

## Competencies and Current Programs of Study

# MATHEMATICS

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 Mathematics programs of study.

**CRITICAL THINKING** in mathematics involves using reasoning to synthesize or evaluate mathematical ideas. Students:

- make mathematical statements about patterns or relationships;
- apply criteria to analyze or validate mathematical processes, solutions or claims;
- use inductive reasoning to generalize patterns or connections;
- use deductive reasoning and/or logic to check or justify mathematical arguments; and
- investigate the impact of assumptions on mathematical processes, solutions or conclusions.

**MANAGING INFORMATION** in mathematics involves collecting, processing and representing mathematical information and ideas. Students:

- collect pertinent information to make sense of mathematical ideas in a variety of contexts;
- organize or manipulate data to determine mathematical patterns;
- use appropriate tools to represent, model or share mathematical information or ideas; and
- value the role of mathematical representations to reliably depict or verify situations and/or patterns.

**PROBLEM SOLVING** in mathematics involves using mathematical processes or strategies to generate solutions or to support decision-making. Students:

- apply prior knowledge or experience to identify mathematical problems;
- draw upon known mathematical concepts to develop strategies to solve unfamiliar problems;
- accept that mathematical problems may lead to multiple solutions;
- recognize situations where there are no solutions; and
- demonstrate flexibility, persistence and a willingness to take risks to try different mathematical approaches to solving problems.

**CREATIVITY AND INNOVATION** in mathematics involves using flexible thinking and approaches to connect or extend mathematical ideas in new ways. Students:

- explore mathematical ideas or relationships by creating concrete, pictorial or symbolic models;
- make new connections between mathematical concepts;
- create models to describe mathematical ideas or patterns; and
- take risks and think flexibly to play with different mathematical concepts and processes.

**COMMUNICATION** in mathematics involves using a variety of means to clearly express, interpret and share mathematical ideas and patterns. Students:

- use the language, including vocabulary and symbols of mathematics to express ideas or patterns;
- select oral, written, graphical or symbolic representations to effectively convey mathematical ideas or patterns; and
- contribute to classroom dialogue about mathematical ideas using respectful and appropriate language.

**CULTURAL AND GLOBAL CITIZENSHIP** in mathematics involves applying mathematical ideas when interacting within cultural, economic, environmental and social communities. Students:

- apply mathematical information to describe trends, patterns or connections within communities;
- use mathematical information to assess the impact of decisions or actions on communities;
- value the contributions of mathematics to society in a variety of areas such as science, philosophy or art; and
- acknowledge how mathematical ideas are developed and conceptualized across cultures and contexts.

**COLLABORATION** in mathematics involves contributing to a culture of learning that supports the development and application of mathematical ideas. Students:

- share strategies, ideas and representations with others to confirm or extend understandings of mathematical concepts;
- consider a range of ideas and perspectives when contributing to mathematical discussions;
- take responsibility to assume roles that contribute to the completion of mathematical tasks; and
- respect others' experiences and ways of thinking about mathematical concepts.

### **PERSONAL GROWTH AND WELL-BEING**

in mathematics involves using mathematical ideas to make informed decisions related to life experiences. Students:

- apply understandings in mathematics to set goals and make informed decisions that impact well-being;
- consider quantity, frequency, spatial arrangement or measures to make choices in daily life; and
- approach mathematics with the confidence to learn from mistakes and build upon personal strengths.

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.