**Area of Learning: SCIENCE — Earth Sciences Grade 11**

**BIG IDEAS**

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| **Earth materials** are changed as they cycle through the geosphere and are used as resources, with economic and environmental implications. |  | **Plate tectonic theory** explains the consequences of tectonic plate interactions. |  | The transfer of energy through the **atmosphere** creates weather, and this transfer is affected by climate change. |  | The distribution of **water** has a major influence on weather and climate. |  | Astronomy seeks to explain the origin and interactions of **Earth** **and its solar system**. |

**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:*properties of earth materials: * + **minerals**
	+ **igneous rocks**
	+ **sedimentary rocks**
	+ **metamorphic rocks**

**geologic resources*** surface and internal **processes** of the rock cycle
* **economic and environmental implications** of geologic resources within B.C. and globally
* evidence that supports plate tectonic theory
* factors that affect **plate motion**
* First Peoples knowledge of local plate tectonic settings and geologic terrains
* the **hydrologic cycle**
* changes in the composition of the atmosphere due to natural and human causes
* **weather** as the interaction of water, air, and energy transfer
* solar radiation **interactions** and **impacts on the energy budget**
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**Area of Learning: SCIENCE — Earth Sciences Grade 11**

**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
 | * **evidence of climate change**
* First Peoples knowledge of climate change and interconnectedness as related to environmental systems
* **water as a unique resource**
* First Peoples knowledge and perspectives of water resources and processes
* **properties of** **the ocean and the ocean floor**
* local and global **ocean currents**
* influences of large bodies of water on **local and global climates**
* **effects of climate change** on water sources
* the nebular hypothesis (explanation of the formation and properties of our solar system)
* **Earth as a unique planet** within its solar system
* **stars** as the centre of a solar system
* impacts of the **Earth-moon-sun system**
* application of space technologies to the study of changes in Earth and its systems
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**Area of Learning: SCIENCE — Earth Sciences Grade 11**

**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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