

**Flossmoor School District 161
Mathematics Curriculum Framework
Grade 8**

Month August/September

Goal #6 Number Sense

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
6.8.02 Read, write, recognize, model, and interpret integers, including translating numerical expressions
6.8.08 Solve problems involving descriptions of numbers, including characteristics and relationships (e.g., exponents, roots, prime/composite, prime factorization, greatest common factor, least common multiple).
6.8.10 Identify and apply order of operations to simplify numeric expressions involving integers (including exponents and roots), fractions, and decimals
6.8.11 Identify and apply the following properties of operations with rational numbers: <ul style="list-style-type: none">• the commutative and associative properties for addition and multiplication;• the distributive property;• the additive and multiplicative identity properties;• the additive and multiplicative inverse properties; and the multiplicative property of zero
6.8.15 Use ratios to describe problem situations
6.8.16 Use proportional reasoning to model and solve problems
6.8.18 Solve number sentences and problems involving fractions, decimals, and percents (e.g., percent increase and decrease, interest rates, tax, discounts, tips)

Goal #8 Algebra

8.8.02 Write an expression using variables to represent unknown quantities

8.8.03 Simplify algebraic expressions

8.8.04 Recognize and generate equivalent forms of algebraic expressions.

8.8.13 Solve word problems involving unknown quantities

Goal #9 Geometry

9.8.12 Relate absolute value to distance on the number line

Mathematics Curriculum Framework – Grade 8

Month October

Goal #6 Number Sense

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
6.8.03 Recognize, translate between, and apply multiple representations of rational numbers (decimals, fractions, mixed numbers, percents, and roots)
6.8.06 Order and compare rational numbers
6.8.07 Identify and locate rational and irrational numbers (e.g., π , $\sqrt{2}$, $\sqrt{5}$) on a number line
6.8.09 Solve problems and number sentences involving addition, subtraction, multiplication, and division using rational numbers, exponents, and roots
6.8.12 Describe the effect of multiplying and dividing by numbers, including the effect of multiplying or dividing a rational number by: <ul style="list-style-type: none">• a number less than zero;• zero;• a number between zero and one; and a number greater than one
6.8.13 Select, use, and justify appropriate operations, methods, and tools to compute or estimate with rational numbers. Verify solutions and determine the reasonableness of results
6.8.17 Read, write, recognize, model, and interpret percents, including those less than 1% and greater than 100%

Goal #7 Measurement

7.8.05 Solve problems involving unit conversions <u>within the same measurement system</u> for length, weight/mass, capacity, square units, and measures expressed as rates (e.g., converting feet/second to yards/minute)
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Goal #8 Algebra

8.8.05 Evaluate or simplify algebraic expressions with one or more rational variable values (e.g., $3a^2 - b$ for $a = 3$ and $b = 7$)

8.8.13 Solve word problems involving unknown quantities

Goal #10 Data Analysis, Statistics, and Probability

10.8.07 Represent all possible outcomes (sample space) for simple or compound events (e.g., tables, grids, tree diagrams)

Mathematics Curriculum Framework – Grade 8

Month November

Goal #6 Number Sense

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
6.8.01 Read, write, and recognize equivalent representations of integer powers of 10
6.8.04 Use scientific notation to represent numbers and solve problems
6.8.05 Represent repeated factors using exponents
6.8.10 Apply order of operations to simplify numeric expressions involving integers (including exponents and roots), fractions, and decimals

Goal #8 Algebra

8.8.07 Represent linear equations and quantitative relationships on a rectangular coordinate system, and interpret the meaning of a specific part of a graph
8.8.13 Solve word problems involving unknown quantities

Goal #9 Geometry

9.8.05 Graph points, and identify coordinates of points on the Cartesian coordinate plane (all four quadrants)
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Mathematics Curriculum Framework – Grade 8

Month December

Goal #10 Data Analysis, Statistics, and Probability

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
10.8.01 Read, interpret (including possible misleading characteristics), and make predictions from data represented in a bar graph, line (dot) plot, Venn diagram (with two or three circles), chart/table, line graph, scatterplot, circle graph, stem-and-leaf plot, or histogram
10.8.02 Compare and contrast the effectiveness of different representations of the same data
10.8.03 Create a bar graph, chart/table, line graph, or circle graph and solve a problem using the data in the graph for a given set of data
10.8.04 Identify or draw a reasonable approximation of the line of best fit from a set of data or a scatter plot, and use the line to make predictions
10.8.05 Analyze and apply measures of central tendency (mode, range, median, and mean) in problem-solving situations
10.8.06 Solve problems involving the probability of an event composed of repeated trials, compound events (including independent events), or future events with or without replacement
10.8.07 Represent all possible outcomes (sample space) for simple or compound events (e.g., tables, grids, tree diagrams)
10.8.08 Solve simple problems involving the number of ways objects can be arranged (permutations and combinations)

Mathematics Curriculum Framework – Grade 8

Month January

Goal #6 Number Sense

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
6.8.09 Solve problems and number sentences involving addition, subtraction, multiplication, and division using rational numbers, exponents, and roots
6.8.14 Estimate the square or cube root of a number less than 1,000 between two whole numbers (e.g., $\sqrt[3]{200}$ is between 5 and 6)

Goal #7 Measurement

7.8.02 Solve problems involving perimeter/circumference and area of polygons, circles, and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description)
7.8.03 Compare and estimate length (including perimeter/circumference), area, volume, weight/mass, and angles (0° to 360°) using referents

Goal #8 Algebra

8.8.01 Analyze, extend, and create sequences or linear functions, and determine algebraic expressions to describe the n^{th} term of a sequence
8.8.12 Solve linear equations and inequalities in one variable over the rational numbers (e.g., $5x+7=-13$, $4x-3=-7x+8$, $-2x+3>-5$)
8.8.13 Solve word problems involving unknown quantities

Goal #9 Geometry

9.8.04 Identify, describe, and determine the radius, diameter, and circumference of a circle and their relationship to each other and to pi

Mathematics Curriculum Framework – Grade 8

Month February

Goal #7 Measurement

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
7.8.01 Select and use appropriate standard units and tools to solve measurement problems, including measurements of polygons and circles
7.8.02 Solve problems involving perimeter/circumference and area of polygons, circles, and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description)
7.8.03 Compare and estimate length (including perimeter/circumference), area, volume, weight/mass, and angles (0° to 360°) using referents
7.8.04 Solve problems involving the volume or surface area of a right rectangular prism, right circular cylinder, or composite shape using an appropriate formula or strategy
7.8.05 Solve problems involving unit conversions <u>within the same measurement system</u> for length, weight/mass, capacity, square units, and measures expressed as rates (e.g., converting feet/second to yards/minute)
7.8.06 Solve problems involving scale drawings, maps, and indirect measurement (e.g., determining the height of a building by comparing its known shadow length to the known height and shadow length of another object)

Goal #9 Geometry

9.8.01 Solve problems involving two- and three-dimensional shapes

9.8.02 Solve problems that require knowledge of triangle and quadrilateral properties (e.g., triangle inequality)

9.8.03 Find the length of any side of a right triangle using the Pythagorean theorem (whole number solutions)

9.8.08 Identify or analyze relationships of angles formed by intersecting lines (including parallel lines cut by a transversal) and angles formed by radii of a circle

9.8.09 Solve problems involving vertical, complementary, and supplementary angles

9.8.10 Identify front, side, and top views of a three-dimensional solid built with cubes

9.8.11 Solve problems involving congruent and similar figures

Mathematics Curriculum Framework – Grade 8

Month March

Goal #6 Number Sense

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
6.8.09 Solve problems and number sentences involving addition, subtraction, multiplication, and division using rational numbers, exponents, and roots
6.8.10 Apply order of operations to simplify numeric expressions involving integers (including exponents and roots), fractions, and decimals

Goal #8 Algebra

8.8.07 Represent linear equations and quantitative relationships on a rectangular coordinate system, and interpret the meaning of a specific part of a graph
8.8.08 Translate between different representations (table, written, graphical, or pictorial) of whole number relationships and linear expressions
8.8.09 Interpret the meaning of slope and intercepts in linear situations
8.8.10 Identify, graph, and interpret up to two inequalities with a single variable (including the intersection or union of these inequalities) on a number line
8.8.11 Represent and analyze problems with linear equations and inequalities
8.8.12 Solve linear equations and inequalities in one variable over the rational numbers (e.g., $5x+7 = -13$, $4x-3 = -7x+8$, $-2x+3 > -5$)

Goal #9 Geometry

9.8.06 Represent and identify geometric figures using coordinate geometry, including those resulting from transformations

9.8.07 Analyze the results of a combination of transformations, and determine a different transformation that could produce the same result

Mathematics Curriculum Framework – Grade 8

Month April

Goal #6 Number Sense

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
6.8.15 Use ratios to describe problem situations
6.8.16 Use proportional reasoning to model and solve problems
6.8.18 Solve number sentences and problems involving fractions, decimals, and percents (e.g., percent increase and decrease, interest rates, tax, discounts, tips)

Goal #8 Algebra

8.8.01 Analyze, extend, and create sequences or linear functions, and determine algebraic expressions to describe the n^{th} term of a sequence
8.8.06 Recognize, describe, and extend patterns using rate of change

Goal #9 Geometry

9.8.11 Solve problems involving congruent and similar figures

Mathematics Curriculum Framework – Grade 8

Month May/June

All Goals

Objective
SD161 Know how and when to use a calculator
SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator
SD161 Solve problems using: <u>Inequalities</u> <ul style="list-style-type: none">• Solve and graph single inequalities (include and/or statements)• Solve and graph systems of inequalities• Absolute-value inequalities
SD161 Solve problems using: <u>Systems of Equations</u> <ul style="list-style-type: none">• Graphing• Substitution• Elimination (+, -, x)
SD161 Solve problems using: <u>Quadratic Formula</u> <ul style="list-style-type: none">• $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
SD161 Solve problems using: Add, subtract, and multiply polynomials