

Hamilton City School District
Grade Three 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>3.1 Identify and generate equivalent forms of whole numbers; e.g., 36, $30 + 6$, 9×4, 46 - 10, number of inches in yard.</p> <p>3.2 Use place value concepts to represent whole numbers and decimals using numerals, words, expanded notation and physical models. For example:</p> <ol style="list-style-type: none"> Recognize 100 can mean “10 tens” as well as single entity (1 hundred) through physical models and trading games. Describe the multiplicative nature of the number system; e.g., the structure of 3205 as 3×1000 plus 2×100 plus 5×1. Model the size of 1000 in multiple ways; e.g., packaging 1000 objects into 10 boxes of 100, modeling a meter with centimeter and decimeter strips, or gathering 1000 pop-can tabs. Explain the concepts of tenths and hundredths using physical models, such as metric pieces, base ten blocks, decimal squares or money. <p>3.3 Use mathematical language and symbols to compare and order; e.g., less than, greater than, at most, at least, $<$, $>$, $=$, \leq, \geq.</p> <p>3.4 Count money and make change using coins and paper bills to ten dollars.</p> <p>3.5 Represent fractions and mixed numbers using words, numerals and physical models.</p> <p>3.6 Compare and order commonly used fractions and mixed numbers using number lines, models (such as fraction circles or bars), points of reference (such as more or less than $\frac{1}{2}$), and equivalent forms using physical or visual models.</p> <p>3.7 Recognize and use decimal and fraction concepts and notations as related ways of representing parts of a whole or a set; e.g., 3 of 10 marbles are red can also be described as $\frac{3}{10}$ and 3 tenths are red.</p>	<p style="text-align: center;">Meaning of Operations</p> <p>3.8 Model, represent and explain multiplication; e.g., repeated addition, skip counting, rectangular arrays and area model. For example:</p> <ol style="list-style-type: none"> Use conventional mathematical symbols to write equations for word problems involving multiplication. Understand that, unlike addition and subtraction, the factors in multiplication and division may have different units; e.g., 3 boxes of 5 cookies each. <p>3.9 Model, represent and explain division; e.g., sharing equally, repeated subtraction, rectangular arrays and area model. For example:</p> <ol style="list-style-type: none"> Translate contextual situations involving division into conventional mathematical symbols. Explain how a remainder may impact an answer in a real-word situation; e.g., 14 cookies being shared by 4 children. <p>3.10 Explain and use relationships between operations, such as:</p> <ol style="list-style-type: none"> Relate addition and subtraction as inverse operations; Relate multiplication and division as inverse operations; Relate addition to multiplication (repeated addition); Relate subtraction to division (repeated subtraction). <p>3.11 Model and use the commutative and associative properties for addition and multiplication.</p> <p style="text-align: center;">Computation and Estimation</p> <p>3.12 Add and subtract whole numbers with and without regrouping.</p> <p>3.13 Demonstrate fluency in multiplication facts through 10 and corresponding division facts.</p> <p>3.14 Multiply and divide 2- and 3-digit numbers by a single-digit number, without remainders for division.</p> <p>3.15 Evaluate the reasonableness of computations based upon operations and the numbers involved; e.g., considering relative size, place value and estimates.</p>	<p style="text-align: center;">Measurement Units</p> <p>3.1 Identify and select appropriate units for measuring:</p> <ol style="list-style-type: none"> Length-miles, kilometers and other units of measure as appropriate; Volume (capacity)-gallons; Weight-ounces, pounds, grams, or kilograms; Temperature-degrees (Fahrenheit or Celsius). <p>3.2 Establish personal or common referents to include additional units; e.g., a gallon container of milk; a postage stamp is about a square inch.</p> <p>3.3 Tell time to the nearest minute and find elapsed time using a calendar or a clock.</p> <p>3.4 Read thermometers in both Fahrenheit and Celsius scales.</p> <p style="text-align: center;">Use Measurement Techniques and Tools</p> <p>3.5 Estimate and measure length, weight and volume (capacity), using metric and U.S. customary units, accurate to the nearest $\frac{1}{2}$ or $\frac{1}{4}$ unit as appropriate.</p> <p>3.6 Use appropriate measurement tools and techniques to construct a figure or approximate an amount of specified length, weight or volume (capacity); e.g., construct a rectangle with length $2\frac{1}{2}$ inches and width 3 inches, fill a measuring cup to the $\frac{3}{4}$ cup mark.</p> <p>3.7 Make estimates for perimeter, area and volume using links, tiles, cubes and other models.</p>	<p style="text-align: center;">Characteristics and Properties</p> <p>3.1 Analyze and describe properties of two-dimensional shapes and three-dimensional objects using terms such as vertex, edge, angle, side and face.</p> <p>3.2 Identify and describe the relative size of angles with respect to right angles as follows:</p> <ol style="list-style-type: none"> Use physical models, like straws, to make different sized angles by opening and closing the sides, not by changing the side lengths. Identify, classify and draw right, acute, obtuse and straight angles. <p style="text-align: center;">Spatial Relationships</p> <p>3.3 Find and name locations on a labeled grid or coordinate system; e.g., a map or graph.</p> <p style="text-align: center;">Transformations and Symmetry</p> <p>3.4 Draw lines of symmetry to verify symmetrical two-dimensional shapes.</p> <p style="text-align: center;">Visualization and Geometric Models</p> <p>3.5 Build a three-dimensional model of an object composed of cubes; e.g., construct a model based on an illustration or actual object.</p>	<p style="text-align: center;">Use Patterns, Relations and Functions</p> <p>3.1 Extend multiplication and growing patterns, and describe the pattern or rule in words.</p> <p>3.2 Analyze and replicate arithmetic sequences with and without a calculator.</p> <p>3.3 Use patterns to make predictions, identify relationships, and solve problems.</p> <p style="text-align: center;">Use Algebraic Representations</p> <p>3.4 Model problem situations using objects, picture, tables, numbers, letters and other symbols.</p> <p>3.5 Write, solve and explain simple mathematical statements, such as $7 + \square > 8$ or $\Delta + 8 = 10$.</p> <p>3.6 Express mathematical relationships as equations and inequalities.</p> <p style="text-align: center;">Analyze Change</p> <p>3.7 Create tables to record, organize and analyze data to discover patterns and rules.</p> <p>3.8 Identify and describe quantitative changes especially those involving addition and subtraction; e.g., the height of water in a glass becoming 1 centimeter lower each week due to evaporation.</p>	<p style="text-align: center;">Data Collection</p> <p>3.1 Collect and organize data from an experiment, such as recording and classifying observations or measurements, in response to a question posed.</p> <p>3.2 Draw and interpret picture graphs in which a symbol or picture represents more than one object.</p> <p>3.3 Read, interpret and construct bar graphs with intervals greater than one.</p> <p>3.4 Support a conclusion or prediction orally and in writing, using information in a table or graph.</p> <p>3.5 Match a set of data with a graphical representation of the data.</p> <p>3.6 Translate information freely among charts, tables, line plots, picture graphs from the information in a chart.</p> <p>3.7 Analyze and interpret information represented on a timeline.</p> <p style="text-align: center;">Statistical Methods</p> <p>3.8 Identify the mode of a data set and describe the information it gives about a data set.</p> <p style="text-align: center;">Probability</p> <p>3.9 Conduct a simple experiment or simulation of a simple event, record the results in a chart, table or graph, and use the results to draw conclusions about the likelihood of possible outcomes.</p> <p>3.10 Use physical models, pictures, diagrams and lists to solve problems involving possible arrangements or combinations of two to four objects.</p>

**Hamilton City School District
Grade 3 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
Addition	Number line	Area	Ounce	Acute angle	Arithmetic sequence	Analyze	Apply
Associative property	Numeral	Capacity	Perimeter	Angle	Equation	Arrangement	Guess and check
Commutative property	Place value	Celsius	Pound	Coordinates	Growing pattern	Barr graph	Interpret
Decimal	Regroup	Centimeter	Temperature	Cube	Inequality	Chart	Justify
Digit	Subtraction	Customary	Volume	Edge	Multiplication pattern	Combination	Make an organized list
Division	Whole number	Fahrenheit	Weight	Face	Pattern	Data	Strategy
Equal		Foot		Line of symmetry	Quantitative change	Data table	
Estimate		Gram		Obtuse angle	Solve	Event	
Expanded notation		Inch		Right angle		Interval	
Fraction		Kilogram		Side		Line plot	
Greater than		Kilometer		Straight angle		Mode	
Inverse operations		Length		Symmetry		Picture graph	
Less than		Meter		Three-dimensional		Possible Outcomes	
Mixed numeral		Metric		Two-dimensional		Predict	
Multiplication		Mile		Vertex		Timeline	

Performance Verb	Level in Bloom's	Appearances in Grade 3 Indicators	Working Definition	
Analyze	Level IV: Analysis	3	To break down and determine the relationship of the parts	<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	1	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	1	To prove or make clear by reasoning or evidence	
Describe	Level I: Knowledge	2	To represent or give an account of in words	
Establish	Level II: Comprehension	1	To bring into existence	
Evaluate	Level IV: Analysis	1	To determine the value of; to determine the significance or worth	
Explain	Level II: Comprehension; Level IV: Analysis	4	To make plain or understandable	
Express	Level II: Comprehension	1	To represent in words	
Extend	Level II: Comprehension	1	To increase the scope, application, or meaning of	
Find	Level I: Knowledge	1	To discover by study	
Identify	Level I: Knowledge	5	To establish the identity of	
Interpret	Level II: Comprehension	3	To explain the meaning of	
Model	Level III: Application	4	To produce a representation or simulation of	
Recognize	Level I: Knowledge	1	To acknowledge or perceive something	
Relate	Level II: Comprehension	4	To show a logical connection between	
Represent	Level III: Application	3	To form an image or representation of	
Solve	Level III: Application	1	To find a solution for	
Support	Level IV: Analysis	1	To provide substantiation	
Translate	Level IV: Analysis	2	To express in different terms or representations	
Use	Level III: Application	8	To put into action or service	