

# Groveport Madison Local School District

## Seventh Grade Math Content Standards

### Planning Sheets

**Standard: Data Analysis & Probability**

**1st**

**2nd**

**3rd**

**4th**

**9 wks**

**9 wks**

**9wks**

**9 wks**

<b>Standard: Data Analysis &amp; Probability</b>	<b>1st</b>	<b>2nd</b>	<b>3rd</b>	<b>4th</b>
	<b>9 wks</b>	<b>9 wks</b>	<b>9wks</b>	<b>9 wks</b>
<b>A. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate.</b>				
1. Read, construct and interpret box-and-whisker plots, stem-and-leaf plots, and other types of graphs, when appropriate.				✓
<b>B. Interpret data by looking for patterns and relationships, draw and justify conclusions, and answer related questions.</b>				
4. Construct opposing arguments based on analysis of the same data, using different graphical representations.				✓
<b>C. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.</b>				
<b>D. Compare increasingly complex displays of data, such as multiple sets of data on the same graph.</b>				
5. Compare data from two or more samples to determine how sample selection can influence results.				✓
<b>E. Collect, organize, display, and interpret data for a specific purpose or need.</b>				
2. Analyze how decisions about graphing affect the graphical representation; e.g., scale, size of classes in a histogram.				✓
<b>F. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data.</b>				
3. Analyze a set of data by using and comparing combinations of measures of center (mean, mode, median) and measures of spread (range, quartile, inter-quartile range), and describe how the inclusion or exclusion of outliers affects those measures.				✓
<b>G. Evaluate conjectures and predictions based upon data presented in tables an graphs, and identify misuses of statistical data and displays.</b>				
2. Analyze how decisions about graphing affect the graphical representation; e.g., scale, size of classes in a histogram.				✓
<b>H. Find all possible outcomes of simple experiments or problem situations, using methods such as lists, arrays and tree diagrams.</b>				
<b>I. Describe the probability of an event using ratios, including fractional notation.</b>				
7. Compute probabilities of compound events; e.g. multiple coin tosses or multiple rolls of number cubes, using such methods as organized lists, tree diagrams and area models.				✓
<b>J. Compare experimental and theoretical results for a variety of simple experiments.</b>				
<b>K. Make and justify predictions based on experimental and theoretical probabilities</b>				
8. Make predictions based on theoretical probabilities, design and conduct an experiment to test the predictions, compare actual results to predicted results, and explain differences.				✓

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Standard: Geometry and Spatial Sense

	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
<b>A. Identify and label angle parts and the regions defined within the plane where the angle resides.</b>				
<b>B. Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference.</b>				
<b>C. Specify locations and plot ordered pairs on a coordinate plane.</b>				
<b>D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.</b>				
2. Determine sufficient (not necessarily minimal) properties that define a specific two-dimensional figure or three-dimensional object. For example:		✓		
a. Determine when one set of figures is a subset of another; e.g. all squares are rectangles.		✓		
b. Develop a set of properties that eliminates all but desired figure; e.g., only squares are quadrilaterals with all sides congruent and all angles congruent.		✓		
<b>E. Use proportions to express relationships among corresponding parts of similar figures.</b>				
1. Use proportional reasoning to describe and express relationships between parts and attributes of similar and congruent figures.		✓		
6. Determine and use scale factors for similar figures to solve problems using proportional reasoning.		✓		
<b>F. Describe and use the concepts of congruence, similarity and symmetry to solve problems.</b>				
4. Determine necessary conditions for congruence of triangles.		✓		
7. Identify the line and rotation symmetries of two-dimensional figures to solve problems.			✓	
<b>G. Describe and use properties of triangles to solve problems involving angle measures and side lengths of right triangles.</b>				
3. Use and demonstrate understanding of the properties triangles. For example:			✓	
a. Use Pythagorean Theorem to solve problems involving right triangles.			✓	
b. Use triangle angle sum relationships to solve problems.			✓	
5. Apply properties of congruent or similar triangles to solve problems involving missing lengths and angle measures.		✓		
<b>H. Predict and describe results (size, position, orientation) of transformations of two-dimensional figures.</b>				
8. Perform translations, reflections, rotations and dilations of two-dimensional figures using a variety of methods (paper folding, tracing, graph paper)			✓	
<b>I. Identify and draw three-dimensional objects from different views (top, side, front and perspective).</b>				
9. Draw representations of three-dimensional geometric object from different views.			✓	

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**Standard: Geometry and Spatial Sense**

**1st**  
**9 wks**

**2nd**  
**9 wks**

**3rd**  
**9wks**

**4th**  
**9 wks**

<b>J. Apply properties of equality and proportionality to solve problems involving congruent or similar figures; e.g., create a scale drawing.</b>				
1. Use proportional reasoning to describe and express relationships between parts and attributes of similar and congruent figures.		✓		
6. Determine and use scale factors for similar figures to solve problems using proportional reasoning.		✓		

# Groveport Madison Local School District

## Seventh Grade Math Content Standards

### Planning Sheets

Standard: Measurement Standard

1st  
9 wks

2nd  
9 wks

3rd  
9wks

4th  
9 wks

<b>A. Select appropriate units to measure angles, circumference, surface area, mass and volume, using:</b>				
<ul style="list-style-type: none"> <li>• U.S. customary units; e.g., degrees, square feet, pounds, and other units as appropriate;</li> <li>• Metric units; e.g., square meters, kilograms and other units as appropriate.</li> </ul>				
1. Select appropriate units for measuring derived measurements: e.g. miles per hour, revolutions per minute.		✓		
<b>B. Convert units of length, area, volume, mass and time within the same measurement system.</b>				
2. Convert units of area and volume within the same measurement system using proportional reasoning and a reference table when appropriate; e.g., square feet to square yards, cubic meters to cubic centimeters.			✓	
<b>C. Identify appropriate tools and apply appropriate techniques for measuring angles, perimeter or circumference and area of triangles, quadrilaterals, circles, and composite shapes, and surface area and volume of prisms and cylinders.</b>				
6. Use strategies to develop formulas for finding area of trapezoids and volume of cylinders and prisms.			✓	
7. Develop strategies to find the area of composite shapes using the areas of triangles, parallelograms, circles and sectors.			✓	
<b>D. Select a tool and measure accurately to a specified level of precision.</b>				
3. Estimate a measurement to a greater degree of precision than the tool provides.			✓	
<b>E. Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature.</b>				
4. Solve problems involving proportional relationships and scale factors; e.g. scale models that require unit conversions within the same measurement system.		✓		
<b>F. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.</b>				
9. Describe what happens to the surface area and volume of a three-dimensional object when the measurements of the object are changed; e.g., length of sides are doubled.			✓	
<b>G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.</b>				
8. Understand the difference between surface area and volume and demonstrate that two objects may have the same surface area, but different volumes or may have the same volume, but different surface areas.			✓	

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Standard: Number, Number Sense and Operations

	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
<b>A. Represent and compare numbers less than 0 through familiar applications and extending the number line.</b>				
<b>B. Compare, order and convert among fractions, decimals and percents.</b>				
<b>C. Develop meaning for percents including percents greater than 100 and less than 1.</b>				
<b>D. Use models and pictures to relate concepts of ratio, proportion and percent.</b>				
<b>E. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results.</b>				
4. Use the order of operations and properties to simplify numerical expressions involving integers, fractions and decimals.	✓			
<b>F. Apply number system properties when performing computations.</b>				
<b>G. Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations.</b>				
9. Represent and solve problem situations that can be modeled by and solved using concepts of absolute value, exponents and square roots (for perfect squares).	✓			
<b>H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.</b>				
5. Explain the meaning and effect of adding, subtracting, multiplying and dividing integers; e.g., how adding two integers can result in a lesser value.	✓			
8. Develop and analyze algorithms for computing with percents and integers, and demonstrate fluency in their use.		✓		
<b>I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.</b>				
6. Simplify numerical expressions involving integers and use integers to solve real-life problems.	✓			
7. Solve problems using the appropriate form of a rational number (fraction, decimal or percent).		✓		
9. Represent and solve problem situations that can be modeled by and solved using concepts of absolute value, exponents and square roots (for perfect squares).	✓			

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Standard: Patterns, Functions and Algebra

	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
<b>A. Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications.</b>				
<b>B. Represent, analyze and generalize a variety of patterns and functions with tables, graphs, words and symbolic rules.</b>				
1. Represent and analyze patterns, rules and functions, using physical materials, tables, graphs and simple variable expressions.				✓
2. Generalize patterns by describing in words how to find the next term				✓
<b>C. Use variables to create and solve equations and inequalities representing problem situations.</b>				
<b>D. Use symbolic algebra to represent and explain mathematical relationships.</b>				
9. Recognize a variety of uses for variables; e.g., placeholder for an unknown quantity in an equation, generalization for a pattern, formula.				✓
<b>E. Use rules and variables to describe patterns, functions and other relationships.</b>				
3. Recognize and explain when numerical patterns are linear or nonlinear progressions; e.g., 1,3,5,7 ... is linear and 1,3,4,8,16 ... is nonlinear.				✓
<b>F. Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships.</b>				
5. Represent linear equations by plotting points in the coordinate plane.				✓
6. Represent inequalities on a number line or a coordinate plane.				✓
<b>G. Write, simplify and evaluate algebraic expressions.</b>				
7. Justify that two forms of an algebraic expression are equivalent, and recognize when an expression is simplified; e.g. $4m = m + m + m + m$ or $a 5 + 4 = 5a + 4$ .	✓			
1. Represent and analyze patterns, rules and functions with words, tables, graphs and simple variable expressions.				✓
<b>H. Solve linear equations and inequalities symbolically, graphically and numerically.</b>				
4. Create visual representations of equation-solving processes that model the use of inverse operations.				✓
<b>I. Explain how inverse operations are used to solve linear equations.</b>				
4. Create visual representations of equation-solving processes that model the use of inverse operations.				✓

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**Standard: Patterns, Functions and Algebra**

**1st**  
**9 wks**

**2nd**  
**9 wks**

**3rd**  
**9wks**

**4th**  
**9 wks**

<b>J. Use formulas in problem-solving situations</b>				
8. Use formulas in problem-solving situations.		✓		
6. Represent inequalities on a number line or a coordinate plane..			✓	
3. Recognize and explain when numerical patterns are linear or nonlinear progressions; e.g., 1,3,5,7...is linear and 1,3,4,8,16...is non linear.				✓
<b>K. Graph linear equations and inequalities.</b>				
5. Represent linear equations by plotting points in the coordinate plane.				✓
6. Represent inequalities on a number line or a coordinate plane.				✓
<b>L. Analyze functional relationships, and explain how a change in one quantity results in a change in the other.</b>				
10. Analyze linear and simple nonlinear relationships to explain how a change in one variable results in the change of another.				✓
<b>M. Approximate and interpret rates of change from graphical and numerical data.</b>				
11. Use graphing calculators or computers to analyze change; e.g., distance-time relationships.				✓

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Standard: Mathematical Process Standard

	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
A. Clarify problem-solving situation and identify potential solution processes; e.g., consider different strategies and approaches to a problem, restate problem from various perspectives.				
B. Apply and adapt problem-solving strategies to solve a variety of problems, including unfamiliar and non-routine problem situations.				
C. Use more than one strategy to solve a problem, and recognize there are advantages associated with various methods.				
D. Recognize whether an estimate or an exact solution is appropriate for a given problem situation.				
E. Use deductive thinking to construct informal arguments to support reasoning and to justify solutions to problems.				
F. Use inductive thinking to construct informal arguments to support reasoning and to justify solutions to problems.				
G. Relate mathematical ideas to one another and to other content areas; e.g., use area models for adding fractions, interpret graphs in reading, science and social studies.				
H. Use representations to organize and communicate mathematical thinking and problem solutions.				
I. Select, apply and translate among mathematical representations to solve problems; e.g., representing a number as a fraction, decimal or percent as appropriate for a problem.				
J. Communicate mathematical thinking to others and analyze the mathematical thinking and strategies of others.				
K. Recognize and use mathematical language and symbols when reading, writing and conversing with others.				