curriculum; Scientific Inquiry Students will be encouraged to: - Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues See the curriculum; Safety Students will be encouraged to: - Show concern for safety in planning, carrying out and reviewing activities See the curriculum; Stewardship
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Students will be encouraged to: -
Demonstrate sensitivity and
responsibility in pursuing a balance
between the needs of humans and a
sustainable environment See the
curriculum

Unit E: Freshwater and Saltwater Systems (Social and Environmental Emphasis)	Attitude Outcomes; Outcomes for Science, Technology and Society (STS) and Knowledge; Skill Outcomes	Scientific Inquiry Students will be encouraged to: - Seek and apply evidence when evaluating alternative approaches to investigations, problems and issues See the curriculum; Collaboration Students will be encouraged to: - Work collaboratively in carrying out investigations and in generating and evaluating ideas See the curriculum; Interest in Science Students will be encouraged to: - Show interest in science-related questions and issues, and pursue personal interests and career possibilities within science-related fields See the curriculum; Mutual Respect Students will be encouraged to: - Appreciate that scientific understanding evolves from the interaction of ideas involving people with different views and backgrounds See the curriculum; Stewardship Students will be encouraged to: - Demonstrate sensitivity and responsibility in pursuing a balance between the needs of humans and a sustainable environment See the curriculum; Safety Students will be encouraged to: - Show concern for safety in planning, carrying out and reviewing activities See the curriculum; Students will: Describe the distribution and characteristics of water in local and global environments, and identify the significance of water supply and quality to the needs of humans and other living things See the curriculum; Students will: Analyze factors affecting productivity and species distribution in marine and freshwater environments See the curriculum; Students will: Analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues See the curriculum; Students will: Investigate and interpret linkages among landforms, water and climate See the curriculum; Skill Outcomes (focus on the use of research and inquiry skills to inform the decision-making process) Analyzing and Interpreting Students will: Analyze qualitative and quantitative data, and develop and assess possible explanations See the curriculum; Skill Outcomes (focus on the use of research and inquiry skills to inform
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the decision-making process)
Initiating and Planning Students will:
Ask questions about the relationships
between and among observable
variables, and plan investigations to
address those questions See the
curriculum; Skill Outcomes (focus on
the use of research and inquiry skills
to inform the decision-making
process) Performing and Recording
Students will: Conduct investigations
into the relationships between and
among observations, and gather and
record qualitative and quantitative
data See the curriculum; Skill
Outcomes (focus on the use of
research and inquiry skills to inform
the decision-making process)
Communication and Teamwork
Students will: Work collaboratively on
problems; and use appropriate
language and formats to
communicate ideas, procedures and
results See the curriculum

Across the year

- Students use the particle model of matter to explain the behaviour of fluids, including properties such as density, viscosity and buoyancy that affect their use [See the curriculum: 1, 2](#).
- Investigations of water properties and solutions in Unit A help students understand pure substances, mixtures and solutions, including solubility and saturation points [See the curriculum: 1, 2, 3, 4](#).
- Light and optical systems depend on understanding how materials transmit, absorb and reflect light, while fluids have separate properties, such as density, viscosity and buoyancy, that affect their use in technologies [See the curriculum: 1, 2](#).
- Mechanical systems in Unit D include hydraulics and pneumatics that transfer energy and control motion [See the curriculum: 1, 2](#).
- Throughout all units, students develop skills in planning investigations, gathering and interpreting data, working collaboratively, and communicating their findings using tables, graphs, drawings and oral language. [See the curriculum: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11](#).