

Groveport Madison Local School District
Sixth Grade Math Content Standards
Planning Sheets

Standard: Data Analysis & Probability

1st
9 wks

2nd
9 wks

3rd
9wks

4th
9 wks

Standard: Data Analysis & Probability	1st	2nd	3rd	4th
	9 wks	9 wks	9wks	9 wks
A. Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate.				
1. Read, construct and interpret frequency tables, circle graphs and histograms.				✓
B. Interpret data by looking for patterns and relationships, draw and justify conclusions, and answer related questions.				
5. Describe the frequency distribution of a set of data, as shown in a histogram or frequency table, by general appearance or shape; e.g. number of modes, middle of data, level of symmetry, outliers.				✓
C. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.				
D. Compare increasingly complex displays of data, such as multiple sets of data on the same graph.				
3. Compare representations of the same data in different types of graphs, such as a bar graph and circle graph.				✓
E. Collect, organize, display, and interpret data for a specific purpose or need.				
2. Select, create and use graphical representations that are appropriate for the type of data collected.				✓
F. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data.				
4. Understand the different information provided by measures of center (mean, mode and median) and measures of spread (range).				✓
G. Evaluate conjectures and predictions based upon data presented in tables an graphs, and identify misuses of statistical data and displays.				
6. Make logical inferences from statistical data.				✓
H. Find all possible outcomes of simple experiments or problem situations, using methods such as lists, arrays and tree diagrams.				
I. Describe the probability of an event using ratios, including fractional notation.				
J. Compare experimental and theoretical results for a variety of simple experiments.				
K. Make and justify predictions based on experimental and theoretical probabilities				
7. Design an experiment to test a theoretical probability and explain how the results may vary.				✓

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Sixth Grade Math Content Standards

Planning Sheets

Standard: Geometry and Spatial Sense

	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
A. Identify and label angle parts and the regions defined within the plane where the angle resides.				
B. Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference.				
C. Specify locations and plot ordered pairs on a coordinate plane.				
D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.				
1. Classify and describe two-dimensional and three-dimensional geometric figures and objects by using their properties; e.g. interior angle measures, perpendicular/parallel sides, congruent angles/sides.			✓	
2. Use standard language to describe line, segment, ray, angle, skew, parallel and perpendicular.			✓	
4. Identify and define relationships between planes; i.e., parallel, perpendicular and intersecting.			✓	
E. Use proportions to express relationships among corresponding parts of similar figures.				
F. Describe and use the concepts of congruence, similarity and symmetry to solve problems.				
6. Draw similar figures that model proportional relationships; e.g. model similar figures with a 1 to 2 relationship by sketching two of the same figure, one with corresponding sides twice the length of the other.			✓	
G. Describe and use properties of triangles to solve problems involving angle measures and side lengths of right triangles.				
3. Use multiple classification criteria to classify triangles; e.g. right scalene triangle.			✓	
H. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.				
5. Predict and describe sizes, positions and orientations of two-dimensional shapes after transformations such as reflections, rotations, translations and dilations.			✓	
I. Identify and draw three-dimensional objects from different views (top, side, front and perspective).				
7. Build three-dimensional objects with cubes, and sketch the two-dimensional representations of each side; i.e. projection sets.			✓	
J. Apply properties of equality and proportionality to solve problems involving congruent or similar figures; e.g., create a scale drawing.				
6. Draw similar figures that model proportional relationships; e.g. model similar figures with a 1 to 2 relationship by sketching two of the same figure, one with corresponding sides twice the length of the other.			✓	

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Sixth Grade Math Content Standards

Planning Sheets

Standard: Measurement Standard

	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
A. Select appropriate units to measure angles, circumference, surface area, mass and volume, using:				
<ul style="list-style-type: none"> • U.S. customary units; e.g., degrees, square feet, pounds, and other units as appropriate; • Metric units; e.g., square meters, kilograms and other units as appropriate. 				
B. Convert units of length, area, volume, mass and time within the same measurement system.				
5. Understand the difference between perimeter and area, and demonstrate that two shapes may have the same perimeter, but different areas or may have the same area, but different perimeters.			✓	
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.				
2. Use strategies to develop formulas for finding circumference and area of circles, and to determine the area of sectors; e.g., 1/2 circle, 2/3 circle, 1/3 circle, 1/4 circle.			✓	
3. Estimate perimeter or circumference and area for circles, triangles and quadrilaterals, and surface area and volume for prisms and cylinders by:			✓	
a. estimating lengths using string or links, areas using tiles or grid, and volumes using cubes;			✓	
b. measuring attributes (diameter; side lengths, or heights) and using established formulas for circles, triangles, rectangles, parallelograms and rectangular prisms.			✓	
D. Select a tool and measure accurately to a specified level of precision.				
E. Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature.				
4. Determine which measure (perimeter, area, surface area, volume) matches the context for a problem situation; e.g., perimeter is the context for fencing a garden, surface area is the context for painting a room.			✓	
F. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.				
1. Understand and describe the difference between surface area and volume.			✓	
6. Describe what happens to the perimeter and area of a two-dimensional shape when the measurements of the shape are changed; e.g. length of sides are doubled.			✓	
G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.				
1. Understand and describe the difference between surface area and volume.			✓	
5. Understand the difference between perimeter and area, and demonstrate that two shapes may have the same perimeter, but different areas or may have the same area, but different perimeters.			✓	

Groveport Madison Local School District
Sixth Grade Math Content Standards
Planning Sheets

Standard: Number, Number Sense and Operations

	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
A. Represent and compare numbers less than 0 through familiar applications and extending the number line.				
B. Compare, order and convert among fractions, decimals and percents.				
C. Develop meaning for percents including percents greater than 100 and less than 1.				
4. Describe what it means to find a specific percent of a number, using real-life examples.		✓		
5. Use models and pictures to relate concepts of ratio, proportion and percent, including percents less than 1 and greater than 100.		✓		
D. Use models and pictures to relate concepts of ratio, proportion and percent.				
3. Explain why a number is referred to as being “rational,” and recognize that the expression a/b can mean a parts of size $1/b$ each, a divided by b or the ration of a to b .		✓		
5. Use models and pictures to relate concepts of ration, proportion and percent, including percents less that 1 and greater than 100.		✓		
9. Give examples of how ratios are used to represent comparisons: e.g. part-to-part, part-to-whole, whole-to part.		✓		
E. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results.				
6. Use the order of operations, including the use of exponents, decimals and rational numbers, to simplify numerical expressions.		✓		
F. Apply number system properties when performing computations.				
G. Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations.				
1. Decompose and recompose whole numbers using factors and exponents (e.g. $32 = 2 \times 2 \times 2 \times 2 = 2^5$), and explain why “squared” means “second power” and “cubed” means “third power”.	✓			
2. Find and use the prime factorization of composite numbers. For example:				
a. Use the prime factorization to recognize the greatest common factor (GCF).	✓			
b. Use the prime factorization to recognize the least common multiple (LCM).	✓			
c. Apply the prime factorization to solve problems and explain solutions.	✓			

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Planning Sheets

Standard: Number, Number Sense and Operations

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9wks

4th
9 wks

Standard: Number, Number Sense and Operations	1st 9 wks	2nd 9 wks	3rd 9wks	4th 9 wks
H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.				
8. Represent multiplication and division situations involving fractions and decimals with models and visual representations; e.g. show with pattern blocks what it means to take $2 \frac{2}{3} \div \frac{1}{6}$.	✓			
12. Develop and analyze algorithms for computing with fractions and decimals and demonstrate fluency in their use.	✓			
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.				
7. Use simple expressions involving integers to represent and solve problems; e.g., if a running back loses 15 yards on the first carry but gains 8 yards on the second carry, what is the net gain/loss?	✓			
11. Perform fraction and decimal computations and justify their solutions; e.g. using manipulatives, diagrams, mathematical reasoning.	✓			
13. Estimate reasonable solutions to problem situations involving fractions and decimals; e.g. $\frac{7}{8} \div \frac{12}{13} = 2$ and $4.23 \times 5.8 = 25$.	✓			
14. Use proportional reasoning, ratios and percents to represent problem situations and determine the reasonableness of solutions.	✓			
15. Determine the percent of a number and solve related problems; e.g. find the percent markdown if the original price was \$140, and the sale price is \$100.	✓			

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Sixth Grade Math Content Standards

Planning Sheets

Standard: Patterns, Functions and Algebra

1st

2nd

3rd

4th

9 wks

9 wks

9wks

9 wks

Standard: Patterns, Functions and Algebra	1st	2nd	3rd	4th
	9 wks	9 wks	9wks	9 wks
A. Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications.				
1. Represent and analyze patterns, rules and functions, using physical materials, tables and graphs.		✓		
2. Use words and symbols to describe numerical and geometric patterns, rules and functions.		✓		
B. Represent, analyze and generalize a variety of patterns and functions with tables, graphs, words and symbolic rules.				
C. Use variables to create and solve equations and inequalities representing problem situations.				
5. Produce and interpret graphs that represent the relationship between two variables.		✓		
6. Evaluate simple expressions by replacing variables with given values, and use formulas in problem-solving situations.				
D. Use symbolic algebra to represent and explain mathematical relationships.				
3. Recognize and generate equivalent forms of algebraic expressions, and explain how the commutative, associative and distributive properties can be used to generate equivalent forms; e.g., perimeter as $2(l + w)$ or $2l + 2w$.		✓		
E. Use rules and variables to describe patterns, functions and other relationships.				
2. Use words and symbols to describe numerical and geometric patterns, rules and functions.		✓		
F. Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships.				
G. Write, simplify and evaluate algebraic expressions.				
6. Evaluate simple expressions by replacing variables with given values, and use formulas in problem-solving situations.		✓		
H. Solve linear equations and inequalities symbolically, graphically and numerically.				
4. Solve simple linear equations and inequalities using physical models, paper and pencil, tables and graphs.			✓	
I. Explain how inverse operations are used to solve linear equations.				
J. Use formulas in problem-solving situations				
2. Use strategies to develop formulas for finding circumference and area of circles, and to determine the area of sectors; e.g. $\frac{1}{2}$ circle, $\frac{2}{3}$ circle, $\frac{1}{3}$ circle, $\frac{1}{4}$ circle. (Measurement Standard)				
6. Evaluate simple expressions by replacing variables with given values, and use formulas in problem-solving situations.		✓		
K. Graph linear equations and inequalities.				
4. Solve simple linear equations and inequalities using physical models, paper and pencil, tables and graphs.				✓
5. Produce and interpret graphs that represent the relationship between two variables.				✓

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Standard: Patterns, Functions and Algebra

1st
9 wks

2nd
9 wks

3rd
9wks

4th
9 wks

L. Analyze functional relationships, and explain how a change in one quantity results in a change in the other.				
7. Identify and describe situations with constant or varying rates of change, and compare them.				
M. Approximate and interpret rates of change from graphical and numerical data.				
8. Use technology to analyze change; e.g. use computer applications or graphing calculators to display and interpret rate of change.				

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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.				

Note: The benchmarks for mathematical processes articulate what students should demonstrate in problem solving, representation, communication, reasoning and connections at key points in their mathematics program. Specific grade-level indicators have not been included for the mathematical processes standard because content and processes should be interconnected at the indicator level. Therefore, mathematical processes have been embedded within the grade-level indicators for the five content standards.