THE ACADEMY FOR GIFTED CHILDREN - P.A.C.E.
CURRICULUM OUTLINE
GRADE 7 MATH

OVERALL EXPECTATIONS

By the end of the year, students will:

Social-Emotional Learning Skills and the Mathematical Processes

• apply, to the best of their ability, a variety of social-emotional learning skills to support their use of the mathematical processes and their learning in connection with the expectations in theother five strands of the mathematics curriculum.*Ongoing throughout the year.

Number

• demonstrate an understanding of numbers and make connections to the way numbers are used in everyday life;
• use knowledge of numbers and operations to solve mathematical problems encountered ineveryday life;
• demonstrate an understanding of a variety of problem-solving techniques including enumeration, and trial-and-error;
• solve problems by representing, comparing, and ordering numbers, including rational numbers, in real-life contexts;
• demonstrate the application of addition and subtraction of fractions and integers to solve problems involving whole numbers and decimal numbers, including in real-life contexts;
• demonstrate the application of proportional relationships using percent, ratio, and rate to solve problems, including in real-life contexts.

Algebra

• demonstrate an understanding of a variety of problem-solving techniques involving algebra and linear growing patterns;
• solve problems involving linear growing patterns (where the terms are whole numbers) using concrete materials, graphs, and algebraic expressions, including in real-life contexts;
• model real-life linear relationships graphically and algebraically, and solve simple algebraic equations using a variety of strategies, including inspection and guess and check;
• solve problems and create computational representations of mathematical situations using coding concepts and skills;
• apply the process of mathematical modelling to represent, analyse, make predictions, and provide insight into real-life situations.

Data

• manage, analyse, and use data to make convincing arguments and informed decisions, in various contexts drawn from real life;
• collect and organize categorical, discrete, or continuous primary data and secondary data and display the data using charts and graphs, including frequency tables with intervals, histograms, and scatter plots;
• use probability models to make predictions about real-life events;
• demonstrate an understanding of a variety of problem-solving techniques including organized counting and tree diagrams.

Spatial Sense

Geometry and Spatial Reasoning

• demonstrate an understanding of a variety of problem-solving techniques involving geometry and spatial sense;
• apply the construction of related lines, and classification of triangles, quadrilaterals, and prisms to solve problems in a variety of meaningful contexts;
• demonstrate an understanding of similarity, and distinguishing between similarity and congruence and apply to solving problems including real-life contexts;
• describe location in the four quadrants of a coordinate system, dilatate two-dimensional shapes, and apply transformations to solve problems in a variety of meaningful contexts.

Measurement

• demonstrate an understanding of a variety of problem-solving techniques involving measurement;
• solve problems involving real-life applications of area measurements;
• apply the analysis of the units of measurement, including the area of a trapezoid and the volume of a right prism, to solve problems in a variety of meaningful contexts.

Financial Literacy
• demonstrate the knowledge and skills needed to make informed financial decisions

SPECIFIC EXPECTATIONS

By the end of the year students will:

Social-Emotional Learning Skills and the Mathematical Processes: Ongoing throughout the year
-identify and manage emotions, recognize sources of stress and cope with challenges, maintain positive motivation and perseverance, build relationships and communicate effectively, develop self-awareness and sense of identity;
-apply the mathematical processes of problem solving, reasoning and proving, reflecting, connecting, communicating and representing;
- express and manage their feelings, and show understanding of the feelingsof others, as they engage positively in mathematics activities;
- work through challenging math problems, understanding that their resourcefulness in using various strategies to respond to stress is helping them build personal resilience;
- recognize that testing out different approaches to problems and learning from mistakes is an important part of the learning process, and isaided by a sense of optimism and hope;
- work collaboratively on math problems – expressing their thinking, listening to thethinking of others, and practicing inclusivity – and in that way fostering healthy relationships;
- see themselves as capablemath learners, and strengthen their sense of ownership of their learning, as part of their emerging sense of identity and belonging;
- make connections betweenmath and everyday contexts to help them make informed judgements and decisions.

Number
Number Sense:
Rational Numbers (review from grade 6)
– represent, compare, and order rational numbers including decimals and positive and negative fractions, using a variety of tools in various contexts;
– identify and compare integers found in real-life contexts;
– represent and order integers, using a variety of tools;
– select and justify the most appropriate representation of a quantity for a given context;
– identify and represent perfect squares and square roots, using a variety of tools;
– solve problems using a variety of problem solving techniques including enumeration, and trial-and-error.

Fractions, Decimals, and Percents
-use equivalent fractions to simplify fractions, when appropriate, in various contexts;
-generate fractions and decimal numbers between any two quantities;
-convert between fractions, decimal numbers, and percents, in various contexts;
-understand and recall commonly used percents, fractions, and decimal equivalents;
– determine, through investigation, the relationships among fractions, decimals, percents, and ratios;
– solve problems that involve determining percents, using a variety of tools;
–review rate as a comparison, or ratio, of two measurements with different units;
– review solving problems involving the calculation of unit rates.

Operations:
Properties and Relationships
-use the properties and order of operations, and the relationships between operations, to solve problems involving whole numbers, decimal numbers, fractions, ratios, rates, and percents, including those requiring multiple steps of multiple operations;
– solve multi-step problems arising from real-life contexts and involving whole numbers and decimals, using a variety of tools;
– use estimation when solving problems involving operations with whole numbers, decimals, and percents, to help judge the reasonableness of a solution;
– evaluate expressions that involve whole numbers and decimals, including expressions that contain brackets, using order of operations.

Mental Math
-use mental math strategies and drills to increase and decrease a whole number by 1%, 5%, 10%, 25%,50%, and 100%, and explain the strategies used;
– use a variety of mental strategies to solve problems involving the addition and subtraction of fractions and

decimal.

Addition and Subtraction
-use objects, diagrams, and equations to represent, describe, and solve situations involving addition and subtraction of integers, fractions;
– add and subtract integers, using a variety of tools;
– add and subtract fractions with simple like and unlike denominators, using a variety of tools and algorithms;
– demonstrate, using concrete materials, the relationship between the repeated addition of fractions and the multiplication of that fraction by a whole number.

Multiplication and Division
– generate multiples and factors, using a variety of tools and strategies;
– explain the relationship between exponential notation;
-multiply and divide fractions by fractions using a variety of tools;
– divide whole numbers by fractions and by decimal numbers to hundredths, using concrete materials;
– solve problems involving the multiplication and division of decimal numbers, using a variety of tools;
-identify proportional and non-proportional situations and apply proportional reasoning to solve problems.

Algebra

Patterns and Relationships:

Patterns
– represent linear growing and shrinking patterns, using a variety of tools and strategies;
– make predictions about linear growing and shrinking patterns, through investigation with concrete materials;
– develop and represent the general term of a linear growing pattern, using algebraic expressions involving one operation;
– compare pattern rules and use them to extend patterns, make and justify prediction;
- generate a pattern by adding or subtracting a constant, or multiplying or dividing by a constant, to get the next term;
– solve problems using a variety of problem-solving techniques involving algebra and linear growing patterns.

Equations and Inequaltities:

Variables and Expressions
– model real-life relationships involving constant rates where the initial condition starts at 0, through investigation using tables of values and graphs;
– model real-life relationships involving constant rates, using algebraic equations with variables to represent the changing quantities in the relationship;
– translate phrases describing simple mathematical relationships into algebraic expressions, using concrete materials;
– evaluate algebraic expressions by substituting natural numbers for the variables;
– make connections between evaluating algebraic expressions and determining the term in a pattern using the general term,

Equalities and Inequalities
-solve equations that involve multiple terms, whole numbers, and decimal numbers in various contexts, and verify solutions;
– solve linear equations of the form ax = c or c = ax and ax + b = c or variations such as b + ax = c and c = bx + a (where a, b, and c are natural numbers) by modelling with concrete materials, by inspection, or by guess and check, with and without the aid of a calculator and graph the solutions.
-solve inequalities that involve multiple terms and whole numbers, and verify and graph solutions

Coding: (offered as a specialized class)

Coding Skills
- solve problems and create computational representations of mathematical situations by writingand executing efficient code, including code that involves events influenced by a defined count and/or sub-program and other control structures;
- read and alter existing code, including code that involves events influenced by a defined count and/or sub-program and other control structures, and describe how changes to the code affectthe outcomes and the efficiency of the code.

Data

Data Literacy:

Data Collection and Organization

– collect data by conducting a survey or an experiment to do with themselves, their environment, issues in their school or community, or content from another subject, and record observations or measurements;
– organize into intervals a set of data that is spread over a broad range;
– collect and organize categorical, discrete, or continuous primary data and secondary, and display the data in charts, tables, and graphs that have appropriate titles, and that suit the range and distribution of the data, using a variety of strategies and tools;

Data Visualization

– create an infographic and selecting the appropriate type of graph to represent a set of data, graph the data using technology, and justify the choice of graph;
– explain the relationship between a census, a representative sample, sample size, and a population;
– demonstrate an understanding of the appropriate uses of bar graphs and histograms by comparing their characteristics.

Data Analysis

– read, interpret, and draw conclusions from primary data and from secondary data, presented in charts, tables, and graphs;
– identify bias in data collection methods;
– determine, through investigation, the appropriate measure of central tendency needed to compare sets of data;
– explain how to identify and describe trends, based on the rate of change of data from tables and graphs, using informal language;
– compare two attributes or characteristics using a scatter plot, and determine whether or not the scatter plot suggests a relationship;
– make inferences and convincing arguments that are based on the analysis of charts, tables, and graphs;
– compare two attributes or characteristics, using a variety of data management tools and strategies;
– solve problems using a variety of problem-solving techniques involving organized counting and tree diagrams.

Probability:

– compare, through investigation, the theoretical probability of an event with experimental probability, and explain why they might differ;
-solve various problems that involve probability, using appropriate tools and strategies, including Venn and tree diagrams;
– determine, through investigation, the tendency of experimental probability to approach theoretical probability as the number of trials in an experiment increases, using class-generated data and technology-based simulation models;
– identify the complementary event for a given event, and calculate the theoretical probability that a given event will *not* occur.

Spatial Sense

Geometric and Spatial Reasoning:

Geometric Reasoning

-describe and classify cylinders, pyramids, and prisms according to their geometric properties, including plane and rotational symmetry;
– investigate, using concrete materials, the angles between the faces of a prism, and identify right prisms;
– construct related lines, using angle properties and a variety of tools and strategies;
– sort and classify triangles and quadrilaterals by geometric properties related to symmetry, angles, and sides, through investigation using a variety of tools and strategies;
– construct angle bisectors and perpendicular bisectors, using a variety of tools and strategies, and represent equal angles, equal lengths, parallel lines and perpendicular lines using mathematical notation;
– solve problems using a variety of problem-solving techniques involving geometry and spatial sense.
-draw top, front, and side views, as well as perspective views, of objects and physical spaces, using appropriate scales;
– identify, through investigation, the minimum side and angle information needed to describe a unique triangle;
– distinguish between and compare similar shapes and congruent shapes using a variety of tools and strategies;
– determine, through investigation using a variety of tools, relationships among area, perimeter, corresponding side lengths, and corresponding angles of congruent shapes;
– demonstrate an understanding that enlarging or reducing two-dimensional shapes creates similar shapes.

Location and Movement

– plot points using all four quadrants of the Cartesian coordinate plane;

– identify, perform, and describe dilatations, through investigation using a variety of tools;
– create and analyse designs involving translations, reflections, dilatations, and/or simple rotations of two-dimensional shapes, using a variety of tools and strategies;
– determine, through investigation using a variety of tools, polygons or combinations of polygons that tile a plane, and describe the transformation(s) involved.

Measurement:
-compare, estimate, and determine measurements in various contexts
The Metric System
- describe the differences and similarities between volume and capacity, and apply therelationship between millimetres (mL) and cubic centimetres (cm^3) to solve problems
– research and report on real-life applications of area measurements;
– analyze the units of measurement to solve problems in a variety of meaningful contexts;
– solve problems using a variety of problem-solving techniques involving measurement;
– solve problems that require conversion between metric units of measure;
– solve problems that require conversion between metric units of area;
– solve problems that involve the surface area and volume of right prisms and that require conversion between metric measures of capacity and volume.

Circles
-use the relationships between the radius, diameter, and circumference of a circle to explain the formula for finding the circumference and to solve related problems;
-construct circles when given the radius, diameter, or circumference;
-show the relationships between the radius, diameter, and area of a circle, and use these relationships to explain the formula for measuring the area of a circle and to solve related problems.

Volume and Surface Area
– determine, through investigation using a variety of tools and strategies, the relationship for calculating the area of a trapezoid, and generalize to develop the formula;
– solve problems involving the estimation and calculation of the area of a trapezoid;
– estimate and calculate the area of composite two-dimensional shapes by decomposing into shapes with known area relationships;
– determine, through investigation using a variety of tools and strategies, the relationship between the height, the area of the base, and the volume of right prisms and cylinders with simple polygonal bases, and generalize to develop the formula;
– determine, through investigation using a variety of tools, the surface area of right prisms and cylinders;

Financial Literacy
-identify and compare exchange rates, and covert foreign currencies to Canadian dollars and vice versa;
-identify and describe various reliable sources of information that can help with planning for and reaching a financial goal;
-create, track, and adjust sample budgets designed to meet longer-term financial goals for various scenarios;
-identify various societal and personal factors that may influence financial decision making, and describe the effects that each might have;
-explain how interest rates can impact savings, investments, and the cost of borrowing to pay for good and services over time;
-compare interest rates and fees for different accounts and loans offered by various financial institutions, and determine the best option for different scenarios.

ASSESSMENT AND EVALUATION

Need details in Assessment for, as and of as to what the observations, discussions, quizzes, assignments, tests, projects, group discussion and self reflection are and include them in the assessment and evaluation chart. Critical to have samples of observations and discussions in Assessment of Learning i.e. Evaluation

ASSESSMENT FOR LEARNING (ongoing throughout the year)

	Knowledge/ Understanding	Application	Thinking/ Inquiry	Communication
Checklist	✓			
Discussion		✓	✓	✓
Math/Verb Drills	✓	✓		
Observation		✓		
Group work(independent evaluation)		✓		
Homework Check	✓	✓	✓	✓
Questioning	✓	✓	✓	✓
Quiz	✓	✓	✓	✓

ASSESSMENT AS LEARNING (ongoing throughout the year)

	Knowledge/ Understanding	Application	Thinking/ Inquiry	Communication
Conversation	✓	✓	✓	✓
Self-reflection	✓	✓	✓	✓
Discussion				✓

ASSESSMENT OF LEARNING (EVALUATION)

	Term I	Term II	Term III
Knowledge/Understanding	**20%** • Conversations • Observations • Test	**20%** • Conversations • Observations • Test	**20%** • Conversations • Observations • Test • Rich Performance Task
Application	**35%** • Conversations • Observations • Test	**35%** • Conversations • Observations • Test • Rich Performance Task	**35%** • Conversations • Observations • Test • Rich Performance Task
Thinking/Inquiry	**25%** • Conversations • Observations • Test	**25%** • Conversations • Observations • Test • Rich Performance Task	**25%** • Conversations • Observations • Test • Rich Performance Task
Communication	**20%** • Conversations • Observations • Test	**20%** • Conversations • Observations • Test	**20%** • Conversations • Observations • Test • Rich Performance Task
Total	**100%**	**100%**	**100%**

Final evaluation will be comprised of (Term I + Term II + Term III)/3