Area of Learning: SCIENCE — Environmental Science

BIG IDEAS

Diversity in Local Ecosystems
Local environments contain diverse ecosystems with many roles and relationships.

Processes and Changes in Local Ecosystems
- Interconnected systems sustain healthy ecosystems.
- Ecosystem stability is an important result of sustainability

Sustainability in Local Ecosystems
Human practices affect the sustainability of ecosystems.

Conservation and Restoration of Ecosystems
Humans can play a role in conservation and restoration of ecosystems.

Learning Standards

Curricular Competencies

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

Content

Students are expected to know the following:

Diversity in Local Ecosystems
- abiotic and edaphic factors
- biodiversity:
  - species and their ecological roles
  - relationships and interactions in ecosystems

Processes and Changes in Local Ecosystems
- energy flow
- matter cycles
- population dynamics and landscape structure
- change and stability in ecosystems

Sustainability in Local Ecosystems
- benefits of healthy ecosystems
- humans as agents of change:
  - First Peoples and other traditional ecological knowledge
  - unsustainable and sustainable ecosystem practices

Ministry of Education
### Area of Learning: SCIENCE — Environmental Science

#### Grade 11

### Learning Standards (continued)

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<thead>
<tr>
<th>Curricular Competencies</th>
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<tbody>
<tr>
<td><strong>Processing and analyzing data and information</strong></td>
<td><strong>Conservation and Restoration of Ecosystems</strong></td>
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<tr>
<td>• Experience and interpret the local environment</td>
<td>• environmental stressors challenge ecosystem integrity, health, and sustainability</td>
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<tr>
<td>• Apply First Peoples perspectives and knowledge, other ways of knowing, and local knowledge as sources of information</td>
<td>• ecological restoration principles and practices</td>
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<td>• Seek and analyze patterns, trends, and connections in data, including describing relationships between variables, performing calculations, and identifying inconsistencies</td>
<td>• First Peoples concept of interconnectedness as related to conservation and restoration</td>
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<td>• Construct, analyze, and interpret graphs, models, and/or diagrams</td>
<td>• engagement in ongoing and potential stewardship projects</td>
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<tr>
<td>• Use knowledge of scientific concepts to draw conclusions that are consistent with evidence</td>
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<td>• Analyze cause-and-effect relationships</td>
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### 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 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 | |
## Curricular Competencies

### 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, 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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