

BIG IDEAS

Earth Materials

Minerals and rocks are the foundation of the rock cycle and can be used as resources that drive industry and global economies.

Geologic Time

Geologic time is preserved in Earth's rock record as fossils and reflects profound changes in the history of life on Earth.

Plate Tectonic Theory

Tectonic plates are in constant motion and their interactions produce earthquakes, volcanoes, and characteristic landforms on the Earth's surface.

Deformation and Mapping

Geological maps and models are tools used to represent surface features and subsurface structures.

Surface Processes and the Hydrosphere

Weathering and erosion processes shape landscapes through the interaction of the geosphere and hydrosphere.

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"> • minerals can be classified and grouped based on their properties and composition • rocks can be compared and classified based on their properties and processes of formation: <ul style="list-style-type: none"> – igneous – sedimentary – metamorphic • resource deposits within BC and globally: <ul style="list-style-type: none"> – origin and formation – economic, environmental, and First Peoples considerations

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>Geologic Time</p> <ul style="list-style-type: none"> • the geologic time scale sequences the major events in Earth's history • the fossil record: <ul style="list-style-type: none"> – evidence of evolution – methods of fossil formation – fossil deposits in BC – First Peoples perspective on the fossil record • dating methods of rocks and events: <ul style="list-style-type: none"> – relative dating – absolute dating • Earth's past can be reconstructed by correlating fossils and rock strata <p>Plate Tectonic Theory</p> <ul style="list-style-type: none"> • earthquakes are a result of plate motion: <ul style="list-style-type: none"> – properties – measurement – hazards • the origins of magma and volcanism are related to plate tectonic theory: <ul style="list-style-type: none"> – within Earth – at the Earth's surface • First Peoples knowledge of geologic events • various sources of evidence support a layered model of Earth

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>Deformation and Mapping</p> <ul style="list-style-type: none"> • rock strata can behave in a plastic or brittle manner, depending on internal and external influences • faulting and folding are characteristic of specific tectonic environments and forces: <ul style="list-style-type: none"> – compressional – tensional – shear • geologic maps, cross-sections, and block diagrams can be used to represent surface and subsurface structures: <ul style="list-style-type: none"> – geologic history – resource exploration <p>Surface Processes and the Hydrosphere</p> <ul style="list-style-type: none"> • weathering and erosional processes modify the Earth's surface and produce characteristic features • periods of glaciation produce characteristic erosional and depositional features and landforms: <ul style="list-style-type: none"> – causes of glaciation – local landscapes within BC – First Peoples knowledge of landforms over time • running water (streams and rivers) produces characteristic erosional and depositional features and landforms • groundwater is a renewable resource whose quality and quantity are affected by human activities locally and globally • causes and controls of mass wasting