

Mathematics 7

Foundational Outcomes

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Outcomes Framework Grade 7 (2020-21)

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.

N01 Students will be expected to determine and explain why a number is divisible by 2, 3, 4, 5, 6, 8, 9, or 10, and why a number cannot be divided by 0.

Performance Indicators:

N01.01 Determine if a given number is divisible by 2, 3, 4, 5, 6, 8, 9, or 10, and explain why.

N01.02 Sort a given set of numbers based upon their divisibility using organizers such as Venn and Carroll diagrams.

N01.03 Determine the factors of a given number using the divisibility rules.

N01.04 Explain, using an example, why numbers cannot be divided by 0.

N02 Students will be expected to demonstrate an understanding of the addition, subtraction, multiplication, and division of decimals to solve problems (for more than one-digit divisors or more than two-digit multipliers, the use of technology is expected).

Performance Indicators: all indicators

N03 Students will be expected to solve problems involving percents from 1% to 100% (limited to whole numbers).

Performance Indicators: all indicators

N04 Students will be expected to demonstrate an understanding of the relationship between positive terminating decimals and positive fractions and between positive repeating decimals (with one or two repeating digits) and positive fractions.

Performance Indicators:

N04.01 Predict the decimal representation of a given fraction using patterns.

N04.02 Match a given set of fractions to their decimal representations.

N04.03 Sort a given set of fractions as repeating or terminating decimals.

N04.04 Express a given fraction as a terminating or repeating decimal.

N04.05 Express a given repeating decimal as a fraction.

N04.06 Express a given terminating decimal as a fraction.

N04.07 Provide an example where the decimal representation of a fraction is an approximation of its exact value.

N05 Students will be expected to demonstrate an understanding of adding and subtracting positive fractions and mixed numbers, with like and unlike denominators, concretely, pictorially, and symbolically (limited to positive sums and differences).

Performance Indicators: all indicators

N06 Students will be expected to demonstrate an understanding of addition and subtraction of integers, concretely, pictorially, and symbolically.

Performance Indicators: all indicators

N07 Students will be expected to compare, order, and position positive fractions, positive decimals (to thousandths), and whole numbers by using benchmarks, place value, and equivalent fractions and/or decimals.

Performance Indicators: all indicators

PR01 Students will be expected to demonstrate an understanding of oral and written patterns and their equivalent linear relations.

Performance Indicators: all indicators

PR02 Students will be expected to create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems.

Performance Indicators:

PR02.01 Create a table of values for a given linear relation by substituting values for the variable.

PR02.02 Create a table of values, using a linear relation, and graph the table of values (limited to discrete elements).

PR02.03 Sketch the graph from a table of values created for a given linear relation, and describe the patterns

found in the graph to draw conclusions (e.g., graph the relationship between n and $2n + 3$).

PR02.04 Describe, using everyday language, in spoken or written form, the relationship shown on a graph to solve problems.

PR02.05 Match a given set of linear relations to a set of graphs.

PR02.06 Match a given set of graphs to a given set of linear relations.

PR03 Students will be expected to demonstrate an understanding of preservation of equality by modelling preservation of equality, concretely, pictorially, and symbolically applying preservation of equality to solve equations.

Performance Indicators:

PR03.01 Model the preservation of equality for each of the four operations, using concrete materials and/or pictorial representations; explain the process orally; and record the process symbolically.

PR03.02 Write equivalent forms of a given equation by applying the preservation of equality, and verify using concrete materials (e.g., $3b = 12$ is equivalent to $3b + 5 = 12 + 5$ or $2r = 7$ is equivalent to $3(2r) = 3(7)$).

PR03.03 Solve a given problem by applying preservation of equality.

PR04 Students will be expected to explain the difference between an expression and an equation.

Performance Indicators: all indicators

PR05 Students will be expected to evaluate an expression given the value of the variable(s).

Performance Indicators: all indicators

PR06 Students will be expected to model and solve, concretely, pictorially, and symbolically, problems that can be represented by one-step linear equations of the form $x + a = b$, where a and b are integers.

Performance Indicators: all indicators

PR07 Students will be expected to model and solve, concretely, pictorially, and symbolically, where a , b , and c are whole numbers, problems that can be represented by linear equations of the form $ax + b = c$; $ax = b$; $x \div a = b$, $a \neq 0$

Performance Indicators: all indicators

M01 Students will be expected to demonstrate an understanding of circles by describing the relationships among radius, diameter, and circumference relating circumference to π determining the sum of the central angles constructing circles with a given radius or diameter solving problems involving the radii, diameters, and

circumferences of circles.

Performance Indicators:

M01.01 Illustrate and explain that the diameter is twice the radius in a given circle.

M01.02 Illustrate and explain that the circumference is approximately three times the diameter in a given circle.

M01.03 Explain that, for all circles, pi is the ratio of the circumference to the diameter (C/d) and its value is approximately 3.14.

M01.04 Explain, using an illustration, that the sum of the central angles of a circle is 360° .

M01.05 Draw a circle with a given radius or diameter, with and without a compass.

M01.06 Solve a given contextual problem involving circles

M02 Students will be expected to develop and apply a formula for determining the area of triangles, parallelograms, and circles.

Performance Indicators:

M02.01 Illustrate and explain how the area of a rectangle can be used to determine the area of a triangle.

M02.02 Generalize a rule to create a formula for determining the area of triangles.

M02.03 Illustrate and explain how the area of a rectangle can be used to determine the area of a parallelogram.

M02.04 Generalize a rule to create a formula for determining the area of parallelograms.

M02.05 Illustrate and explain how to estimate the area of a circle without the use of a formula.

M02.06 Generalize a rule to create a formula for determining the area of a given circle.

M02.07 Solve a given problem involving the area of triangles, parallelograms, and/or circles.

G01 Students will be expected to perform geometric constructions, including perpendicular line segments parallel line segments perpendicular bisectors angle bisectors.

Performance Indicators: all indicators

G02 Students will be expected to identify and plot points in the four quadrants of a Cartesian plane, using integral ordered pairs.

Performance Indicators:

G02.01 Label the axes of a four quadrant Cartesian plane and identify the origin.

G02.02 Identify the location of a given point in any quadrant of a Cartesian plane using an integral ordered pair.

G02.03 Plot the point corresponding to a given integral ordered pair on a Cartesian plane with units of 1, 2, 5, or 10 on its axes.

G02.04 Draw shapes and designs in a Cartesian plane using given integral ordered pairs.

G02.05 Create shapes and designs, and identify the points used to produce the shapes and designs, in any quadrant of a Cartesian plane.

G03 Students will be expected to perform and describe transformations (translations, rotations, or reflections) of a 2-D shape in all four quadrants of a Cartesian plane (limited to integral number vertices).

Performance Indicators: all indicators

SP01 Students will be expected to demonstrate an understanding of central tendency and range by

- determining the measures of central tendency (mean, median, mode) and range
- determining the most appropriate measures of central tendency to report findings.

Performance Indicators: all indicators

SP02 Students will be expected to determine the effect on the mean, median, and mode when an outlier is included in a data set.

Performance Indicators: all indicators

SP03 Students will be expected to construct, label, and interpret circle graphs to solve problems

Performance Indicators: all indicators

SP04 Students will be expected to express probabilities as ratios, fractions, and percents.

Performance Indicators: all indicators

SP05 Students will be expected to identify the sample space (where the combined sample space has 36 or fewer elements) for a probability experiment involving two independent events

Performance Indicators: all indicators

SP06 Students will be expected to conduct a probability experiment to compare the theoretical probability (determined using a tree diagram, table, or other graphic organizer) and experimental probability of two independent events.

Performance Indicators: all indicators