

Groveport Madison Local School District

Fifth Grade Math Content Standards

Planning Sheets

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 line graphs.	✓			
B. Interpret data by looking for patterns and relationships, draw and justify conclusions, and answer related questions.				
C. Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.				
5. Modify initial conclusions, propose and justify new interpretations and predictions as additional data are collected.	✓			
D. Compare increasingly complex displays of data, such as multiple sets of data on the same graph.				
3. Read and interpret increasingly complex displays of data, such as double bar graphs.	✓			
E. Collect, organize, display, and interpret data for a specific purpose or need.				
2. Select and use a graph that is appropriate for the type of data to be displayed; e.g., numerical vs. categorical data, discrete vs. continuous data.	✓			
4. Determine appropriate data to be collected to answer questions posed by students or teach, collect and display data, and clearly communicate findings.	✓			
F. Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data.				
6. Determine and use the range, mean, median and mode, and explain what each does and does not indicate about the set of data.	✓			
G. Evaluate conjectures and predictions based upon data presented in tables an graphs, and identify misuses of statistical data and displays.				
H. Find all possible outcomes of simple experiments or problem situations, using methods such as lists, arrays and tree diagrams.				
7. List and explain all possible outcomes in a given situation.			✓	
I. Describe the probability of an event using ratios, including fractional notation.				
8. Identify the probability of events within a simple experiment, such as three chances out of eight.			✓	
9. Use 0, 1 and ratios between 0 and 1 to represent the probability of outcomes for an event, and associate the ratio with the likelihood of the outcome.			✓	
J. Compare experimental and theoretical results for a variety of simple experiments.				
10. Compare what should happen (theoretical/expected results) with what did happen (experimental/actual results) in a simple experiment.			✓	
K. Make and justify predictions based on experimental and theoretical probabilities				
11. Make predictions based on experimental and theoretical probabilities.			✓	

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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.				
2. Use standard language to describe line, segment, ray, angle, skew, parallel and perpendicular.			✓	
3. Label vertex, rays, interior and exterior for an angle.			✓	
B. Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference.				
1. Draw circles, and identify and determine relationships among the radius, diameter, center and circumference; e.g., radius is half the diameter, the ratio of the circumference of a circle to its diameter is an approximation of π .			✓	
C. Specify locations and plot ordered pairs on a coordinate plane.				
6. Extend understanding of coordinate system to include points whose x or y values may be negative numbers.			✓	
D. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.				
2. Use standard language to describe line, segment, ray, angle, skew, parallel and perpendicular.			✓	
5. Use physical models to determine the sum of the interior angles of triangles and quadrilaterals.			✓	
7. Understand that the measure of an angle is determined by the degree of rotation of an angle side rather than the length of either side.			✓	
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.				
4. Describe and use properties of congruent figures to solve problems.			✓	
G. Describe and use properties of triangles to solve problems involving angle measures and side lengths of right triangles.				
5. Use physical models to determine the sum of the interior angles of triangles and quadrilaterals.			✓	
H. Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.				
I. Identify and draw three-dimensional objects from different views (top, side, front and perspective).				
8. Predict what three-dimensional object will result from folding a two-dimensional net, then confirm the prediction by folding the net.			✓	
J. Apply properties of equality and proportionality to solve problems involving congruent or similar figures; e.g., create a scale drawing.				
4. Describe and use properties of congruent figures to solve problems.			✓	

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Fifth Grade Math Content Standards

Planning Sheets

Standard: Measurement

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. 				
1. Identify and select appropriate units to measure angles; i.e., degrees.		✓		
B. Convert units of length, area, volume, mass and time within the same measurement system.				
5. <i>Make simple unit conversions within a measurement system; e.g., inches to feet, kilograms to grams, quarts to gallons. (Grade 4)</i>				
5. Make conversions within the same measurement system while performing computations.		✓		
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.				
6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms.		✓		
7. Use benchmark angles (e.g.; 45°, 90°, 120°) to estimate the measure of angles, and use a tool to measure and draw angles.		✓		
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.				
6. <i>Write, solve and verify solutions to multi-step problems involving measurement. (Grade 4)</i>				
2. Identify paths between points on a grid or coordinate plane and compare the lengths of the paths; e.g., shortest path, paths of equal length.			✓	
F. Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed.				
3. Demonstrate and describe the differences between covering the faces (surface area) and filling the interior (volume) of three-dimensional objects.		✓		
4. Demonstrate understanding of the differences among linear units, square units and cubic units. <i>(Notes: There are instances when a grade-level indicator for one standard is linked to a benchmark for a different standard. See correlation for Patterns, Functions and Algebra (page 12) for indicator 6.</i>		✓		
G. Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.				
8. <i>Use geometric models to solve problems in other areas of mathematics, such as number (multiplication/division) and measurement (area, perimeter, border). (Geometry and Spatial Sense gr. 4)</i>				
3. Demonstrate and describe the differences between covering the faces (surface area) and filling the interior (volume) of three-dimensional objects.		✓		
4. Demonstrate understanding of the differences among linear units, square units and cubic units.		✓		

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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.				
6. Represent and compare numbers less than 0 by extending the number line and using familiar applications; e.g., temperature, owing money.	✓			
B. Compare, order and convert among fractions, decimals and percents.				
1. Use models and visual representations to develop the concept of ratio as part-to-part and part-to-whole, and the concept of percent as part-to-whole.	✓			
2. Use various forms of "one" to demonstrate the equivalence of fractions; e.g., $18/24 = 9/12$ $2/2 = 3/4$ $6/6$.	✓			
3. Identify and generate equivalent forms of fractions, decimals and percent,.	✓			
C. Develop meaning for percents including percents greater than 100 and less than 1.				
D. Use models and pictures to relate concepts of ratio, proportion and percent.				
6. Use models and visual representations to develop the concept of ratio as part-to-part and part-to-whole, and the concept of percent as part-to-whole.			✓	
E. Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results.				
8. Identify and use relationships between operations to solve problems.		✓		
9. Use order of operations, including use of parentheses, to simplify numerical expressions. (Note: There are instances when a grade-level indicator for one standard is linked to a benchmark for a different standard. See also correlation for Patterns, Functions and Algebra (page 11) for indicator 8).		✓		
F. Apply number system properties when performing computations.				
7. Use commutative, associative, distributive, identify and inverse properties to simplify and perform computations.		✓		
G. Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations.				
5. Recognize and identify perfect squares and their roots.		✓		
H. Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.				
10. Justify why fractions need common denominators to be added or subtracted.			✓	
11. Explain how place value is related to addition and subtraction of decimals; e.g. $0.2 + 0.14$; the two tenths is added to the one tenth because they are both tenths.	✓			
I. Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.				
4. Round decimals to a given place value and round fractions (including mixed numbers) to the nearest half.	✓			
12. Use physical model points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals.	✓			
13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.	✓			

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Planning Sheets

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. Justify a general rule for a pattern or a function by using physical materials, visual representations, words, tables or graphs.		✓	
2. Use calculators or computers to develop patterns, and generalize them using tables and graphs.		✓	
B. Represent, analyze and generalize a variety of patterns and functions with tables, graphs, words and symbolic rules.			
3. Use variables as unknown quantities in general rules when describing patterns and other relationships		✓	
C. Use variables to create and solve equations and inequalities representing problem situations.			
4. Create and interpret the meaning of equations and inequalities representing problem situations.		✓	
D. Use symbolic algebra to represent and explain mathematical relationships.			
E. Use rules and variables to describe patterns, functions and other relationships.			
3. Use variables as unknown quantities in general rules when describing patterns and other relationships		✓	
F. Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships.			
5. Model problems with physical materials and visual representations, and use models, graphs and tables to draw conclusions and make predictions.		✓	
G. Write, simplify and evaluate algebraic expressions.			
3. Use variables as unknown quantities in general rules when describing patterns and other relationships.		✓	
H. Solve linear equations and inequalities symbolically, graphically and numerically.			
I. Explain how inverse operations are used to solve linear equations.			
J. Use formulas in problem-solving situations			
6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms and volume of rectangular prisms.		✓	
K. Graph linear equations and inequalities.			
5. Model problems with physical materials and visual representations, and use models, graphs and tables to draw conclusions and make predictions.		✓	
L. Analyze functional relationships, and explain how a change in one quantity results in a change in the other.			
6. Describe how the quantitative change in a variable affects the value of a related variable; e.g., describe how the rate of growth varies over time, based upon data in a table or graph.		✓	
M. Approximate and interpret rates of change from graphical and numerical data.			