**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** |

**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 |

**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** |  |