

**Flossmoor School District 161
Mathematics Curriculum Framework
Grade 7**

Month August/September
(**BOLD denotes Advanced Objectives**)

Goal #6 Number Sense

| Objective |
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| 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 Construct angles, perpendicular lines, parallel lines |
| 6.7.04 Represent repeated factors using exponents |
| 6.7.07 Solve problems involving descriptions of numbers, including characteristics and relationships (e.g., square numbers, prime/composite, prime factorization, greatest common factor, least common multiple) including integers, variables) |
| 6.7.09 Identify and apply order of operations to simplify numeric expressions involving whole numbers (including exponents), fractions, and decimals (including integers, variables) |
| 6.7.11 Demonstrate and apply the relationships between addition/subtraction and multiplication/division with rational numbers |

Goal #7 Measurement

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| 7.7.01 Select and use appropriate standard units and tools to measure length, mass/weight, and angles. Sketch, with given specifications, line segments, angles, triangles, and quadrilaterals |
| 7.7.02 Solve problems involving the perimeter of polygons and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description) |

Goal #8 Algebra

8.7.08 Translate between different representations (table, written, graphical, or pictorial) of whole number relationships and linear expressions

Goal #9 Geometry

9.7.03 Solve problems using properties of triangles and quadrilaterals (e.g., opposite sides of a parallelogram are congruent) **(including complex figures)**

9.7.04 Identify, describe, and determine the radius and diameter of a circle **(including chord, arc, semicircle)**

Mathematics Curriculum Framework – Grade 7

Month October

(**BOLD** denotes Advanced Objectives)

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 |
| 6.7.08 Solve problems and number sentences involving addition, subtraction, multiplication, and division using integers, fractions, and decimals |
| 6.7.10 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 |

Goal #8 Algebra

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| 8.7.01 Determine a missing term in a sequence, extend a sequence, and construct and identify a rule that can generate the terms of an arithmetic or geometric sequence |
| 8.7.02 Write an expression using variables to represent unknown quantities. |
| 8.7.03 Simplify algebraic expressions by identifying and combining like terms (including complex multi-step expressions with rational numbers) |
| 8.7.04 Recognize equivalent forms of algebraic expressions |
| 8.7.05 Evaluate or simplify algebraic expressions with one or more integer variable values (e.g., $a^2 + b$ for $a = 3$ and $b = -4$) (including complex expressions e.g. $p^m q^n + 4$) |
| 8.7.06 Determine how a change in one variable relates to a change in a second variable |

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| 8.7.07 Represent linear equations and quantitative relationships on a rectangular coordinate system, and interpret the meaning of a specific part of a graph |
| 8.7.09 Identify, graph, and interpret inequalities on a number line |
| 8.7.10 Represent and analyze problems with linear equations and inequalities |
| 8.7.11 Solve linear equations and inequalities in one variable (e.g., $2x + 3 = 13$, $2x < 6$, $x + 7 > 10$) (including variables on both sides e.g. $10 + \frac{3}{4}a > \frac{-7}{8}a + 5$) |
| 8.7.12 Solve word problems involving unknown quantities |

Goal #9 Geometry

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| 9.7.08 Identify or analyze relationships of angles formed by intersecting lines (including multiple transversals) |
| 9.7.09 Identify and sketch acute, right, and obtuse angles |
| 9.7.10 Solve problems involving complementary and supplementary angles (including complex figures) |

Mathematics Curriculum Framework – Grade 7

Month November

(**BOLD** denotes Advanced Objectives)

Goal #7 Measurement

| Objective |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7.7.01 Select and use appropriate standard units and tools to measure length, mass/weight, capacity, and angles. Sketch, with given specifications, line segments, angles, triangles, and quadrilaterals |
| 7.7.02 Solve problems involving the perimeter and area of polygons and composite figures using diagrams, models, and grids or by measuring or using given formulas (may include sketching a figure from its description) |

Goal #8 Algebra

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|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 Represent systems of equations and inequalities on a Cartesian Coordinate Plane) |
| 8.7.07 Represent linear equations and quantitative relationships on a rectangular coordinate system, and interpret the meaning of a specific part of a graph |
| 8.7.12 Solve word problems involving unknown quantities |

Goal #9 Geometry

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| 9.7.01 Classify, describe, and sketch regular and irregular two-dimensional shapes according to the number of sides, length of sides, number of vertices, and interior angles |
| 9.7.05 Graph points, and identify coordinates of points on the Cartesian coordinate plane (all four quadrants) |
| 9.7.06 Represent and identify geometric figures using coordinate geometry |
| 9.7.15 Determine the distance between two points on a horizontal or vertical number line |

Mathematics Curriculum Framework – Grade 7

Month December
(**BOLD** denotes Advanced Objectives)

Goal #6 Number Sense

| Objective |
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| SD161 Know how and when to use a calculator |
| SD161 Use estimation to judge the reasonableness of an answer, with or without a calculator |
| 6.7.17 Solve number sentences and problems involving fractions, decimals, and percents (e.g., 50% of 10 is the same as $\frac{1}{2}$ of 10 is the same as 0.5×10 , sales tax, tips, interest, discounts) (including percent of increase and decrease, commissions, royalties, and compound interest) |

Goal #10 Data Analysis, Statistics, and Probability

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| 10.7.06 Solve problems involving the probability of a simple or compound event, including representing the probability as a fraction, decimal, or percent |
| 10.7.07 Represent all possible outcomes for simple events (including independent and dependent events, odds, and mutually exclusive events) |
| 10.7.08 Solve simple problems involving the number of ways objects can be arranged (permutations and combinations) |

Mathematics Curriculum Framework – Grade 7

Month January

(**BOLD** denotes Advanced Objectives)

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 |
| SD161 Identify and analyze the relationships between parts of right triangles (e.g. Pythagorean Theorem, Special Right Triangles, Trigonometric Ratios) |
| 6.7.12 Make estimates appropriate to a given situation, and analyze what effect the estimation method used has on the accuracy of results |
| 6.7.13 Estimate the square root of a number less than 1,000 between two whole numbers (e.g., $\sqrt{41}$ is between 6 and 7) |
| 6.7.15 Use proportional reasoning to model and solve problems |

Goal #7 Measurement

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| 7.7.06 Solve problems involving scale drawings and maps |
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Goal #8 Algebra

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|---------------------------------------------------------|
| 8.7.12 Solve word problems involving unknown quantities |
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Goal #9 Geometry

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| 9.7.07 Analyze the results of a combination of transformations |
| 9.7.13 Describe the difference between congruence and similarity |
| 9.7.14 Determine if figures are similar, and identify relationships between corresponding parts of similar figures |

Mathematics Curriculum Framework – Grade 7

Month February

(**BOLD** denotes Advanced Objectives)

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 |
| 6.7.01 Read, write, and recognize equivalent representations of integer powers of 10 |
| 6.7.02 Read, write, recognize, model, and interpret integers, including translating numerical expressions |
| 6.7.03 Recognize, translate between, and apply multiple representations of rational numbers (decimals, fractions, mixed numbers, and percents less than 100%) |
| 6.7.05 Order and compare integers, terminating decimals, fractions, and mixed numbers |
| 6.7.06 Identify and locate integers, decimals, and fractions/mixed numbers on a number line, and estimate the locations of square roots |
| 6.7.08 Solve problems and number sentences involving addition, subtraction, multiplication, and division using integers, fractions, and decimals |
| 6.7.09 Apply order of operations to simplify numeric expressions involving whole numbers (including exponents), fractions, and decimals |
| 6.7.13 Estimate the square root of a number less than 1,000 between two whole numbers (e.g., $\sqrt{41}$ is between 6 and 7) |
| 6.7.14 Create and explain ratios that represent a given situation (including complex fractions) |
| 6.7.16 Read, write, recognize, model, and interpret percents from 0% to 100% (including fractional percents and percents over 100) |

Goal #7 Measurement

7.7.03 Compare and estimate length (including perimeter), area, volume, weight/mass, and angles (0° to 180°) using referents

7.7.04 Determine the volume and surface area of a right rectangular prism using an appropriate formula or strategy (**including prisms, cylinders, spheres, irregular figures**)

7.7.05 Solve problems involving unit conversions within the same measurement system for length, weight/mass, capacity, and square units (e.g., $1 \text{ ft}^2 = 144 \text{ in}^2$)

Goal #9 Geometry

9.7.02 Solve problems involving two- and three-dimensional shapes (**including spheres**)

9.7.11 Identify a three-dimensional object from its net

9.7.12 Recognize which attributes (such as shape, perimeter, and area) change or don't change when plane figures are composed, decomposed, or rearranged

Mathematics Curriculum Framework – Grade 7

Month March

(**BOLD** denotes Advanced Objectives)

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 |
| 10.7.01 Read, interpret, and make predictions from data represented in a bar graph, line (dot) plot, Venn diagram (with two circles), chart/table, line graph, scatterplot, circle graph, or histogram (including Venn diagrams with three circles, stem and leaf plots and find patterns) |
| 10.7.02 Compare different representations of the same data |
| 10.7.03 Create a bar graph, chart/table, line graph, or circle graph for a given set of data |
| 10.7.04 Identify a reasonable approximation of the line of best fit from a set of data or a scatter plot |
| 10.7.05 Determine and use the mode, range, median, and mean to interpret data |
| 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 (include stem and leaf and box and whiskers plots) |
| 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 (including frequency distribution) |

Mathematics Curriculum Framework – Grade 7

Month April

(**BOLD** denotes Advanced Objectives)

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 |
| 7.8.04 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) (including within different measurement systems) |

Goal #9 Geometry

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| 9.8.02 Solve problems that require knowledge of triangle and quadrilateral properties (e.g., triangle inequality) |
| 9.8.03 Identify the length of any side of a right triangle using the Pythagorean Theorem (whole number solutions) (including trigonometric ratios) |
| 9.8.04 Identify, describe, and determine the radius, diameter, and circumference of a circle and their relationship to each other and to pi (including chords) |
| 9.8.09 Solve problems involving vertical, complementary, and supplementary angles (including at least one transversal) |

Mathematics Curriculum Framework – Grade 7

Month May/June
(BOLD denotes Advanced Objectives)

Goal #8 Algebra

| 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 |
| 8.8.02 Write an expression using variables to represent unknown quantities |
| 8.8.05 Evaluate or simplify algebraic expressions with one or more rational variable values (e.g., $3a^2 - b$ for $a = 3$ and $b = 7$) (including multi-step equations and inequalities, and those with variables on both sides) |
| 8.8.12 Solve linear equations and inequalities in one variable over the rational numbers (e.g., $5x+7 = -13$, $4x-3 = -7x+8$, $-2x+3 > -5$) (including multi-step equations and inequalities, and those with variables on both sides) |
| 8.18.13 Solve word problems involving unknown quantities |