

Mathematics Extended 11

Foundational Outcomes

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Outcomes Framework Extended Mathematics 11 (2020-2021)

In September 2020, teachers will be working hard to create a space that is safe and welcoming for all learners no matter the location of their “classroom”. The first weeks will still be a time to establish a sense of community, engage learners in rich interactive experiences to promote critical thinking and create opportunities for collaboration and discussion. This is an opportune time to develop a culture and a climate for mathematics learning, conducive to collaboration, risk taking and inquiry.

The **Foundational Outcomes** identified in this document represent outcomes determined to be relevant for future learning in mathematics. Decisions about foundational outcomes were made in consultation with teachers, provincial mathematics team, Board and Regional Centre staff. The foundational outcomes are meant to guide teachers in making decisions about creating learning experiences that will prepare and engage their learners in a responsive way. However, a teacher’s professional judgment remains the most important guide to effectively responding to the needs of their learners.

Colour coding has been used to identify outcomes and indicators as foundational (**green**), optional (**orange**) or non-foundational (**red**) for the 2020-2021 school year.

<p>M01 Solve problems that involve the application of rates.</p> <p>Performance Indicators: all indicators</p>
<p>M02 Solve problems that involve scale diagrams, using proportional reasoning.</p> <p>Performance Indicators: all indicators</p>
<p>M03 Demonstrate an understanding of the relationships among scale factors, areas, surface areas and volumes of similar 2-D shapes and 3-D objects.</p> <p>Performance Indicators: all indicators</p>
<p>G01 Students will be expected to derive proofs that involve the properties of angles and triangles.</p> <p>Performance Indicators: all indicators</p>
<p>G02 Students will be expected to solve problems that involve the properties of angles and triangles.</p> <p>Performance Indicators:</p> <ul style="list-style-type: none">● G02.01 Determine the measures of angles in a diagram that involve parallel lines, angles, and triangles and justify the reasoning.

- G02.02 Identify and correct errors in a given solution to a problem that involves the measures of angles.
- G02.03 Solve a contextual problem that involves angles or triangles.
- G02.04 Construct parallel lines, using only a compass and straightedge or a protractor and straightedge, and explain the strategy used.
- G02.05 Determine if lines are parallel, given the measure of an angle at each intersection formed by the lines and a transversal.

G03 Solve problems that involve the cosine law and the sine law, including the ambiguous case.

Performance Indicators:

- G03.01 Draw a diagram to represent a problem that involves the cosine law or sine law.
- G03.02 Explain the steps in a given proof of the sine law or cosine law.
- G03.03 Solve a problem involving the cosine law that requires the manipulation of a formula.
- G03.04 Explain, concretely, pictorially, or symbolically, whether zero, one, or two triangles exist, given two sides and a non-included angle.
- G03.05 Solve a problem involving the sine law that requires the manipulation of a formula.
- G03.06 Solve a contextual problem that involves the cosine law or the sine law.

LR01 Analyze and prove conjectures, using inductive and deductive reasoning, to solve problems.

Performance Indicators:

- LR01.01 Make conjectures by observing patterns and identifying properties, and justify the reasoning.
- LR01.02 Explain why inductive reasoning may lead to a false conjecture.
- LR01.03 Compare, using examples, inductive and deductive reasoning.
- LR01.04 Provide and explain a counterexample to disprove a given conjecture.
- LR01.05 Prove algebraic and number relationships, such as divisibility rules, number properties, mental mathematics strategies, or algebraic number tricks.
- LR01.06 Prove a conjecture using deductive reasoning (not limited to two-column proofs).
- LR01.07 Determine if an argument is valid and justify the reasoning.
- LR01.08 Identify errors in a given proof.
- LR01.09 Solve a contextual problem involving inductive or deductive reasoning.

LR02 Analyze puzzles and games that involve spatial reasoning, using problem-solving strategies.

Performance Indicators: all indicators

RF01 Model and solve problems that involve systems of linear inequalities in two variables.

Performance Indicators: all indicators

RF02 Demonstrate an understanding of the characteristics of quadratic functions, including:

- vertex
- intercepts
- domain and range
- axis of symmetry

Performance Indicators: all indicators

S01 Analyze, interpret, and draw conclusions from one-variable data using numerical and graphical summaries. (NEW)

Performance Indicators: all indicators

S02 Demonstrate an understanding of normal distribution, including: standard deviation, z-scores.

Performance Indicators: all indicators

S03 Interpret statistical data, using:

- confidence intervals
- confidence levels
- margin of error.

Performance Indicators:

- S03.01 Explain, using examples, how confidence levels, margin of error, and confidence intervals may vary depending on the size of the random sample.
- S03.02 Explain, using examples, the significance of a confidence interval, margin of error, or confidence level.
- S03.03 Make inferences about a population from sample data, using given confidence intervals, and explain the reasoning.
- S03.04 Provide examples from print or electronic media in which confidence intervals and confidence levels are used to support a particular position.
- S03.05 Interpret and explain confidence intervals and margin of error, using examples found in print or electronic media.
- S03.06 Support a position by analyzing statistical data presented in the media.

DA01 Analyse, interpret, and draw conclusions from two-variable data using numerical, graphical, and algebraic summaries.

Performance Indicators: all indicators

DA02 Critically analyze society's use of inferential statistics.

Performance Indicators: all indicators

DA03 Analyze data, identify patterns and extract useful information and meaning from large, professionally collected data sets.

Performance Indicators: all indicators