BC Logo Min of Ed**Area of Learning: SCIENCE Grade 9**

**BIG IDEAS**

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| Cells are derived from cells. |  | The electron arrangement of atoms impacts their chemical nature. |  | Electric current is the flow of electric charge. |  | The biosphere, geosphere, hydrosphere, and atmosphere are interconnected, as matter cycles  and energy flows through them. |

**Learning Standards**

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| **Curricular Competencies** | **Content** |
| *Students are expected to be able to do the following:*  Questioning and predicting   * **Q&P9** Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal interest * **Q&P17** Make observations aimed at identifying their own questions, including increasingly complex ones, about the natural world * **Q&P16** Formulate multiple hypotheses and predict multiple outcomes   Planning and conducting   * **P&C23** Collaboratively and individually plan, select, and use appropriate investigation methods, including field work and lab experiments, to collect reliable data (qualitative and quantitative) * **P&C22** Assess risks and address ethical, cultural and/or environmental issues associated with their proposed methods and those of others * **P&C24** Select and use appropriate equipment, including digital technologies, to systematically and accurately collect and record data * **P&C18** Ensure that safety and ethical guidelines are followed in their investigations   Processing and analyzing data and information   * **P&A2** Experience and interpret the local environment * **P&A16** Apply First Peoples perspectives and knowledge, other **ways of knowing**, and local knowledge as sources of information * **P&A22** Seek and analyze patterns, trends, and connections in data, including describing relationships between variables (dependent and independent) and identifying inconsistencies * **P&A21** Construct, analyze and interpret graphs (including interpolation and extrapolation), models  and/or diagrams * **P&A23** Use knowledge of scientific concepts to draw conclusions that are consistent with evidence * **P&A20** Analyze cause-and-effect relationships | *Students are expected to know the following:*   * asexual reproduction:   + **mitosis**   + **different forms** * sexual reproduction:   + **meiosis**   + **human sexual reproduction** * element properties as organized in the **periodic table** * The arrangement of electrons determines the **compounds** formed by elements * **circuits** —must be complete for electrons to flow * **voltage**, **current**, **and resistance** * **effects of solar radiation** on the cycling of matter and energy * **matter** **cycles** within **biotic and abiotic** components of ecosystems * **sustainability** **of systems** * First Peoples knowledge of **interconnectedness** and **sustainability** |

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**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| Evaluating   * **EVAL24** Evaluate their methods and experimental conditions, including identifying sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions * **EVAL22** Describe specific ways to improve their investigation methods and the quality of the data * **EVAL23** Evaluate the validity and limitations of a model or analogy in relation to the phenomenon modelled * **EVAL21** Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and secondary sources * **EVAL19** Consider the changes in knowledge over time as tools and technologies have developed * **EVAL18** Connect scientific explorations to careers in science * **EVAL15** Exercise a healthy, informed skepticism, and use scientific knowledge and findings to form their own investigations and to evaluate claims in secondary sources * **EVAL12** Consider social, ethical, and environmental implications of the findings from their own and others’ investigations * **EVAL20** Critically analyze the validity of information in secondary sources and evaluate the approaches used to solve problems   Applying and innovating   * **A&I8** Contribute to care for self, others, community, and world through individual or collaborative approaches * **A&I3** Transfer and apply learning to new situations * **A&I1** Generate and introduce new or refined ideas when problem solving * **A&I9** Contribute to finding solutions to problems at a local and/or global level through inquiry * **A&I7** Consider the role of scientists in innovation   Communicating   * **COMM12** Formulate physical or mental theoretical models to describe a phenomenon * **COMM10** Communicate scientific ideas, claims, 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 * **COMM11** Express and reflect on a variety of experiences, perspectives, and worldviews through **place** |  |