**Area of Learning: SCIENCE — Provincial Core Curriculum Grade 10**

**BIG IDEAS**

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| **DNA** is the basis for the diversity of living things. |  | Energy change is required as atoms rearrange in **chemical processes**. |  | **Energy** is conserved, and its transformation can affect living things and the environment. |  | The formation of the **universe** can be explained by the big bang theory. |

**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 interest * Make observations aimed at identifying their own questions, including increasingly complex 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 and those of others * Select and use appropriate equipment, including digital technologies,  to systematically and accurately collect and record data * Ensure that safety and ethical guidelines are followed in their investigations   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 (dependent and independent) and identifying inconsistencies | *Students are expected to know the following:*   * **DNA structure and function** * **patterns of inheritance** * mechanisms for the diversity of life:   + **mutation** and its impact on evolution   + **natural selection** and **artificial selection** * **applied genetics** and **ethical considerations** * rearrangement of atomsin **chemical reactions** * acid-base chemistry * law of conservation of mass * **energy change** during chemical reactions * **practical applications and implications of chemical processes**, including First Peoples knowledge * **nuclear energy** and **radiation** * law of conservation of energy * **potential** and **kinetic** energy * **transformation of energy** * local and global **impacts of energy transformations** from technologies * formation of the universe:   + big bang theory   + **components of the universe over time** * **astronomical data and collection methods** |

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**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| * Construct, analyze, and interpret graphs (including interpolation  and extrapolation), 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 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 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 and to evaluate claims in secondary sources * Consider social, ethical, and environmental implications of the findings from their own and others’ investigations * Critically analyze the validity of information in secondary sources and evaluate the approaches used to solve problems   Applying and innovating   * Contribute to care for self, others, community, and world through  individual or collaborative approaches * Transfer and apply learning to new situations |  |

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**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| * Generate and introduce new or refined ideas when problem solving * Contribute to finding solutions to problems at a local and/or global level through inquiry * Consider the role of scientists in innovation   Communicating   * Formulate physical or mental theoretical models to describe a phenomenon * 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 * Express and reflect on a variety of experiences, perspectives, and worldviews through **place** |  |