BIG IDEAS

Plants and animals have observable features.	Humans interact with matter every day through familiar materials.	The motion of objects depends on their properties.	Daily and seasonal changes affect all living things.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate curiosity and a sense of wonder about the world • Observe objects and events in familiar contexts • Ask simple questions about familiar objects and events **Planning and conducting** • Make exploratory observations using their senses • Safely manipulate materials • Make simple measurements using non-standard units **Processing and analyzing data and information** • Discuss observations • Represent observations and ideas by drawing • Experience and interpret the local environment **Applying and innovating** • Take part in caring for self, family, classroom and school through personal approaches • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Share observations and ideas orally • Express and reflect on personal experiences of **place**	*Students are expected to know the following:* • **basic needs** of plants and animals • features of local **plants** and **animals** that help them meet their basic needs • **First Peoples' uses** of plants and animals • **properties** of **familiar materials** • **effects of pushes/pulls** on movement • effects of size, shape, and materials on movement • **weather** changes • **seasonal changes** • **changes that living things make** to accommodate daily and seasonal cycles

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BIG IDEAS

Living things have features and behaviours that help them survive in their environment.	Matter is useful because of its properties.	Light and sound can be produced and their properties can be changed.	Observable patterns and cycles occur in the local sky and landscape.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate curiosity and a sense of wonder about the world • Observe objects and events in familiar contexts • Ask questions about familiar objects and events • Make simple predictions about familiar objects and events **Planning and conducting** • Make and record observations • Safely manipulate materials to test ideas and predictions • Make and record simple measurements using informal or non-standard methods **Processing and analyzing data and information** • Experience and interpret the local environment • Sort and classify data and information using drawings or provided tables • Compare observations with predictions through discussion • Identify simple patterns and connections **Evaluating** • Compare observations with those of others • Consider some environmental consequences of their actions **Applying and innovating** • Take part in caring for self, family, classroom and school through personal approaches • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Communicate observations and ideas using oral or written language, drawing, or role-play • Express and reflect on personal experiences of place	*Students are expected to know the following:* • the **classification** of living or non-living things • **structural features** of living things in the local environment • **behavioural adaptations** of animals in the local environment • **specific properties** of materials connected to the function of the materials • natural and artificial **sources of light** and **sound** • **properties of light** and **sound** that depend on their source and the objects they interact with • **common objects** in **the sky** • Aboriginal knowledge of the sky and landscape • **local patterns** in events that occur on Earth and in the sky

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BIG IDEAS

All living things have a life cycle.	Materials can be changed through physical and chemical processes.	Forces influence the motion of an object.	Water is essential to all living things, and it cycles through the environment.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate curiosity and a sense of wonder about the world • Observe objects and events in familiar contexts • Ask questions about familiar objects and events • Make simple predictions about familiar objects and events **Planning and conducting** • Make and record observations • Safely manipulate materials to test ideas and predictions • Make and record simple measurements using informal or non-standard methods **Processing and analyzing data and information** • Experience and interpret the local environment • Sort and classify data and information using drawings or provided tables • Compare observations with predictions through discussion • Identify simple patterns and connections **Evaluating** • Compare observations with those of others • Consider some environmental consequences of their actions **Applying and innovating** • Take part in caring for self, family, classroom and school through personal approaches • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Communicate observations and ideas using oral or written language, drawing, or role-play • Express and reflect on personal experiences of place	*Students are expected to know the following:* • **metamorphic** and **non-metamorphic** life cycles of different organisms • similarities and differences between **offspring and parent** • **Aboriginal knowledge** of life cycles • **physical** ways of changing materials • **chemical** ways of changing materials • types of **forces** • **water sources**, including local watersheds • water — a **limited resource** • the water **cycle**

BIG IDEAS

Living things are diverse, can be grouped, and interact in their ecosystems	All matter is made of particles.	Thermal energy can be produced and transferred.	Wind, water, and ice change the shape of the land.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate curiosity about the natural world • Observe objects and events in familiar contexts • Identify questions about familiar objects and events that can be investigated scientifically • Make predictions based on prior knowledge **Planning and conducting** • Suggest ways to plan and conduct an inquiry to find answers to their questions • Consider ethical responsibilities when deciding how to conduct an experiment • Safely use appropriate tools to make observations and measurements, using formal measurements and digital technology as appropriate • Make observations about living and non-living things in the local environment • Collect simple data **Processing and analyzing data and information** • Experience and interpret the local environment • Sort and classify data and information using drawings or provided tables • Use tables, simple bar graphs, or other formats to represent data and show simple patterns and trends • Compare results with predictions, suggesting possible reasons for findings **Evaluating** • Make simple inferences based on their results and prior knowledge • Reflect on whether an investigation was a fair test • Demonstrate an understanding and appreciation of evidence • Identify some simple environmental implications of their and others' actions	*Students are expected to know the following:* • **biodiversity** in the local environment • **Aboriginal knowledge** of **ecosystems** • **energy — needed for life** • **atoms** or molecules as particles of matter • **properties of materials** — related to the particles they consist of • sources of **thermal energy** • **transfer of thermal energy** • major local **landforms** • observable changes in the local environment caused by erosion and deposition by wind, water, and ice

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Learning Standards (continued)	
Curricular Competencies	**Content**
Applying and innovating • Contribute to care for self, others, school, and neighbourhood through personal or collaborative approaches • Co-operatively design projects • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Represent and communicate ideas and findings in a variety of ways, such as diagrams and simple reports, using digital technologies as appropriate • Express and reflect on personal or shared experiences of place	

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BIG IDEAS

All living things and their environment are interdependent.	Matter has mass, takes up space, and can change phase.	Energy comes in a variety of forms that can be transferred from one object to another.	The motion of Earth and the moon cause observable patterns that affect living and non-living systems.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate curiosity about the natural world • Observe objects and events in familiar contexts • Identify questions about familiar objects and events that can be investigated scientifically • Make predictions based on prior knowledge **Planning and conducting** • Suggest ways to plan and conduct an inquiry to find answers to their questions • Consider ethical responsibilities when deciding how to conduct an experiment • Safely use appropriate tools to make observations and measurements, using formal measurements and digital technology as appropriate • Make observations about living and non-living things in the local environment • Collect simple data **Processing and analyzing data and information** • Experience and interpret the local environment • Sort and classify data and information using drawings or provided tables • Use tables, simple bar graphs, or other formats to represent data and show simple patterns and trends • Compare results with predictions, suggesting possible reasons for findings **Evaluating** • Make simple inferences based on their results and prior knowledge • Reflect on whether an investigation was a fair test • Demonstrate an understanding and appreciation of evidence • Identify some simple environmental implications of their and others' actions	*Students are expected to know the following:* • the ways organisms in ecosystems **sense and respond** to their **environment** • solids, liquids, and gases as matter • the **effect of temperature** on pressure in a gas • energy: – has **various forms** – is **conserved** • **devices that transform energy** • local changes caused by **Earth's axis**, **rotation**, **and orbit** • features of **biomes** • the relationship between **the sun and the moon**

Learning Standards (continued)	
Curricular Competencies	**Content**
Applying and innovating • Contribute to care for self, others, school, and neighbourhood through individual or collaborative approaches • Co-operatively design projects • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Represent and communicate ideas and findings in a variety of ways, such as diagrams and simple reports, using digital technologies as appropriate • Express and reflect on personal or shared experiences of place	

BIG IDEAS

Multicellular organisms have organ systems that enable them to survive and interact within their environment.	Solutions are homogeneous mixtures.	Machines are devices that transfer force and energy.	Humans use earth materials as natural resources.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate a sustained curiosity about a scientific topic or problem of personal interest • Make observations in familiar or unfamiliar contexts • Identify questions to answer or problems to solve through scientific inquiry • Make predictions about the findings of their inquiry **Planning and conducting** • Explore and pose questions that lead to investigations • With support, plan appropriate investigations to answer their questions or solve problems they have identified • Decide which variable should be changed and measured for a fair test • Choose appropriate data to collect to answer their questions • Observe, measure, and record data, using appropriate tools, including digital technologies • Use equipment and materials safely, identifying potential risks **Processing and analyzing data and information** • Experience and interpret the local environment • Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data • Identify patterns and connections in data • Compare data with predictions and develop explanations for results • Demonstrate an openness to new ideas and consideration of alternatives	*Students are expected to know the following:* • basic structures and functions of body systems: – **digestive** – **excretory** – **respiratory** – **circulatory** • **solutions and solubility** • properties of **simple machines** and their **force effects** • machines: – **constructed** – **found in nature** • **power** — the rate at which energy is transformed • local types of **earth materials** • the **rock cycle** • Aboriginal concept of **interconnectedness** in the environment • the nature of **sustainable practices** around **BC's living and non-living resources**

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Learning Standards (continued)	
Curricular Competencies	**Content**
Evaluating • Evaluate whether their investigations were fair tests • Identify possible sources of error • Suggest improvements to their investigation methods • Identify some of the assumptions and given information in **secondary sources** • Demonstrate an understanding and appreciation of evidence • Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations **Applying and innovating** • Contribute to care for self, others, and community through personal or collaborative approaches • Co-operatively design projects • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Communicate ideas, explanations, and processes in a variety of ways • Express and reflect on personal, shared, or others' experiences of place	

BIG IDEAS

Multicellular organisms rely on internal systems to survive, reproduce, and interact with their environment.	Everyday materials are often homogeneous (solutions) and heterogeneous mixtures.	Newton's three laws of motion describe the relationship between force and motion.	The solar system is part of the Milky Way, which is one of billions of galaxies.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate a sustained curiosity about a scientific topic or problem of personal interest • Make observations in familiar or unfamiliar contexts • Identify questions to answer or problems to solve through scientific inquiry • Make predictions about the findings of their inquiry **Planning and conducting** • Explore and pose questions that lead to investigations • With support, plan appropriate investigations to answer their questions or solve problems they have identified • Decide which variable should be changed and measured for a fair test • Choose appropriate data to collect to answer their questions • Observe, measure, and record data, using appropriate tools, including digital technologies • Use equipment and materials safely, identifying potential risks **Processing and analyzing data and information** • Experience and interpret the local environment • Construct and use a variety of methods, including tables, graphs, and digital technologies, as appropriate, to represent patterns or relationships in data • Identify patterns and connections in data • Compare data with predictions and develop explanations for results • Demonstrate an openness to new ideas and consideration of alternatives	*Students are expected to know the following:* • the basic structures and functions of body systems: – **musculoskeletal** – **reproductive** – **hormonal** – **nervous** • **heterogeneous mixtures** • **mixtures** — separated using a difference in component properties • **Newton's three laws of motion** • effects of **balanced and unbalanced forces** in **daily physical activities** • **force of gravity** • the overall scale, structure, and age of the universe • the position, motion, and **components of our solar system** in our galaxy • **extreme environments** exist on Earth and in the solar system

Learning Standards (continued)	
Curricular Competencies	**Content**
Evaluating • Evaluate whether their investigations were fair tests • Identify possible sources of error • Suggest improvements to their investigation methods • Identify some of the assumptions and given information in secondary sources • Demonstrate an understanding and appreciation of evidence • Identify some of the social, ethical, and environmental implications of the findings from their own and others' investigations **Applying and innovating** • Contribute to care for self, others, and community through personal or collaborative approaches • Co-operatively design projects • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Communicate ideas, explanations, and processes in a variety of ways • Express and reflect on personal, shared, or others' experiences of place	

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BIG IDEAS

The theory of evolution by natural selection provides an explanation for the diversity and survival of living things.	Elements consist of one type of atom, and compounds consist of atoms of different elements chemically combined.	The electromagnetic force produces both electricity and magnetism.	Earth and its climate have changed over geological time.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest • Make observations aimed at identifying their own questions about the natural world • Identify a question to answer or a problem to solve through scientific inquiry • Formulate alternative "If…then…" hypotheses based on their questions • Make predictions about the findings of their inquiry **Planning and conducting** • Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified • Measure and control variables through fair tests • Observe, measure, and record data (**qualitative** and **quantitative**), using equipment, including digital technologies, with accuracy appropriate to the task • Ensure that safety and ethical guidelines are followed in their investigations **Processing and analyzing data and information** • Experience and interpret the local environment • Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, key, scale models, and digital technologies as appropriate • Seek patterns and connections in data from their own investigations and secondary sources • Use scientific understandings to identify relationships and draw conclusions	*Students are expected to know the following:* • **natural selection** through **adaptive radiation** — a proposed mechanism of the theory of evolution • **survival needs** and interactions between organisms and the environment • **elements** and **compounds** are **substances** • **chemical changes** • **crystalline structure** of solids • electricity — **generated in different ways** with different environmental impacts • electricity — used to **generate magnetism** • **fossil records and geological dating** • evidence of climate change over geological time and the recent **impacts of humans**

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Learning Standards (continued)	
Curricular Competencies	**Content**
Evaluating • Reflect on their investigation methods, including the adequacy of controls on variables and the quality of the data collected • Identify possible sources of error and suggest improvements to their investigation methods • Demonstrate an awareness of assumptions and identify information given and bias in their own work and secondary sources • Demonstrate an understanding and appreciation of evidence (qualitative and quantitative) • Exercise a healthy, informed skepticism and use scientific knowledge and findings for their own investigations to evaluate claims in secondary sources • Consider social, ethical, and environmental implications of the findings from their own and others' investigations **Applying and innovating** • Contribute to care for self, others, community, and world through personal or collaborative approaches • Co-operatively design projects • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate • Express and reflect on a variety of experiences and perspectives of place	

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BIG IDEAS

Cells are a basic unit of life.	The kinetic molecular theory and the theory of the atom explain the behaviour of matter.	Energy can be transferred as both a particle and a wave.	The theory of plate tectonics is the unifying theory that explains Earth's geological processes.

Learning Standards

Curricular Competencies

Students are expected to be able to do the following:

Questioning and predicting

- Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest
- Make observations aimed at identifying their own questions about the natural world
- Identify a question to answer or a problem to solve through scientific inquiry
- Formulate alternative "If…then…" hypotheses based on their questions
- Make predictions about the findings of their inquiry

Planning and conducting

- Collaboratively plan a range of investigation types, including field work and experiments, to answer their questions or solve problems they have identified
- Measure and control variables through fair tests
- Observe, measure, and record data (qualitative and quantitative), using equipment, including digital technologies, with accuracy appropriate to the task
- Ensure that safety and ethical guidelines are followed in their investigations

Processing and analyzing data and information

- Experience and interpret the local environment
- Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, key, scale models, and digital technologies as appropriate
- Seek patterns and connections in data from their own investigations and secondary sources
- Use scientific understandings to identify relationships and draw conclusions

Content

Students are expected to know the following:

- **characteristics of life**
- **cell theory** and **types of cells**
- photosynthesis and cellular respiration
- the relationship of **micro-organisms** with living things:
  - basic functions of the **immune system**
  - **vaccination** and **antibiotics**
  - impacts of **epidemics** and **pandemics** on human populations
- **kinetic molecular theory (KMT)**
- **atomic theory** and **models**
  - **protons,** neutrons**, and quarks**
  - **electrons and leptons**
- **types** and **effects** of electromagnetic radiation
- light:
  - **properties**
  - **behaviours**
  - **ways of sensing**
- **plate tectonic movement**
- major geological events of local significance
- **layers in Earth**

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Learning Standards (continued)	
Curricular Competencies	**Content**
Evaluating • Reflect on their investigation methods, including the adequacy of controls on variables and the quality of the data collected • Identify possible sources of error and suggest improvements to their investigation methods • Demonstrate an awareness of assumptions and identify information given and bias in their own work and secondary sources • Demonstrate an understanding and appreciation of evidence (qualitative and quantitative) • Exercise a healthy, informed skepticism and use scientific knowledge and findings for their own investigations to evaluate claims in secondary sources • Consider social, ethical, and environmental implications of the findings from their own and others' investigations **Applying and innovating** • Contribute to care for self, others, community, and world through personal or collaborative approaches • Co-operatively design projects • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving **Communicating** • Communicate ideas, findings, and solutions to problems, using scientific language, representations, and digital technologies as appropriate • Express and reflect on a variety of experiences and perspectives of place	

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BIG IDEAS

Cells are derived from cells.	The electron arrangement of atoms impacts their chemical nature.	Electricity is the flow of electrons.	The biosphere, geosphere, hydrosphere, and atmosphere are interconnected, as matter cycles and energy flows through them.

Learning Standards

Curricular Competencies	Content
Students are expected to be able to do the following: **Questioning and predicting** • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest • Make observations aimed at identifying their own questions, including increasingly abstract ones, about the natural world • Formulate multiple hypotheses and predict multiple outcomes **Planning and conducting** • Collaboratively and personally plan, select, and use appropriate investigation methods, including field work and lab experiments, to collect reliable data (qualitative and quantitative) • Assess risks and address ethical issues associated with their proposed methods • Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data **Processing and analyzing data and information** • Experience and interpret the local environment • Seek and analyze patterns, trends, and connections in data, including describing relationships between variables and identifying inconsistencies • Use knowledge of scientific concepts to draw conclusions that are consistent with evidence • Analyze cause-and-effect relationships	*Students are expected to know the following:* • asexual reproduction: – **mitosis** – **different forms** • sexual reproduction: – **meiosis** – **human sexual reproduction** • element properties as organized in the **periodic table** • an element's properties are related to the **arrangement** and energy of its electrons and to its atomic size • **circuits** — must be complete for electrons to flow • **voltage**, **current**, **and resistance** • **effects of solar radiation** on the cycling of matter and energy • **matter cycles** within **biotic and abiotic** components of ecosystems • **sustainability** of systems and First Peoples' principles of **interconnectedness**

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Learning Standards (continued)	
Curricular Competencies	**Content**
Evaluating • Evaluate their methods and experimental conditions, including identifying sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions • Describe specific ways to improve their investigation methods and the quality of the data • Evaluate the validity of and limitations of a model or analogy in relation to the phenomenon modelled • Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and secondary sources • Consider the changes in knowledge over time as tools and technologies have developed • Exercise a healthy, informed skepticism and use scientific knowledge and findings to form their own investigations to evaluate claims in secondary sources • Consider social, ethical, and environmental implications of the findings from their own and others' investigations • Critically analyze the validity of information in secondary sources and evaluate the approaches used to solve problems **Applying and innovating** • Contribute to care for self, others, community, and world through personal or collaborative approaches • Co-operatively design projects with local and/or global connections and applications • Transfer and apply learning to new situations • Generate and introduce new or refined ideas when problem solving • Contribute to finding solutions to problems at a local and/or global level through inquiry **Communicating** • Formulate physical or mental theoretical models to describe a phenomenon • Communicate scientific ideas, information, and perhaps a suggested course of action for a specific purpose and audience, constructing evidence-based arguments and using appropriate scientific language, conventions, and representations • Express and reflect on a variety of experiences, perspectives, and worldviews of place	

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