MATHEMATICS AT A GLANCE OVERVIEW – GRADE SEVEN

GEOMETRY / MEASUREMENT (25%) 10 weeks

- ✓ Recognize/draw/name/describe/define: diagonals of a polygon, parallel / perpendicular lines, straight / adjacent / reflex angles
- ✓ Draw an estimate of an angle in degrees
- ✓ Measure/draw/copy angles (semi-circular protractor)
- ✓ Identify/name/list properties/give examples of triangles: equilateral, isosceles, scalene, right, acute, obtuse, equiangular
- ✓ Find & measure the height / base of any triangle
- ✓ Combine 2-D figures to make other figures (2 or 3-D)
- ✓ Understand the term similar and the relationships between sides and angles of similar polygons
- ✓ State properties of congruent polygons
- ✓ Classify figures using lines of symmetry
- ✓ Create patterns / symmetrical shapes using transformations (translations, reflections, rotations)
- ✓ Identify / draw combinations of transformations
- ✓ State properties preserved by transformations
- ✓ Identify / create tessellating shapes / explain why
- ✓ Build 3-D objects / analyze & relate to Euler's formula
- ✓ Find perimeter of regular / irregular polygons and composite figures (given length of sides)
- ✓ Find circumference given radius or diameter
- ✓ Compare & estimate area using km^2 / hectares
- ✓ Know that for a given perimeter the area can vary & for a given area the perimeter can vary
- ✓ Estimate, then use formulas to find areas of squares, rectangles, triangles, parallelograms, rhombuses
- ✓ How doubling, tripling sides of a polygon effects area
- ✓ For rectangular prisms: measure, calculate surface area / estimate volume, then use formula / relate length, width, height, surface area and volume
- ✓ Given volume find dimensions of rectangular prism
- ✓ Find volume by measuring displacement of a liquid
- ✓ Use known volumes to estimate for irregular objects
- ✓ Convert units (1 cm^3=1 mL, 1000 cm^3=1000 mL=1 L)
- ✓ Relate between and know metric prefixes from kilo to milli and use this to change units (within SI)

PROBLEM SOLVING (15%) 6 weeks

Find out → Choose a strategy → Solve it → Look back

A VARIETY OF TRANSLATION, PROCESS AND REALISTIC PROBLEMS

- ✓ Use number sentences / equations
- ✓ Work backwards / use patterns / use estimates
- ✓ Consider other ways to solve a problem
- ✓ Use deductive reasoning / eliminate possibilities
- ✓ Recognize sub-problems / hidden information
- ✓ Ascertain the meaning of key words
- ✓ Consider alternate interpretations
- ✓ Make appropriate use of technology
- ✓ Explain how solution was obtained (oral / written)
- ✓ Judge reasonableness of information and results
- ✓ Create / solve problems similar to others solved
- ✓ Make predictions and generalizations
- ✓ Properly display the results
- ✓ Solve problems involving + , -, x ,÷ , whole numbers, fractions, decimals, rates, ratios, percent, length, area, volume, mass, capacity, time, time zones, data, more than one operation

DATA MANAGEMENT (10%) 4 weeks

Collect → Organize → Display → Summarize →Interpret

- ✓ Acquire data using surveys, questionnaires, experiments, observation, research, interviews, published information
- ✓ Recognize that data are affected by nature of sample, method of collection, sample size, biases
- ✓ Discuss factors that distort results
- ✓ Distinguish between /discuss pros and cons of using a sample or a population
- ✓ Use fractional circle graphs, double bar graphs
- ✓ Find the range, median, mode of data
- ✓ Discuss and choose best method to display data
- ✓ Discuss reasonableness of data and results
- ✓ Use technology to organize and display data
- ✓ List possible outcomes and identify favourable outcomes for a single event
- ✓ Use a fraction to describe probability of a single event
- ✓ Predict / calculate probability for repeated experiments
- ✓ Simulate real situations using manipulatives
- ✓ Calculate the probability of a single event (using concrete materials) / use a ratio to describe odds

MATHEMATICS AT A GLANCE OVERVIEW – GRADE SEVEN

NUMBERS & OPERATIONS (35 %) 14 weeks

- ✓ Read and write symbols and words, express orally, compare and/or order numbers using place value less than or equal to 1 000 000 000 and ≥ 0.0001
- ✓ Decimal notation for numbers > one million
- ✓ Place value positions as increasing/decreasing powers of ten
- ✓ Round to the nearest unit, ten, hundred or tenth
- ✓ Terms: exponent, base, power, squared, cubed
- ✓ Expand numerals using powers of ten
- ✓ + , - , x , ÷ by forming compatible numbers
- ✓ + , - , x numbers ending in 8 or 9
- ✓ + , - , x by front-ending / by chaining
- ✓ + , - by bridging + , - special fractions
- ✓ x , ÷ by halving /doubling, factoring, forming aliquot parts
- ✓ x , ÷ using additive or subtractive distribution
- ✓ - in parts / parts from wholes / a mixed no. from a whole
- ✓ ÷ using a power of ten as a divisor
- ✓ Choose between: estimation, algorithm, mental calculation, calculator (+, - , x , ÷)
- ✓ Estimate a sum by clustering
- ✓ Estimate by reformulating, compensating, translating
- ✓ Estimate to place the decimal (x , ÷)
- ✓ Estimate square root of a whole number < 100 **/ r**ecall square root of any perfect square < 100 **/** use estimation and repeated squaring on calculator to find approximate square root
- ✓ Find greatest common factor / least common multiple
- ✓ Use divisibility rules for 2, 5, and 10
- ✓ Perform order of operations in correct order (whole numbers, positive integer exponents, parentheses)
- ✓ Evaluate in a given base with positive integer exponents
- ✓ Use algorithms: 2-digit multipliers and divisors
- ✓ Real world use of integers and fractions / use number line
- ✓ Relate concrete, pictorial, verbal, symbolic for integers and fractions
- ✓ Use models, diagrams, manipulatives, pictures, number line, benchmarks, place value to compare/order/ illustrate fractions, mixed numbers, decimals, integers
- ✓ Use terms: mixed number, improper fraction
- ✓ Understand rational numbers as a: measure, division, ratio
- ✓ Find equivalent fractions by expressing in simplest terms
- ✓ + , - fractions with unlike denominators using manips and pictures; x , ÷ fractions using manips and pictures
- ✓ Estimate then + , - fractions, mixed numbers, decimals
- ✓ Add/subtract integers using manips and diagrams
- ✓ Find common denominator of two or more fractions
- ✓ Convert mixed numbers to improper fractions v v
- ✓ Convert fraction/mixed no. to repeating or terminating decimal and vice versa
- ✓ Multiply / divide decimals (tenths by tenths)
- ✓ Use calculator special function keys: additive / multiplicative constant, decimal, clear display, correct error, clear memory, recall memory
- ✓ Use memory function key to evaluate an expression
- ✓ Use calculator to +, - , x , ÷ fractions / convert fractions to decimals and find repeating period of a rational number
- ✓ Use calculator to check accuracy / correct errors in various ways

RATIO & PROPORTION (10%) 4 weeks

- ✓ Ratio to compare 3 quantities / rate for different quantities
- ✓ Construct rates / ratios from real-life examples
- ✓ Find equivalent rates / ratios (manips, pictures, tables, charts, x or ÷ each term by the same whole number)
- ✓ Express in words or colon form
- ✓ Rename a ratio or rate in lowest terms
- ✓ Read/ interpret scale drawings
- ✓ Find "best buy" / convert percent to a proper fraction and v v
- ✓ Percent as a ratio out of 100 / real-world examples
- ✓ Express ratios as percents / decimals (d=factors of 100)
- ✓ Convert decimal to whole number percent (<100) v v
- ✓ Convert a percent to a proper fraction and v v
- ✓ Use equivalence to find the missing element
- ✓ Solve problems: tips, taxes, discount and sales price

ALGEBRA (5%) 2 weeks

- ✓ Correctly use a variety of ways of expressing products such as parentheses, 3 x n, 3n, mn
- ✓ Terms: variable, constant, expression, equation
- ✓ Evaluate an open expression using whole numbers, fractions, and decimals to replace one variable
- ✓ Evaluate an open expression using whole numbers to replace two variables
- ✓ Translate between English & algebraic expression
- ✓ Solve word problems (manips, diagrams, patterns, tables)
- ✓ Use guess and check or cover up for 1 variable
- ✓ Connect to variables in geo/measurement formulas
- ✓ Use functions: 1-variable (n $\rightarrow$ 2 x n), ordered pairs
- ✓ Graph ordered pairs / tables of values (first quadrant)
- ✓ Describe slides using coordinates