

Competencies and Current Programs of Study

SCIENCE

Competencies are combinations of attitudes, skills and knowledge that students develop and apply for successful learning, living and working. In school, competencies help students achieve learning outcomes and transfer their learning to new situations. Alberta's curriculum promotes the development of eight competencies, which are a streamlined expression of the competencies identified in the Ministerial Order on Student Learning (#001/2013). The following are examples that describe how competencies may be expressed within the context of Alberta's current Kindergarten to Grade 12 Science programs of study.

CRITICAL THINKING in science involves using reasoning to question and test ideas, build understanding and develop scientific literacy. Students:

- use relevant criteria to evaluate scientific data, claims, theories or statements;
- reason inductively and deductively to form and test hypotheses, categorize data or draw conclusions;
- investigate the impact of assumptions and uncertainty when testing or interpreting hypotheses, generalizations and theories; and
- apply scientific information with objectivity or fair-mindedness to make judgements or draw conclusions.

MANAGING INFORMATION in science involves accessing, collecting, processing and validating information to develop, confirm or apply scientific knowledge. Students:

- carry out procedures to accurately and efficiently collect data or acquire scientific information;
- synthesize and present data or information for effective and consistent interpretation;
- use appropriate conventions to reference scientific data or information;
- report scientific data or information with objectivity and honesty; and
- respect how the integrity and reliability of evidence is critical to the validation of scientific claims.

PROBLEM SOLVING in science involves developing and applying scientific processes, knowledge or technologies to address needs. Students:

- design, evaluate and implement processes of scientific inquiry to answer questions about the world;
- select appropriate tools and strategies to acquire and analyze data and scientific information;
- appreciate that scientific and technological problems can be approached from different perspectives to yield multiple solutions; and
- employ a variety of strategies to solve scientific problems with flexibility and perseverance.

CREATIVITY AND INNOVATION in science involves exploring materials, ideas or resources to generate new scientific ideas, products or processes. Students:

- recognize how new ideas or discoveries influence, and are influenced by, scientific knowledge and technologies;
- demonstrate ingenuity and resourcefulness when designing or adapting investigations, models or devices for a specific purpose;
- identify and evaluate potential applications of scientific information, discoveries or technologies; and
- are curious, inventive and open to new ideas about the world.

COMMUNICATION in science involves sharing ideas and information to advance scientific understandings, processes, theories or discoveries. Students:

- select and use language, symbols or notation to effectively represent and share scientific ideas;
- acknowledge how clear communication of scientific ideas and evidence furthers the advancement of science and technology;
- examine and apply elements of precision, accuracy or scale when communicating scientific information; and
- consider purpose and audience when participating in discussions on scientific topics or issues.

CULTURAL AND GLOBAL CITIZENSHIP in science involves attending to the practical and ethical implications of science and technology for the sustainability of local and global communities. Students:

- acknowledge how scientific and technological development influences, and is influenced by, society and culture;
- examine intended and unintended consequences of the application of science and technology on environments, cultures or economies;
- make informed and ethically responsible decisions about the application of science and technology; and
- value and respect diverse ways of knowing about the world.

COLLABORATION in science involves working with others to investigate, evaluate and develop scientific ideas. Students:

- share ideas, tasks and responsibilities to design and carry out processes of scientific inquiry;
- demonstrate flexibility and adaptability when working with others to conduct investigations, build devices or create models; and
- value the contributions of others, past and present, when sharing scientific information or ideas, solving problems or engaging in investigations.

PERSONAL GROWTH AND WELL-BEING

in science involves applying understandings of scientific concepts and ideas to make positive choices or set personal goals. Students:

- use scientific information to make informed decisions that promote the well-being of themselves, others and other living things;
- explore science and related career opportunities to set and work toward personal learning, living or working goals;
- apply procedures and practices to ensure the safety of self and others while planning and conducting scientific activities;
- demonstrate perseverance and commitment when confronted with challenges while learning and exploring science; and
- develop an interest in science through curiosity about the world.

Evidence of competency development is contextualized by subject-area learning content. Educators are not required to formally evaluate and report on competencies separately from students' progress in achieving learning outcomes. Educators are encouraged to give students feedback on competency development as it relates to specific learning outcomes and activities.