Pre-Algebra (Grade 7 or 8)

All year, 4 hours per week

(Students may take Algebra 1 with permission)

Number Theory:

1. Divisibility
   Divisibility Laws for numbers from 1- 10 not seven, Factors, Factoring, Multiples, Prime Numbers and Composite Numbers, Prime Factors, Prime Factorization, LCM, HCF, Relatively Prime Numbers, Word Problems with LCM and HCF

2. Squares, Square roots, Cubes and cube roots
   Squares of numbers from 1 – 20 and -1 to -20, Perfect Squares, Square of multiples of ten e.g. 300^2, 190000^2, Squares of decimal fractions e.g. 0.14^2, Square root of perfect squares, Difference between the word square root and the radical sign, Square root of multiples of ten, Square root of decimal fractions, Word problems with square and square roots, Estimating square root, Cube of numbers from 1 to 5

3. Exponents
   Writing numbers in exponent form, Writing powers in expanded form, Multiplying powers, Dividing powers, Powers raise to an exponent e.g. $(4^2)^3$, Negative Exponents, Combining multiplication and division of powers

4. Scientific Notation
   Writing large numbers in Scientific notation, Writing decimal fractions in Scientific notation, Writing numbers given in Scientific notation in decimal form, Multiplying and dividing of numbers in scientific notation,

5. Rational and Irrational Numbers
   Sets of numbers and their relationship, Recognizing rational and irrational numbers

Unit: Algebra

1. Understanding that algebra involves using variables to represent numbers;

2. Simplifying algebraic expressions including expanding brackets, adding and subtracting like terms and using exponent rules;

3. Addition, subtraction, multiplication & division of algebraic fractions, knowing how to find the LCM of the denominators when adding or subtracting, and how to invert when dividing;
4. Factorization of algebraic expressions;
5. Substitution of values into expressions or equations to find numeric values;

6. Solving equations from simple ones such as $4x + 3 = 15$ to others including brackets and variables on both sides of the equal sign;

7. Solving inequalities and graphing solutions on number lines;

8. Changing the subject of a formula

9. Taking word problems and writing equations and inequalities and solving them.

Geometry:

1. Angle relationships

2. Types of polygons, properties of polygons especially triangles and quadrilaterals, exterior and interior angles in a polygon, perimeter, area,

3. Pythagoras theorem, congruent triangles, similar triangles, relationship between the sides and angle of a triangle

4. Types of solids, properties of solids especially polyhedrons, nets, surface area, volume

Statistics

1. Organizing data - frequency, tables, line plot, stem and leaf

2. Representing data in graphical form- Bar Graphs, Histograms, Pie Chart, Scatter Plots, Line Graphs, Box and Whiskers

3. Interpreting graphs – Central tendencies, quartiles, percentiles, misrepresentation of graphs,

4. Making decisions based on data