

Hamilton City School District
Grade Five Ohio Mathematics Grade Level Indicators

Number, Number Sense and Operations Standard		Measurement Standard	Geometry and Spatial Sense Standard	Patterns, Functions and Algebra Standard	Data Analysis and Probability Standard
<p style="text-align: center;">Number and Number Systems</p> <p>5.1. Use models and visual representation to develop the concept of ratio as part-to-part and part-to-whole, and the concept of percent as part-to-whole.</p> <p>5.2. Use various forms of “one” to demonstrate the equivalence of fractions, e.g., $\frac{18}{24} = \frac{9}{12} \times \frac{2}{2} = \frac{3}{4} \times \frac{6}{6}$.</p> <p>5.3. Identify and generate equivalent forms of fractions, decimals and percents.</p> <p>5.4. Round decimals to a given place value and round fractions (including mixed numbers) to the nearest half.</p> <p>5.5. Recognize and identify perfect squares and their roots.</p> <p style="text-align: center;">Meaning of Operations</p> <p>5.6. Represent and compare numbers less than 0 by extending the number line and using familiar applications; e.g., temperature, owing money.</p> <p>5.7. Use commutative, associative, distributive, identity and inverse properties to simplify and perform computations.</p> <p>5.8. Identify and use relationships between operations to solve problems.</p> <p>5.9. Use order of operations, including use of parentheses to simplify numerical expressions.</p> <p>5.10. Justify why fractions need common denominators to be added or subtracted.</p> <p>5.11. Explain how place value is related to addition and subtraction of decimals; e.g., $0.1 + 0.14$; the two tenths is added to the one tenth because they are both tenths.</p>	<p style="text-align: center;">Computation and Estimation</p> <p>5.12. Use physical models, points of reference, and equivalent forms to add and subtract commonly used fractions with like and unlike denominators and decimals.</p> <p>5.13. Estimate the results of computations involving whole numbers, fractions and decimals, using a variety of strategies.</p>	<p style="text-align: center;">Measurement Units</p> <p>5.1. Identify and select appropriate units to measure angles; i.e., degrees.</p> <p>5.2. 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.</p> <p>5.3. Demonstrate and describe the differences between covering the faces (surface area) and filling the interior (volume) of three-dimensional objects.</p> <p>5.4. Demonstrate understanding of the differences among linear units, square units and cubic units.</p> <p style="text-align: center;">Use Measurement Techniques and Tools</p> <p>5.5. Make conversions with the same measurement system while performing computations.</p> <p>5.6. Use strategies to develop formulas for determining perimeter and area of triangles, rectangles and parallelograms, and volume of rectangular prisms.</p> <p>5.7. Use benchmark angles (e.g.; 45°, 90°, 120°) to estimate the measure of angles, and use a tool to measure and draw angles.</p>	<p style="text-align: center;">Characteristics and Properties</p> <p>5.1. 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 n.</p> <p>5.2. Use standard language to describe line, segment, ray, angle, skew, parallel and perpendicular.</p> <p>5.3. Label vertex, rays, interior and exterior for an angle.</p> <p>5.4. Describe and use properties of congruent figures to solve problems.</p> <p>5.5. Use physical models to determine the sum of the interior angles of triangles and quadrilaterals.</p> <p style="text-align: center;">Spatial Relationships</p> <p>5.6. Extend understanding of coordinate system to include points whose x or y values may be negative numbers.</p> <p style="text-align: center;">Visualization and Geometric Models</p> <p>5.7. 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.</p> <p>5.8. Predict what three-dimensional object will result from folding a two-dimensional net, folding the net.</p>	<p style="text-align: center;">Use Patterns, Relations and Functions</p> <p>5.1. Justify a general rule for a pattern or a function by using physical materials, visual representations, words, tables or graphs.</p> <p>5.2. Use calculators or computers to develop patterns, and generalize them using tables or graphs.</p> <p style="text-align: center;">Use Algebraic Representations</p> <p>5.3. Use variables as unknown quantities in general rules when describing patterns and other relationships.</p> <p>5.4. Create and interpret the meaning of equations and other relationships.</p> <p>5.5. Model problems with physical materials and visual representations, and use models, graphs and tables to draw conclusions and make predictions.</p> <p style="text-align: center;">Analyze Change</p> <p>5.6. 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.</p>	<p style="text-align: center;">Data Collection</p> <p>5.1. Read, construct and interpret frequency tables, circle graphs and line graphs.</p> <p>5.2. 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.</p> <p>5.3. Read and interpret increasingly complex displays of data, such as double bar graphs.</p> <p>5.4. Determine appropriate data to be collected to answer questions posed by students or teacher, collect and display data, and clearly communicate findings.</p> <p>5.5. Modify initial conclusions, propose and justify new interpretations and predictions as additional data are collected.</p> <p style="text-align: center;">Statistical Methods</p> <p>5.6. Determine and use the range, mean, median and mode, and explain what each does and does not indicate about the set of data.</p> <p style="text-align: center;">Probability</p> <p>5.7. List and explain all possible outcomes in a given situation.</p> <p>5.8. Identify the probability of events within a simple experiment, such as three chances out of eight.</p> <p>5.9. 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.</p> <p>5.10. Compare what should happen (theoretical/expected results) with what did happen (experimental/actual results) in a simple experiment.</p> <p>5.11. Make predictions based on experimental and theoretical probabilities.</p>

**Hamilton City School District
Grade 5 Mathematics
Vocabulary and Concept Map**

Number, Number Sense and Operations	Measurement	Geometry and Spatial Sense		Patterns, Functions and Algebra	Data Analysis and Probability		Mathematical Processes
Inverse property	Angle	Angle	Skew	Function	Categorical data	Probability	Deductive thinking
Associative property	Area	Center	Vertex	Graph	Circle graph	Range	Justify
Common denominator	Benchmark angle	Circle		Pattern	Continuous data	Theoretical probability	Problem solving strategy
Commutative property	Cubic units	Circumference		Rate of change	Discrete data		Solution
Distributive property	Degree	Congruent figures		Table of values	Double bar graph		Support
Equivalent fractions	Face	Diameter		Variable	Experimental probability		
Estimate	Interior	Exterior of an angle			Frequency table		
Order of operations	Linear units	Interior of an angle			Interpret		
Percent	Path	Line			Line graph		
Perfect square	Perimeter	Net			Mean		
Place value	Rectangular prism	Parallel			Median		
Ratio	Square units	Perpendicular			Mode		
Square root	Surface area	Radius			Numerical data		
	Volume	Ray			Possible outcomes		
		Segment			Predict		

Performance Verb	Level in Bloom's	Appearances in Grade 5 Indicators	Working Definition	<p style="text-align: center;">The importance of the word <i>EXPLAIN</i></p> <p>EXPLAIN is the most frequently used verb in short answer and extended response questions</p> <p>EXPLAIN means to make clear and understandable and to give reasons for</p> <p>When asked to EXPLAIN, the response must include sufficient quality information and proof</p> <p>EXPLAIN is at the analysis level for problem solving</p> <p>In mathematics, EXPLAIN can involve numerical proof and drawings as well as verbal explanation</p>
Compare	Level II: Comprehension	2	To examine the qualities of to discover similarities or differences	
Construct	Level III: Application	1	To set in logical order	
Create	Level III: Application	1	To make or bring into existence	
Demonstrate	Level II: Comprehension	2	To prove or make clear by reasoning or evidence	
Describe	Level I: Knowledge	2	To represent or give an account of in words	
Determine	Level IV: Analysis	2	To find out or come to a decision by investigation, reason, calculation	
Explain	Level II: Comprehension; Level IV: Analysis	1	To make plain or understandable	
Extend	Level II: Comprehension	1	To increase the scope, application, or meaning of	
Identify	Level I: Knowledge	6	To establish the identity of	
Interpret	Level II: Comprehension	3	To explain the meaning of	
Justify	Level V: Synthesis	3	To prove or show to be right or reasonable	
Model	Level III: Application	1	To produce a representation or simulation of	
Modify	Level V: Synthesis	1	To make basic or fundamental changes in	
Predict	Level III: Application	1	To foretell on the basis of observation	
Recognize	Level I: Knowledge	1	To acknowledge or perceive something	
Represent	Level III: Application	1	To form an image or representation of	
Use	Level III: Application	14	To put into action or service	