# BIG IDEAS

| | | | |
|---|---|---|---|
| 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

| Curricular Competencies | Content |
|---|---|
| *Students are expected to be able to do the following:* | *Students are expected to know the following:* |
| **Questioning and predicting** <br><br> • Demonstrate a sustained intellectual curiosity about a scientific topic or problem of personal, local, or global interest <br> • Make observations aimed at identifying their own questions, including increasingly abstract ones, about the natural world <br> • Formulate multiple hypotheses and predict multiple outcomes <br><br> **Planning and conducting** <br><br> • Collaboratively and individually plan, select, and use appropriate investigation methods, including field work and lab experiments, to collect reliable data (qualitative and quantitative) <br> • Assess risks and address ethical, cultural, and/or environmental issues associated with their proposed methods <br> • Use appropriate SI units and appropriate equipment, including digital technologies, to systematically and accurately collect and record data <br> • Apply the concepts of accuracy and precision to experimental procedures and data: <br>     – significant figures <br>     – uncertainty <br>     – scientific notation <br><br> **Processing and analyzing data and information** <br><br> • Experience and interpret the local environment | • **water quality parameters** and **bioindicators** <br> • **availability** and **water use impacts** <br> • global water security: <br>     – laws and regulation <br>     – **conservation of water** <br> • **changes to climate systems** <br> • **impacts of global warming** <br> • **mitigation** and **adaptations** <br> • **soil characteristics** and **ecosystem services** <br> • **land use and degradation** <br> • **land management** <br> • personal choices and **sustainable living** <br> • global **environmental ethics, policy, and law** |

## Learning Standards (continued)

| Curricular Competencies | Content |
|---|---|
| <ul><li>Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information</li><li>Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations, and identifying inconsistencies</li><li>Construct, analyze, and interpret graphs, models, and diagrams</li><li>Use knowledge of scientific concepts to draw conclusions that are consistent with evidence</li><li>Analyze cause-and-effect relationships</li></ul>**Evaluating**<ul><li>Evaluate their methods and experimental conditions, including identifying sources of error or uncertainty, confounding variables, and possible alternative explanations and conclusions</li><li>Describe specific ways to improve their investigation methods and the quality of their data</li><li>Evaluate the validity and limitations of a model or analogy in relation to the phenomenon modelled</li><li>Demonstrate an awareness of assumptions, question information given, and identify bias in their own work and in primary and secondary sources</li><li>Consider the changes in knowledge over time as tools and technologies have developed</li><li>Connect scientific explorations to careers in science</li><li>Exercise a healthy, informed skepticism and use scientific knowledge and findings to form their own investigations to evaluate claims in primary and secondary sources</li><li>Consider social, ethical, and environmental implications of the findings from their own and others' investigations</li><li>Critically analyze the validity of information in primary and secondary sources and evaluate the approaches used to solve problems</li><li>Assess risks in the context of personal safety and social responsibility</li></ul> | |

## Learning Standards (continued)

| Curricular Competencies | Content |
|---|---|
| **Applying and innovating**<br><br>• Contribute to care for self, others, community, and world through individual or collaborative approaches<br>• Co-operatively design projects with local and/or global connections and applications<br>• Contribute to finding solutions to problems at a local and/or global level through inquiry<br>• Implement multiple strategies to solve problems in real-life, applied, and conceptual situations<br>• Consider the role of scientists in innovation<br><br>**Communicating**<br><br>• Formulate physical or mental theoretical models to describe a phenomenon<br>• 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<br>• Express and reflect on a variety of experiences, perspectives, and worldviews through **place** | |