

BIG IDEAS

Earth Materials

Earth materials are changed as they cycle through the geosphere and are used as resources, with economic and environmental implications.

Plate Tectonic Theory

Plate tectonic theory explains the consequences of tectonic plate interactions.

Atmospheric Science and Climate

The transfer of energy through the atmosphere creates weather and is affected by climate change.

Oceanography and the Hydrosphere

The distribution of water has a major influence on weather and climate.

Earth within the Solar System

Astronomy seeks to explain the origin and interactions of Earth and its solar system.

Learning Standards

Curricular Competencies	Content
<p><i>Students are expected to be able to do the following:</i></p> <p>Questioning and predicting</p> <ul style="list-style-type: none"> • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest • Make observations aimed at identifying their own questions, including increasingly abstract ones, about the natural world • Formulate multiple hypotheses and predict multiple outcomes <p>Planning and conducting</p> <ul style="list-style-type: none"> • Collaboratively and individually 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, cultural, and/or environmental issues associated with their proposed methods • Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data • Apply the concepts of accuracy and precision to experimental procedures and data: <ul style="list-style-type: none"> – significant figures – uncertainty – scientific notation 	<p><i>Students are expected to know the following:</i></p> <p>Earth Materials</p> <ul style="list-style-type: none"> • Earth materials can be identified and classified based on their properties: <ul style="list-style-type: none"> – minerals – igneous rocks – sedimentary rocks – metamorphic rocks – geologic resources • the rock cycle explains how rocks are formed, destroyed, and transformed: <ul style="list-style-type: none"> – surface processes – internal processes • economic and environmental implications of geologic resources within BC and globally: <ul style="list-style-type: none"> – First Peoples perspectives – economic feasibility – exploration methods – extraction methods – site remediation

Learning Standards (continued)

Curricular Competencies	Content
<p>Processing and analyzing data and information</p> <ul style="list-style-type: none"> • Experience and interpret the local environment • Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information • Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations, and identifying inconsistencies • Construct, analyze, and interpret graphs, models, and/or diagrams • Use knowledge of scientific concepts to draw conclusions that are consistent with evidence • Analyze cause-and-effect relationships <p>Evaluating</p> <ul style="list-style-type: none"> • 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 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 in primary and secondary sources • Consider the changes in knowledge over time as tools and technologies have developed • Connect scientific explorations to careers in science • Exercise a healthy, informed skepticism and use scientific knowledge and findings to form their own investigations to evaluate claims in primary and secondary sources • Consider social, ethical, and environmental implications of the findings from their own and others' investigations • Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems • Assess risks in the context of personal safety and social responsibility 	<p>Plate Tectonic Theory</p> <ul style="list-style-type: none"> • plate tectonic theory unifies evidence from: <ul style="list-style-type: none"> – continental drift theory – distribution of mountain ranges, volcanoes, and earthquake epicentres – sea-floor spreading and hot spots • convection of heat within Earth's interior drives plate motion and creates unique features at different plate boundaries • plate tectonic settings within BC and local geological terrains: <ul style="list-style-type: none"> – features and processes – First Peoples knowledge <p>Atmospheric Science and Climate</p> <ul style="list-style-type: none"> • the hydrologic cycle is driven by the transfer of energy within the atmosphere and hydrosphere • the atmosphere is divided into layers that have unique properties • the composition of the atmosphere has changed over time: <ul style="list-style-type: none"> – evidence of change – impacts on the carbon cycle • the interaction of water, air, and energy creates weather • solar radiation interacts with the atmosphere, hydrosphere, and geosphere and has impacts on the energy budget

Learning Standards (continued)

Curricular Competencies	Content
<p>Applying and innovating</p> <ul style="list-style-type: none"> • Contribute to care for self, others, community, and world through individual or collaborative approaches • Co-operatively design projects with local and/or global connections and applications • Contribute to finding solutions to problems at a local and/or global level through inquiry • Implement multiple strategies to solve problems in real-life, applied, and conceptual situations • Consider the role of scientists in innovation <p>Communicating</p> <ul style="list-style-type: none"> • 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 through place 	<p>Oceanography and the Hydrosphere</p> <ul style="list-style-type: none"> • the hydrologic cycle is driven by the transfer of energy within the atmosphere and hydrosphere • First Peoples perspectives and knowledge of ocean processes • water is a unique resource and is found in many forms on Earth: <ul style="list-style-type: none"> – fresh water – salt water – environmental concerns • use of remote sensing and direct observation to determine the properties of the ocean and ocean floor • ocean currents are dependent on salinity, temperature, and density • oceans and lakes influence local and global climates • water sources are affected by climate change • First Peoples knowledge of climate change and interconnectedness as related to environmental systems <p>Earth within the Solar System</p> <ul style="list-style-type: none"> • the nebular hypothesis explains the origin of the formation of solar systems: <ul style="list-style-type: none"> – formation of planets and moons – composition of planets – density of planets – spacing of planets • Earth is a unique planet within its solar system • stars are the centre of a solar system and can be classified based on their characteristics • impacts of the Earth-moon-sun system • application of space technologies to study changes to Earth and its systems