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

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

**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**
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