Science

Philosophy and Rationale

What Is Science?
Science is an evidence-based way of knowing that emerges from systematic observation and investigation of the world. It is a human endeavour rooted in curiosity, imagination and experience. It can lead to new knowledge and innovation. Scientific knowledge draws upon many disciplines, including life sciences, physical sciences, and Earth and space sciences. It is constructed and enriched through the collaborative contributions of individuals holding various perspectives.

Why Is Science Important?
Science helps us understand interconnections between ourselves, our world and the universe. The application of scientific knowledge and processes helps us make informed decisions and address local and global needs. As students grow in their understanding of science, they become better equipped as ethical citizens and environmental stewards.

Science education is guided by the vision that all students can participate in society as scientifically literate citizens. Students who are scientifically literate have the capacity to critically evaluate information, make informed decisions and solve problems. Students equipped with scientific knowledge and skills will have opportunities to pursue a variety of scientific and technological interests, studies and career options.

Science curriculum aims to develop and support scientifically literate students by emphasizing particular aspects of science education. Through engaging with science concepts, including the nature of science, students mature in their understanding of natural phenomena over the course of their education. Development of the process skills of scientific inquiry and technological problem solving cultivates open-mindedness and furthers an appreciation for the importance of accuracy and honesty. As students deepen their grasp of the relationships among science, technology, society and the environment, they strengthen their appreciation for the role of science in their lives.

Inclusive Education
Science education supports learning that builds upon students’ experiences, prior knowledge and strengths. The science curriculum is designed to help all students develop essential science understandings and processes while providing opportunities to explore areas of interest. Since science naturally lends itself to collaborative and activity-based learning experiences, science
curriculum enables a variety of ways in which students can meaningfully build scientific knowledge and skills.

**First Nations, Métis and Inuit Experiences and Perspectives**

First Nations, Métis and Inuit have a history of understanding the dynamics and interconnections of environmental stewardship and sustainability that are based on experiences and observations gathered by living and being on the land over centuries. For generations and through oral tradition, Elders and Knowledge Keepers have passed down insights and information. This cumulative body of Indigenous knowledge and practices makes valuable contributions to the study of science. Students are more likely to be engaged and inspired when provided opportunities for learning through a holistic, land-based approach to science that builds and contributes to a diverse scientific community. This broadened understanding of science education advances reconciliation.

**Francophone Cultures and Perspectives**

Science curriculum provides opportunities for scientific concepts to be taught through a Francophone cultural lens or perspective that helps all students gain a better understanding of identities in Canada. Acknowledging and integrating historical and contemporary contributions to science made by Francophones from Canada and around the world promotes respect for diversity in the scientific community. This integration and the opportunities provided will support Francophone students in constructing their identity and in cultivating their sense of belonging while recognizing their cultural roots and roles within their communities.

**Literacy**

Science supports the development of literacy\(^1\) and literacy enhances students’ understanding of science. When literacy concepts specific to science are made explicit, students see how they can use their literacy skills, strategies and knowledge in purposeful ways.

Literacy is foundational to learning the terminology, conventions and text features of science. Students use literacy to engage in collaborative discourse about scientific concepts, procedures and connections. Literacy skills help students create and interpret a variety of scientific texts, including laboratory reports or scientific journals. Students develop and use literacy skills when they analyze ideas, formulate hypotheses, and describe and explain scientific phenomena.

Literacy awareness, knowledge and understanding in science enrich students’ ability to see the purpose and value of science and to recognize how they can be engaged and informed citizens.

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\(^1\) Literacy is the ability, confidence and willingness to engage with language to acquire, construct and communicate meaning.
**Numeracy**

Numeracy\(^2\) is essential to interacting with quantitative and spatial information in science. Development of numeracy skills supports comprehension, visualization and application of abstract concepts. Students use numeracy skills to create and interpret scientific representations of objects and quantity through models, diagrams, graphs, symbols and numbers. In science, numeracy awareness, knowledge and understanding enable students to see the purpose and value of the scientific concepts that they are learning and supports them in becoming engaged, informed citizens.

**Competencies**

Competencies are combinations of attitudes, skills and knowledge that students apply for successful learning, living and working. They emphasize aspects of learning that apply within and across all subjects. Alberta’s Kindergarten to Grade 12 learning outcomes in science provide contexts for students to apply and develop the following competencies:

- Critical Thinking
- Problem Solving
- Managing Information
- Creativity and Innovation
- Communication
- Collaboration
- Cultural and Global Citizenship
- Personal Growth and Well-being

For more information, go to [Competencies in Science](#).

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\(^2\) Numeracy is the ability, confidence and willingness to engage with quantitative and spatial information to make informed decisions.