BIG IDEAS

Characteristics of Living Things	Process of Evolution	Taxonomy
All living things have common characteristics.	Living things evolve over time.	Organisms are grouped on the basis of identifiable similarities.

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 • 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	**Characteristics of Living Things** • cells are the basic unit of life: – **comparing cell structures** – prokaryotic and eukaryotic – unicellular and multicellular – cell specialization – **sexual and asexual reproduction** – **cellular respiration** and **photosynthesis** • viruses: – **basic structure** and function of a virus – lytic and lysogenic cycles – **effects of viruses on organisms**

Learning Standards (continued)

Curricular Competencies	Content
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, performing calculations, and identifying inconsistencies • Construct, analyze, and interpret **graphs**, **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 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	**Process of Evolution** • evolutionary change: – role of DNA in evolution as a hereditary material – five **agents** of evolutionary change • **development** of the theory of evolution • **models of evolution** • speciation: – divergent evolution – convergent evolution – **co-evolution** • **trends in complexity** • artificial selection and **genetic modifications** **Taxonomy** • taxonomy **principles** for classifying organisms: – **taxons** – phylogenetic tree and **cladogram** – dichotomous key – First Peoples understandings of animal body plans – First Peoples uses of local plants • binomial nomenclature • unifying characteristics of the evolutionary continuum across the kingdoms: – **three domains** – **six kingdoms**

Learning Standards (continued)

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, **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**	