**Area of Learning: SCIENCE — Environmental Science Grade 12**

**BIG IDEAS**

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| Human actions affect the **quality of water** and its ability  to sustain life. |  | Human activities cause **changes  in the** **global  climate system**. |  | **Sustainable land use** is essential to meet the needs of a growing population. |  | **Living sustainably** supports the well-being of self, community,  and Earth. |

**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   Processing and analyzing data and information   * Experience and interpret the local environment | *Students are expected to know the following:*   * **water quality parameters** and **bioindicators** * **availability** and **water use impacts** * global water security:   + laws and regulation   + **conservation of water** * **changes to climate systems** * **impacts of global warming** * **mitigation** and **adaptations** * **soil characteristics** and **ecosystem services** * **land use and degradation** * **land management** * personal choices and **sustainable living** * global **environmental** **ethics, policy, and law** |

**Area of Learning: SCIENCE — Environmental Science Grade 12**

**Learning Standards (continued)**

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| **Curricular Competencies** | **Content** |
| * 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 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 |  |

**Area of Learning: SCIENCE — Environmental Science Grade 12**

**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** |  |