GRADE 8 Syllabus

Number theory

1. Factors
2. Divisibility rules
3. Prime or composite
4. Prime factorization
5. Greatest common factor
6. Least common multiple
7. GCF and LCM: word problems
8. Classify numbers

Integers

1. Integers on number lines
2. Graph integers on horizontal and vertical number lines
3. Absolute value and opposite integers
4. Compare and order integers
5. Integer inequalities with absolute values

Operations With Integers

1. Integer addition and subtraction rules
2. Add and subtract integers using counters
3. Add and subtract integers
4. Add and subtract three or more integers
5. Add and subtract integers: word problems
6. Integer multiplication and division rules
7. Multiply and divide integers
8. Evaluate numerical expressions involving integers

Rational Numbers

1. Write fractions in lowest terms
2. Least common denominator
3. Round decimals and mixed numbers
4. Convert between decimals and fractions or mixed numbers
5. Identify rational and irrational numbers
6. Absolute value of rational numbers
7. Compare rational numbers
8. Put rational numbers in order

Operations With Rational Numbers

1. Reciprocals and multiplicative inverses
2. Add and subtract rational numbers
3. Add and subtract rational numbers: word problems
4. Apply addition and subtraction rules
5. Multiply and divide rational numbers
6. Multiply and divide rational numbers: word problems
7. Apply multiplication and division rules
8. Apply addition, subtraction, multiplication, and division rules
9. Evaluate numerical expressions involving rational numbers

Exponents and Roots

1. Understanding exponents
2. Evaluate exponents
3. Solve equations with variable exponents
4. Exponents with negative bases
5. Exponents with decimal and fractional bases
6. Understanding negative exponents
7. Evaluate negative exponents

8. Multiplication with exponents
9. Division with exponents
10. Multiplication and division with exponents
11. Power rule
12. Evaluate expressions using properties of exponents
13. Identify equivalent expressions involving exponents
14. Square roots of perfect squares
15. Positive and negative square roots
16. Estimate positive and negative square roots
17. Relationship between squares and square roots
18. Solve equations involving squares and square roots
19. Cube roots of perfect cubes
20. Solve equations involving cubes and cube roots
21. Estimate cube roots

Scientific Notation

1. Convert between standard and scientific notation
2. Compare numbers written in scientific notation
3. Multiply numbers written in scientific notation
4. Divide numbers written in scientific notation

Ratios, Rate and Proportion

1. Understanding ratios
2. Identify equivalent ratios
3. Write an equivalent ratio
4. Equivalent ratios: word problems
5. Unit rates
6. Compare ratios: word problems
7. Solve proportions: word problems
8. Do the ratios form a proportion?
9. Do the ratios form a proportion: word problems

10. Solve proportions
11. Estimate population size using proportions
12. Scale drawings: word problems

Percents

1. Convert between percents, fractions, and decimals
2. Compare percents to fractions and decimals
3. Find what percent one number is of another
4. Find what percent one number is of another: word problems
5. Estimate percents of numbers
6. Percents of numbers and money amounts
7. Percents of numbers: word problems
8. Compare percents of numbers
9. Solve percent equations
10. Percent of change
11. Percent of change: word problems

Consumer Math

1. Price lists
2. Unit prices
3. Unit prices with unit conversions
4. Unit prices: find the total price
5. Percent of a number: tax, discount, and more
6. Find the percent: tax, discount, and more
7. Multi-step problems with percents
8. Simple interest

Units of Measurement

1. Convert rates and measurements: customary units
2. Convert rates and measurements: metric units
3. Mixed customary units

4. Convert between customary and metric systems
5. Precision
6. Convert between Celsius and Fahrenheit

Two Dimensional Figures

1. Identify and classify polygons
2. Classify triangles
3. Identify trapezoids
4. Classify quadrilaterals
5. Graph triangles and quadrilaterals
6. Find missing angles in triangles
7. Find missing angles in quadrilaterals
8. Exterior Angle Theorem
9. Interior angles of polygons
10. Identify complementary, supplementary, vertical, adjacent, and congruent angles
11. Find measures of complementary, supplementary, vertical, and adjacent angles
12. Transversal of parallel lines
13. Alternate and corresponding Angles
14. Co-interior Opposite Angles
15. Parts of a circle

Transformation and Congruence

1. Symmetry
2. Identify reflections, rotations, and translations
3. Translations: graph the image
4. Translations: find the coordinates
5. Reflections: graph the image
6. Reflections: find the coordinates
7. Rotations: graph the image
8. Rotations: find the coordinates
9. Side lengths and angle measures of congruent figures

10. Congruent triangles: SSS, SAS, and ASA

Geometric Measurement

1. Perimeter
2. Area
3. Area and perimeter: word problems
4. Area of Circles, semicircles, and quadrants
5. Circles: word problems
6. Volume of cubes, prisms, and pyramids
7. Surface area of cubes, prisms, and pyramids
8. Volume of cylinders
9. Volume of cones
10. Surface area of cylinders
11. Surface area of cones
12. Volume of spheres

Number Sequence

1. Identify arithmetic and geometric sequences
2. Arithmetic sequences
3. Geometric sequences
4. Number sequences: mixed review
5. Number sequences: word problems

Algebraic Expressions and Propeties

1. Write variable expressions
2. Write variable expressions from diagrams
3. Write variable expressions: word problems
4. Evaluate one-variable expressions
5. Evaluate multi-variable expressions
6. Evaluate absolute value expressions
7. Evaluate radical expressions
8. Evaluate rational expressions

9. Identify terms and coefficients
10. Sort factors of expressions
11. Properties of addition and multiplication
12. Multiply using the distributive property
13. Write equivalent expressions using properties
14. Add and subtract like terms
15. Add, subtract, and multiply linear expressions
16. Factors of linear expressions

Single Variable Inequality

1. Solutions to inequalities
2. Graph inequalities on number lines
3. Write inequalities from number lines
4. Solve one-step inequalities
5. Graph solutions to one-step inequalities
6. Solve two-step inequalities
7. Graph solutions to two-step inequalities
8. Solve multi-step inequalities

Linear Equation

1. Solve one-step equations
2. Solve two-step equations
3. Solve equations with brackets
4. Find the slope of a graph
5. Find the slope from two points
6. Find a missing coordinate using slope
7. Find the slope of a linear equation
8. Graph a line from an equation in slope-intercept form
9. Write a linear equation from a slope and y-intercept
10. Write a linear equation from a graph
11. Write a linear equation from a slope and a point

12. Write a linear equation from two points
13. Convert a linear equation in standard form to slope-intercept form
14. Graph a line from an equation in standard form
15. Slopes of parallel and perpendicular lines

Function

1. Identify functions
2. Does (x, y) satisfy the linear function?
3. Identify independent and dependent variables
4. Rate of change
5. Constant rate of change
6. Evaluate a linear function
7. Complete a table for a linear function
8. Complete a table and graph a linear function
9. Interpret the graph of a linear function: word problems
10. Write a linear function from a table
11. Compare linear functions: graphs, tables, and equations
12. Write linear functions: word problems
13. Interpret linear functions
14. Identify linear and nonlinear functions
15. Determine if (x, y) satisfy the linear function?
16. Find values using function graphs
17. Complete a table for a function graph

Data and Graph

1. Interpret tables
2. Interpret bar graphs
3. Create bar graphs
4. Interpret line graphs
5. Create line graphs
6. Interpret histograms
7. Create histograms
8. Create frequency charts
9. Interpret pie charts
10. Create pie charts

Statistics

1. Calculate mean, median, mode, and range
2. Interpret charts and graphs to find mean, median, mode, and range
3. Mean, median, mode, and range: find the missing number
4. Changes in mean, median, mode, and range
5. Quartiles

Probability

1. Probability of simple events
2. Probability of opposite, mutually exclusive, and overlapping events
3. Experimental probability
4. Make predictions
5. Compound events: find the number of outcomes
6. Identify independent and dependent event
7. Probability of independent and dependent events