**Area of Learning: SCIENCE — Geology Grade 12**

**BIG IDEAS**

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| **Minerals, rocks, and earth materials** form in response to conditions within and on the Earth’s surface and are the foundation of many resource-based industries. |  | **Earth’s geological and biological history** is interpreted and inferred from information stored in rock strata and fossil evidence. |  | The **plate tectonic theory** explains the changes that occur within Earth and to Earth’s crust throughout geological time. |  | The **form, arrangement, and structure of rocks** are affected by three-dimensional forces over time. |  | **Weathering and erosion processes** continually reshape landscapes through the interaction of the geosphere with the hydrosphere and atmosphere.  |

**Learning Standards**

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| **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, 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

Planning and conducting* 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:
	+ significant figures
	+ uncertainty

scientific notation | *Students are expected to know the following:** classification of **minerals**

processes of rock formation: * + **igneous**
	+ **sedimentary**

**metamorphic**B.C. **resource deposits** and others:* + origin and formation

**economic, environmental, and First Peoples considerations*** the geologic time scale and **major events in Earth’s history**
* the local and global **fossil record**:
	+ **evidence of evolution**
	+ methods of fossil formation

First Peoples perspectives* methods for **relative and absolute dating** of rocks, fossils, and geologic events
* reconstruction of Earth’s past through correlation of fossil data and rock strata
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**Area of Learning: SCIENCE — Geology Grade 12**

**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| Processing and analyzing data and information* 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

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 their 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
 | * the formation of **volcanic and deformational features** through plate movement
* **evidence** that supports a layered model of Earth
* **earthquakes** and analysis of seismic waves
* First Peoples knowledge of geologic events
* **internal and external factors** that affect the plasticity of rock strata
* **faulting and folding**
* **geologic maps, cross-sections, and block diagrams**
* **weathering and erosion processes**
* First Peoples knowledge of landforms over time
* **periods of glaciation**
* **groundwater and aquifers**
* causes and **controls of mass wasting**
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**Area of Learning: SCIENCE — Geology Grade 12**

**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| Applying and innovating* 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

Communicating* Formulate physical or mental theoretical models to describe a phenomenon
* Communicate scientific ideas and 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**
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