

Introduction

This alignment summarizes the relationship between the 2001 Ohio Academic Content Standards (Ohio ACS) for Mathematics and the 2010 Common Core State Standards (CCSS) adopted by Ohio on June 7, 2010. The Crosswalk lists all of the kindergarten through high school domains and clusters and their corresponding benchmarks from the 2001 standards. This document is provided to assist curriculum specialists and teachers in reviewing their current curriculum and instruction in preparation for the transition to the CCSS. The CCSS can be found at www.corestandards.org.

The structure and organization of the standards has changed. The frameworks for the 2001 and 2010 sets of standards are not parallel. While there are clear connections between both sets of standards, there also are significant differences.

2001 Academic Content Standards for Mathematics

Standards
Benchmarks (by grade band)
Indicators (by grade)

2010 Common Core State Standards for Mathematics

<u>Grades K -8</u>	<u>High School</u>
Grade	Conceptual Category
Domain	Domain
Cluster	Cluster
Standard (Statements)	Standard (Statements)

Each grade also identifies "critical areas" of focus

This document connects the CCSS clusters and standard statements (2010) with the Ohio benchmarks (2001).

Alignments are not exact. The intent and level of expectation for each of these sets of standards varies, making it difficult to say that the connections made show full alignment.

Process

A committee of teachers, teacher educators, ESC consultants, and other mathematics professionals were brought together to assist the Ohio Department of Education in the process of identifying the connections between the 2010 CCSS and the 2001 Ohio ACS for Mathematics. This task included aligning the 2001 benchmarks to the 2010 CCSS standard statements, which are grouped by clusters.

Benchmarks may be aligned to one or several of the standard statements within a cluster. Benchmarks identified as prerequisite skills or concepts are not included as connections. Additionally, the number of benchmarks connected to a cluster does not imply any level of alignment or coverage. Finally, we caution users of this crosswalk that alignment of a benchmark to a 2010 cluster does not necessarily imply that 2001 indicators associated with the benchmark align to the same cluster.

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

How to Use This Document

The first three columns identify the Grade Level, Domain and Cluster from the 2010 Common Core State Standards for Mathematics. The fourth column identifies a corresponding benchmark(s) from 2001 Ohio Academic Content Standards for Mathematics that are aligned to the 2010 CCSS.

Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Kindergarten	Counting and Cardinality	Know number names and the count sequence.	OH.K-2.N.F Count, using numerals and ordinal numbers.
		Count to tell the number of objects.	OH.K-2.N.F Count, using numerals and ordinal numbers.
		Compare numbers.	OH.K-2.N.B Recognize, classify, compare and order whole numbers.

Reading the Ohio Code used for the benchmarks.

Ohio. Grade Band. Standard. Benchmark

The standards in the benchmark code are identified by the following notation.

- **N. – Number, Number Sense and Operations**
- **M. – Measurement**
- **G. – Geometry and Spatial Sense**
- **A. – Patterns, Functions and Algebra**
- **D. – Data Analysis and Probability**
- **P. – Mathematical Processes**

As mentioned above, the alignment between the two sets of standards is not perfect and should not be used to re-purpose curriculum and instructional materials for teaching the 2010 CCSS. This document should be used to begin the conversation and the analyses of these two sets of standards.

The transition from the current Ohio ACS to the newly adopted CCSS needs to be a thoughtful process involving professional development about the CCSS, local district analysis of what needs to be changed accompanied by the creation and implementation of a sensible plan that gradually moves toward the CCSS by 2014. It is recommended that districts begin this process after the State Board adopts the model curriculum in March 2011.

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Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Kindergarten	Counting and Cardinality	Know number names and the count sequence.	OH.K-2.N.F Count, using numerals and ordinal numbers.
		Count to tell the number of objects.	OH.K-2.N.F Count, using numerals and ordinal numbers.
		Compare numbers.	OH.K-2.N.B Recognize, classify, compare and order whole numbers.
	Operations and Algebraic Thinking	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	OH.K-2.N.G Model, represent and explain addition as combining sets and counting on.. OH.K-2.N.K Demonstrate fluency in addition facts with addends through 9 and corresponding subtractions. OH.K-2.A.D Model problem situations, using objects, pictures, numbers and other symbols.
	Number and Operations–Base Ten	Work with numbers 11-19 to gain foundations for place value.	OH.K-2.N.A Use place value concepts to represent whole numbers using numerals, words and physical models.
	Measurement and Data	Describe and compare measurable attributes.	OH.K-2.G.C Sort and compare two-dimensional figures and three-dimensional objects according to their characteristics and properties. OH.K-2.A.A Sort, classify and order objects by size, number and other properties, and describe the attributes used. OH.K-2.A.G Describe and compare qualitative and quantitative changes. OH.K-2.D.B Sort and classify objects by attributes, and organize data into categories in a simple table or chart.
		Classify objects and count the number of objects in each category.	OH.K-2.N.F Count, using numerals and ordinal numbers. OH.K-2.A.A Sort, classify and order objects by size, number and other properties, and describe the attributes used. OH.K-2.D.A Pose questions and gather data about everyday situations and familiar objects. OH.K-2.D.B Sort and classify objects by attributes, and organize data into categories in a simple table or chart.
	Geometry	Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).	OH.K-2.G.A Describe and create plane figures: circle, rectangle, square, triangle, hexagon, trapezoid, parallelogram and rhombus, and identify them in the environment. OH.K-2.G.B Describe solid objects: cube, rectangular prism, sphere, cylinder, cone and pyramid, and identify them in the environment. OH.K-2.G.C Sort and compare two-dimensional figures and three-dimensional objects according to their characteristics and properties. OH.K-2.G.D Identify, explain and model (superposition, copying) the concept of shapes being congruent and similar. OH.K-2.G.E Recognize two- and three-dimensional objects from different positions.
		Analyze, compare, create, and compose shapes.	OH.K-2.G.A Describe and create plane figures: circle, rectangle, square, triangle, hexagon, trapezoid, parallelogram and rhombus, and identify them in the environment. OH.K-2.G.B Describe solid objects: cube, rectangular prism, sphere, cylinder, cone and pyramid, and identify them in the environment. OH.K-2.G.C Sort and compare two-dimensional figures and three-dimensional objects according to their characteristics and properties. OH.K-2.G.D Identify, explain and model (superposition, copying) the concept of shapes being congruent and similar. OH.K-2.G.E Recognize two- and three-dimensional objects from different positions.

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Grade	Domain	Cluster	Benchmark
Grade One	Operations and Algebraic Thinking	Represent and solve problems involving addition and subtraction.	OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions. OH.K-2.P.H Recognize the mathematical meaning of common words and phrases, and relate everyday language to mathematical language and symbols.
		Understand and apply properties of operations and the relationship between addition and subtraction.	OH.K-2.N.K Demonstrate fluency in addition facts with addends through 9 and corresponding subtractions. OH.K-2.N.M Add and subtract two-digit numbers with and without regrouping.
		Add and subtract within 20.	OH.K-2.N.G Model, represent and explain addition as combining sets and counting on. OH.K-2.N.H Model, represent and explain subtraction as comparison, take-away and part-to-whole. OH.K-2.N.K Demonstrate fluency in addition facts with addends through 9 and corresponding subtractions. OH.K-2.N.L Demonstrate fluency in adding and subtracting multiples of 10, and recognize combinations that make 10.
		Work with addition and subtraction equations.	OH.K-2.A.E Solve open sentences and explain strategies.
	Number and Operations–Base Ten	Extend the counting sequence	No Aligned Benchmarks
		Understand Place value	No Aligned Benchmarks
	Measurement and Data	Use place value understanding and properties of operations to add and subtract.	OH.K-2.P.A Use a variety of strategies to understand problem situations; e.g., discussing with peers, stating problems in own words, modeling problems with diagrams or physical materials, identifying a pattern. OH.K-2.P.E Explain to others how a problem was solved. OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions. OH.K-2.P.I Communicate mathematical thinking by using everyday language and appropriate mathematical language.
		Measure lengths indirectly and by iterating length units.	OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions.
		Tell and write time.	OH.K-2.M.C Develop common referents for units of measure for length, weight, volume (capacity) and time to make comparisons and estimates.
	Geometry	Represent and interpret data.	OH.K-2.A.G Describe and compare qualitative and quantitative changes. OH.K-2.D.C Represent data using objects, picture graphs and bar graphs.
			Reason with shapes and their attributes.

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Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Grade Two	Operations and Algebraic Thinking	Represent and solve problems involving addition and subtraction.	<p>OH.K-2.N.G Model, represent and explain addition as combining sets and counting on.</p> <p>OH.K-2.N.H Model, represent and explain subtraction as comparison, take-away and part-to-whole.</p> <p>OH.K-2.N.M Add and subtract two-digit numbers with and without regrouping.</p> <p>OH.K-2.A.D Model problem situations, using objects, pictures, numbers and other symbols.</p> <p>OH.K-2.A.F Represent an unknown quantity as a variable using a symbol, such as \square, Δ, O</p> <p>OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions.</p> <p>OH.K-2.P.G Use invented and conventional symbols and common language to describe a problem situation and solution.</p>
		Add and subtract within 20.	OH.K-2.N.K Demonstrate fluency in addition facts with addends through 9 and corresponding subtractions.
		Work with equal groups of objects to gain foundations for multiplication.	<p>OH.K-2.N.B Recognize, classify, compare and order whole numbers.</p> <p>OH.K-2.N.I Model, represent and explain multiplication as repeated addition, rectangular arrays and skip counting.</p> <p>OH.K-2.A.D Model problem situations, using objects, pictures, numbers and other symbols.</p> <p>OH.K-2.P.G Use invented and conventional symbols and common language to describe a problem situation and solution.</p>
	Number and Operations–Base Ten	Understand place value.	<p>OH.K-2.N.A Use place value concepts to represent whole numbers using numerals, words and physical models.</p> <p>OH.K-2.N.B Recognize, classify, compare and order whole numbers.</p> <p>OH.K-2.N.F Count, using numerals and ordinal numbers.</p> <p>OH.3-4.N.A Use place value structure of the base-ten number system to read, write, represent and compare whole numbers and decimals.</p>
Use place value understanding and properties of operations to add and subtract.		<p>OH.K-2.N.L Demonstrate fluency in adding and subtracting multiples of 10, and recognize combinations that make 10.</p> <p>OH.K-2.N.M Add and subtract two-digit numbers with and without regrouping.</p> <p>OH.K-2.P.E Explain to others how a problem was solved.</p> <p>OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions.</p> <p>OH.K-2.P.I Communicate mathematical thinking by using everyday language and appropriate mathematical language.</p> <p>OH.3-4.N.G Model and use commutative and associative properties for addition and multiplication.</p> <p>OH.3-4.N.H Use relationships between operations, such as subtraction as the inverse of addition and division as the inverse of multiplication.</p> <p>OH.3-4.N.L Use a variety of methods and appropriate tools (mental math, paper and pencil, calculators) for computing with whole numbers.</p> <p>OH.3-4.P.K Use mathematical language to explain and justify mathematical ideas, strategies and solutions.</p>	

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Grade Two	Measurement and Data	Measure and estimate lengths in standard units.	<p>OH.K-2.M.C Develop common referents for units of measure for length, weight, volume (capacity) and time to make comparisons and estimates.</p> <p>OH.K-2.M.D Apply measurement techniques to measure length, weight and volume (capacity).</p> <p>OH.K-2.M.E Recognize that using different units of measurement will yield different numbers for the same measurement.</p> <p>OH.3-4.M.B Know that the number of units is inversely related to the size of the unit for any item being measured.</p>
		Relate addition and subtraction to length.	<p>OH.K-2.A.E Solve open sentences and explain strategies.</p> <p>OH.K-2.A.F Represent an unknown quantity as a variable using a symbol, such as \square, Δ, O</p> <p>OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions.</p> <p>OH.K-2.P.G Use invented and conventional symbols and common language to describe a problem situation and solution.</p>
		Work with time and money.	<p>OH.K-2.N.D Determine the value of a collection of coins and dollar bills.</p> <p>OH.K-2.N.E Make change using coins for values up to one dollar.</p> <p>OH.K-2.P.H Recognize the mathematical meaning of common words and phrases, and relate everyday language to mathematical language and symbols.</p> <p>OH.3-4.N.F Count money and make change using both coins and paper bills.</p>
		Represent and interpret data.	<p>OH.K-2.D.B Sort and classify objects by attributes, and organize data into categories in a simple table or chart.</p> <p>OH.K-2.D.C Represent data using objects, picture graphs and bar graphs.</p> <p>OH.3-4.D.B Read and interpret tables, charts, graphs (bar, picture, line, line plot), and timelines as sources of information, identify main idea, draw conclusions, and make predictions.</p> <p>OH.3-4.D.C Construct charts, tables and graphs to represent data, including picture graphs, bar graphs, line graphs, line plots and Venn diagrams.</p>
	Geometry	Reason with shapes and their attributes.	<p>OH.K-2.N.C Represent commonly used fractions using words and physical models.</p> <p>OH.K-2.G.A Describe and create plane figures: circle, rectangle, square, triangle, hexagon, trapezoid, parallelogram and rhombus, and identify them in the environment.</p> <p>OH.K-2.G.B Describe solid objects: cube, rectangular prism, sphere, cylinder, cone and pyramid, and identify them in the environment.</p> <p>OH.K-2.G.E Recognize two- and three-dimensional objects from different positions.</p> <p>OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions.</p> <p>OH.K-2.P.H Recognize the mathematical meaning of common words and phrases, and relate everyday language to mathematical language and symbols.</p> <p>OH.3-4.M.D Identify appropriate tools and apply counting techniques for measuring side lengths, perimeter and area of squares, rectangles, and simple irregular two-dimensional shapes, volume of rectangular prisms, and time and temperature.</p> <p>OH.3-4.P.E Link concepts to procedures and to symbolic notation; e.g., model 3×4 with a geometric array, represent one-third by dividing an object into three equal parts.</p>

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Grade	Domain	Cluster	Benchmark
Grade Three	Operations and Algebraic Thinking	Represent and solve problems involving multiplication and division.	OH.K-2.N.I Model, represent and explain multiplication as repeated addition, rectangular arrays and skip counting. OH.K-2.N.J Model, represent and explain division as sharing equally, repeated subtraction and rectangular arrays. OH.3-4.N.I Demonstrate fluency in multiplication facts with factors through 10 and corresponding divisions. OH.3-4.N.K Analyze and solve multi-step problems involving addition, subtraction, multiplication and division of whole numbers. OH.3-4.A.C Write and solve open sentences and explain strategies. OH.3-4.A.D Represent an unknown quantity as a variable using a symbol, including letters. OH.3-4.A.E Use variables to create and solve equations representing problem situations.
		Understand properties of multiplication and the relationship between multiplication and division.	OH.3-4.N.G Model and use commutative and associative properties for addition and multiplication. OH.3-4.N.H Use relationships between operations, such as subtraction as the inverse of addition and division as the inverse of multiplication.
		Multiply and divide within 100.	OH.3-4.N.J Estimate the results of whole number computations using a variety of strategies, and judge the reasonableness.
		Solve problems involving the four operations, and identify and explain patterns in arithmetic.	OH.3-4.N.K Analyze and solve multi-step problems involving addition, subtraction, multiplication and division of whole numbers. OH.3-4.A.A Analyze and extend patterns, and describe the rule in words. OH.3-4.A.C Write and solve open sentences and explain strategies. OH.3-4.A.D Represent an unknown quantity as a variable using a symbol, including letters. OH.3-4.A.E Use variables to create and solve equations representing problem situations.
	Number and Operations–Base Ten	Use place value understanding and properties of operations to perform multi-digit arithmetic.	OH.3-4.N.A Use place value structure of the base-ten number system to read, write, represent and compare whole numbers and decimals. OH.3-4.N.G Model and use commutative and associative properties for addition and multiplication. OH.3-4.N.H Use relationships between operations, such as subtraction as the inverse of addition and division as the inverse of multiplication. OH.3-4.N.L Use a variety of methods and appropriate tools (mental math, paper and pencil, calculators) for computing with whole numbers.
Number and Operations – Fractions	Develop understanding of fractions as numbers.	OH.3-4.N.B Recognize and generate equivalent representations for whole numbers, fractions and decimals. OH.3-4.N.C Represent commonly used fractions and mixed numbers using words and physical models. OH.3-4.N.D Use models, points of reference and equivalent forms of commonly used fractions to judge the size of fractions and to compare, describe and order them.	

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Grade	Domain	Cluster	Benchmark
Grade Three	Measurement and Data	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	OH.K-2.M.D Apply measurement techniques to measure length, weight and volume (capacity). OH.3-4.M.A Select appropriate units for perimeter, area, weight, volume (capacity), time and temperature, using: objects of uniform size; U.S. customary units; e.g., mile, square inch, cubic inch, second, degree Fahrenheit, and other units as appropriate OH.3-4.M.C Develop common referents for units of measure for length, weight, volume (capacity) and time to make comparisons and estimates. OH.3-4.M.E Tell time to the nearest minute.
		Represent and interpret data.	OH.K-2.M.D Apply measurement techniques to measure length, weight and volume (capacity). OH.3-4.D.A Gather and organize data from surveys and classroom experiments, including data collected over a period of time. OH.3-4.D.B Read and interpret tables, charts, graphs (bar, picture, line, line plot), and timelines as sources of information, identify main idea, draw conclusions, and make predictions. OH.3-4.D.D Read, interpret and construct graphs in which icons represent more than a single unit or intervals greater than one; e.g., each \diamond (Ohio original uses icon of bicycle) = 10 bicycles or the intervals on an axis are multiples of 10.
		Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	OH.3-4.M.A Select appropriate units for perimeter, area, weight, volume (capacity), time and temperature, using: objects of uniform size; U.S. customary units; e.g., mile, square inch, cubic inch, second, degree Fahrenheit, and other units as app OH.3-4.M.D Identify appropriate tools and apply counting techniques for measuring side lengths, perimeter and area of squares, rectangles, and simple irregular two-dimensional shapes, volume of rectangular prisms, and time and temperature.
		Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	OH.5-7.M.G Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes.
	Geometry	Reason with shapes and their attributes.	OH.3-4.N.C Represent commonly used fractions and mixed numbers using words and physical models. OH.3-4.N.D Use models, points of reference and equivalent forms of commonly used fractions to judge the size of fractions and to compare, describe and order them. OH.3-4.G.A Provide rationale for groupings and comparisons of two-dimensional figures and three-dimensional objects. OH.3-4.G.E Use attributes to describe, classify and sketch plane figures and build solid objects. OH.3-4.G.F Develop definitions of classes of shapes.

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Grade	Domain	Cluster	Benchmark
Grade Four	Operations and Algebraic Thinking	Use the four operations with whole numbers to solve problems.	<p>OH.3-4.N.G Model and use commutative and associative properties for addition and multiplication.</p> <p>OH.3-4.N.J Estimate the results of whole number computations using a variety of strategies, and judge the reasonableness.</p> <p>OH.3-4.N.K Analyze and solve multi-step problems involving addition, subtraction, multiplication and division of whole numbers.</p> <p>OH.3-4.A.C Write and solve open sentences and explain strategies.</p> <p>OH.3-4.A.D Represent an unknown quantity as a variable using a symbol, including letters.</p> <p>OH.3-4.A.E Use variables to create and solve equations representing problem situations.</p> <p>OH.3-4.P.B Use an organized approach and appropriate strategies to solve multi-step problems.</p> <p>OH.3-4.P.C Interpret results in the context of the problem being solved; e.g., the solution must be a whole number of buses when determining the number of buses necessary to transport students.</p> <p>OH.3-4.P.G Use reasoning skills to determine and explain the reasonableness of a solution with respect to the problem situation.</p>
		Gain familiarity with factors and multiples.	<p>OH.3-4.N.E Recognize and classify numbers as prime or composite and list factors.</p> <p>OH.5-7.N.G Apply and explain the use of prime factorizations, common factors, and common multiples in problem situations.</p>
		Generate and analyze patterns.	<p>OH.3-4.A.A Analyze and extend patterns, and describe the rule in words.</p> <p>OH.3-4.A.B Use patterns to make predictions, identify relationships, and solve problems.</p> <p>OH.3-4.A.F Construct and use a table of values to solve problems associated with mathematical relationships.</p> <p>OH.5-7.A.A Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications.</p>
	Number and Operations– Base Ten	Generalize place value understanding for multi-digit whole numbers.	OH.3-4.N.A Use place value structure of the base-ten number system to read, write, represent and compare whole numbers and decimals.
		Use place value understanding and properties of operations to perform multi-digit arithmetic.	<p>OH.K-2.N.M Add and subtract two-digit numbers with and without regrouping.</p> <p>OH.3-4.N.L Use a variety of methods and appropriate tools (mental math, paper and pencil, calculators) for computing with whole numbers.</p> <p>OH.3-4.A.C Write and solve open sentences and explain strategies.</p>
	Number and Operations – Fractions	Extend understanding of fraction equivalence and ordering.	<p>OH.3-4.N.B Recognize and generate equivalent representations for whole numbers, fractions and decimals.</p> <p>OH.3-4.N.D Use models, points of reference and equivalent forms of commonly used fractions to judge the size of fractions and to compare, describe and order them.</p>
		Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	<p>OH.3-4.N.M Add and subtract commonly used fractions with like denominators and decimals, using models and paper and pencil.</p> <p>OH.5-7.N.I Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.</p>
	Number and Operations – Fractions	Understand decimal notation for fractions, and compare decimal fractions.	<p>OH.3-4.N.B Recognize and generate equivalent representations for whole numbers, fractions and decimals.</p> <p>OH.5-7.N.B Compare, order and convert among fractions, decimals and percents.</p> <p>OH.5-7.N.H Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.</p> <p>OH.5-7.N.I Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.</p>

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Grade	Domain	Cluster	Benchmark
Grade Four	Measurement and Data	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	<p>OH.3-4.M.B Know that the number of units is inversely related to the size of the unit for any item being measured.</p> <p>OH.3-4.M.D Identify appropriate tools and apply counting techniques for measuring side lengths, perimeter and area of squares, rectangles, and simple irregular two-dimensional shapes, volume of rectangular prisms, and time and temperature.</p> <p>OH.3-4.M.E Tell time to the nearest minute.</p> <p>OH.5-7.M.B Convert units of length, area, volume, mass and time within the same measurement system.</p> <p>OH.5-7.M.E Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature.</p>
		Represent and interpret data.	OH.3-4.D.C Construct charts, tables and graphs to represent data, including picture graphs, bar graphs, line graphs, line plots and Venn diagrams.
		Geometric measurement: understand concepts of angle and measure angles.	<p>OH.5-7.M.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.</p> <p>OH.5-7.G.A Identify and label angle parts and the regions defined within the plane where the angle resides.</p>
	Geometry	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	<p>OH.3-4.G.B Describe and identify points, lines and planes in the environment.</p> <p>OH.3-4.G.C Describe and identify intersecting, parallel and perpendicular lines or segments in the environment.</p> <p>OH.3-4.G.D Identify and draw right, obtuse, acute and straight angles.</p> <p>OH.3-4.G.E Use attributes to describe, classify and sketch plane figures and build solid objects.</p> <p>OH.3-4.G.F Develop definitions of classes of shapes.</p> <p>OH.3-4.G.H Identify and describe line and rotational symmetry in two-dimensional shapes and designs.</p>

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Grade	Domain	Cluster	Benchmark
Grade Five	Operations and Algebraic Thinking	Write and interpret numerical expressions.	OH.5-7.N.E Use order of operations, including use of parenthesis and exponents to solve multi-step problems, and verify and interpret the results. OH.5-7.A.G Write, simplify and evaluate algebraic expressions.
		Analyze patterns and relationships.	OH.3-4.A.B Use patterns to make predictions, identify relationships, and solve problems. OH.5-7.G.C Specify locations and plot ordered pairs on a coordinate plane. OH.5-7.A.A Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications. OH.5-7.A.E Use rules and variables to describe patterns, functions and other relationships. OH.5-7.A.E Use rules and variables to describe patterns, functions and other relationships.
	Number and Operations–Base Ten	Understand the place value system.	OH.3-4.N.A Use place value structure of the base-ten number system to read, write, represent and compare whole numbers and decimals. OH.5-7.N.A Represent and compare numbers less than 0 through familiar applications and extending the number line. OH.5-7.N.B Compare, order and convert among fractions, decimals and percents. OH.5-7.A.A Describe, extend and determine the rule for patterns and relationships occurring in numeric patterns, computation, geometry, graphs and other applications. OH.5-7.P.F Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures
		Perform operations with multi-digit whole numbers and with decimals to hundredths.	OH.3-4.N.H Use relationships between operations, such as subtraction as the inverse of addition and division as the inverse of multiplication. OH.3-4.N.L Use a variety of methods and appropriate tools (mental math, paper and pencil, calculators) for computing with whole numbers. OH.3-4.N.M Add and subtract commonly used fractions with like denominators and decimals, using models and paper and pencil. OH.5-7.N.F Apply number system properties when performing computations. OH.5-7.N.H Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers. OH.5-7.N.I Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.
	Number and Operations–Fractions	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	OH.5-7.N.H Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers. OH.5-7.N.I Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.
		Use equivalent fractions as a strategy to add and subtract fractions.	OH.5-7.N.H Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers. OH.5-7.N.I Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Grade Five	Measurement and Data	Convert like measurement units within a given measurement system.	OH.5-7.M.B Convert units of length, area, volume, mass and time within the same measurement system.
		Represent and interpret data.	OH.3-4.D.C Construct charts, tables and graphs to represent data, including picture graphs, bar graphs, line graphs, line plots and Venn diagrams.
		Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	OH.3-4.M.D Identify appropriate tools and apply counting techniques for measuring side lengths, perimeter and area of squares, rectangles, and simple irregular two-dimensional shapes, volume of rectangular prisms, and time and temperature. OH.5-7.M.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. OH.5-7.M.E Use problem solving techniques and technology as needed to solve problems involving length, weight, perimeter, area, volume, time and temperature. OH.5-7.M.G Understand and demonstrate the independence of perimeter and area for two-dimensional shapes and of surface area and volume for three-dimensional shapes. OH.5-7.A.J Use formulas in problem-solving situations.
	Geometry	Graph points on the coordinate plane to solve real-world and mathematical problems.	OH.3-4.G.G Find and name locations in coordinate systems. OH.5-7.G.C Specify locations and plot ordered pairs on a coordinate plane.
		Classify two-dimensional figures into categories based on their properties.	OH.3-4.G.E Use attributes to describe, classify and sketch plane figures and build solid objects. OH.3-4.G.F Develop definitions of classes of shapes. OH.5-7.G.D Identify, describe and classify types of line pairs, angles, two-dimensional figures and three-dimensional objects using their properties.

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Grade Six	Ratio and Proportionality Relationships	Understand ratio concepts and use ratio reasoning to solve problems.	OH.5-7.N.D Use models and pictures to relate concepts of ratio, proportion and percent. OH.5-7.M.B Convert units of length, area, volume, mass and time within the same measurement system. OH.5-7.G.B Draw circles, and identify and determine the relationships among the radius, diameter, center and circumference.
	The Number System	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	OH.5-7.N.H Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.
		Compute fluently with multi-digit numbers and find common factors and multiples.	OH.5-7.N.F Apply number system properties when performing computations. OH.5-7.N.H Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.
		Apply and extend previous understandings of numbers to the system of rational numbers.	OH.5-7.N.A Represent and compare numbers less than 0 through familiar applications and extending the number line. OH.5-7.N.B Compare, order and convert among fractions, decimals and percents. OH.5-7.G.C Specify locations and plot ordered pairs on a coordinate plane. OH.5-7.G.H Predict and describe results (size, position, orientation) of transformations of two-dimensional figures
	Expressions and Equations	Apply and extend previous understandings of arithmetic to algebraic expressions.	OH.5-7.N.A Represent and compare numbers less than 0 through familiar applications and extending the number line. OH.5-7.N.B Compare, order and convert among fractions, decimals and percents. OH.5-7.G.C Specify locations and plot ordered pairs on a coordinate plane. OH.5-7.G.H Predict and describe results (size, position, orientation) of transformations of two-dimensional figures
		Reason about and solve one-variable equations and inequalities.	OH.5-7.A.C Use variables to create and solve equations and inequalities representing problem situations. OH.5-7.A.D Use symbolic algebra to represent and explain mathematical relationships. OH.5-7.A.H Solve linear equations and inequalities symbolically, graphically and numerically.
		Represent and analyze quantitative relationships between dependent and independent variables.	OH.5-7.A.B Represent, analyze and generalize a variety of patterns and functions with tables, graphs, words and symbolic rules. OH.5-7.A.F Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships.
	Geometry	Solve real-world and mathematical problems involving area, surface area, and volume.	OH.5-7.M.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. OH.5-7.A.J Use formulas in problem-solving situations.
	Statistics and Probability	Develop understanding of statistical variability.	OH.5-7.D.B Interpret data by looking for patterns and relationships, draw and justify conclusions, and answer related questions.
		Summarize and describe distributions.	OH.5-7.D.A Read, create and use line graphs, histograms, circle graphs, box-and-whisker plots, stem-and-leaf plots, and other representations when appropriate. OH.8-10.D.C Compare the characteristics of the mean, median and mode for a given set of data, and explain which measure of center best represents the data.

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Grade Seven	Ratio and Proportionality Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	<p>OH.5-7.N.I Use a variety of strategies, including proportional reasoning, to estimate, compute, solve and explain solutions to problems involving integers, fractions, decimals and percents.</p> <p>OH.5-7.A.L Analyze functional relationships, and explain how a change in one quantity results in a change in the other.</p> <p>OH.8-10.M.F Write and solve real-world, multi-step problems involving money, elapsed time and temperature, and verify reasonableness of solutions.</p>
	The Number System	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	<p>OH.5-7.N.F Apply number system properties when performing computations.</p> <p>OH.5-7.N.H Use and analyze the steps in standard and non-standard algorithms for computing with fractions, decimals and integers.</p> <p>OH.8-10.N.E Compare, order and determine equivalent forms of real numbers.OH.8-10.M.A Solve increasingly complex non-routine measurement problems and check for reasonableness of results.</p> <p>OH.8-10.M.A Solve increasingly complex non-routine measurement problems and check for reasonableness of results.</p> <p>OH.8-10.M.F Write and solve real-world, multi-step problems involving money, elapsed time and temperature, and verify reasonableness of solutions.</p>
	Expressions and Equations	Use properties of operations to generate equivalent expressions.	OH.5-7.A.D Use symbolic algebra to represent and explain mathematical relationships.
		Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	OH.5-7.A.G Write, simplify and evaluate algebraic expressions.
	Geometry	Draw, construct, and describe geometrical figures and describe the relationships between them.	OH.8-10.N.E Compare, order and determine equivalent forms of real numbers.
		Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	OH.5-7.M.F Analyze and explain what happens to area and perimeter or surface area and volume when the dimensions of an object are changed. OH.5-7.G.I Identify and draw three-dimensional objects from different views (top, side, front and perspective). OH.5-7.G.J Apply properties of equality and proportionality to solve problems involving congruent or similar figures; e.g., create a scale drawing. OH.8-10.G.E Draw and construct representations of two- and three-dimensional geometric objects using a variety of tools, such as straightedge, compass and technology.
		No Aligned Benchmarks	

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Grade Seven	Statistics and Probability	Use random sampling to draw inferences about a population.	<p>OH.5-7.D.G Evaluate conjectures and predictions based upon data presented in tables and graphs, and identify misuses of statistical data and displays.</p> <p>OH.8-10.D.G Describe sampling methods and analyze the effects of method chosen on how well the resulting sample represents the population.</p>
		Draw informal comparative inferences about two populations.	<p>OH.3-4.D.E Describe data using mode, median and range.</p> <p>OH.5-7.D.F Determine and use the range, mean, median and mode to analyze and compare data, and explain what each indicates about the data.</p> <p>OH.5-7.D.G Evaluate conjectures and predictions based upon data presented in tables and graphs, and identify misuses of statistical data and displays.</p> <p>OH.8-10.D.A Create, interpret and use graphical displays and statistical measures to describe data; e.g., box-and-whisker plots, histograms, scatterplots, measures of center and variability.</p> <p>OH.8-10.D.C Compare the characteristics of the mean, median and mode for a given set of data, and explain which measure of center best represents the data.</p> <p>OH.11-12.D.B Use descriptive statistics to analyze and summarize data, including measures of center, dispersion, correlation and variability.</p>
		Investigate chance processes and develop, use, and evaluate probability models	<p>OH.3-4.D.F Conduct a simple probability experiment and draw conclusions about the likelihood of possible outcomes.</p> <p>OH.3-4.D.G Identify and represent possible outcomes, such as arrangements of a set of up to four members and possible combinations from several sets, each containing 2 or 3 members.</p> <p>OH.3-4.D.H Use the set of possible outcomes to describe and predict events.</p> <p>OH.5-7.D.C Evaluate interpretations and conclusions as additional data are collected, modify conclusions and predictions, and justify new findings.</p> <p>OH.5-7.D.D Compare increasingly complex displays of data, such as multiple sets of data on the same graph.</p> <p>OH.5-7.D.E Collect, organize, display and interpret data for a specific purpose or need.</p> <p>OH.5-7.D.H Find all possible outcomes of simple experiments or problem situations, using methods such as lists, arrays and tree diagrams.</p> <p>OH.5-7.D.J Compare experimental and theoretical results for a variety of simple experiments.</p> <p>OH.5-7.D.K Make and justify predictions based on experimental and theoretical probabilities.</p> <p>OH.8-10.D.J Compute probabilities of compound events, independent events, and simple dependent events.</p>

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Common Core State Standards K – 8			Ohio – 2001 Academic Content Standards
Grade	Domain	Cluster	Benchmark
Grade Eight	Number System	Know that there are numbers that are not rational, and approximate them by rational numbers.	OH.8-10.N.D Connect physical, verbal and symbolic representations of integers, rational numbers and irrational numbers. OH.8-10.N.E Compare, order and determine equivalent forms of real numbers.
	Expressions and Equations	Work with radicals and integer exponents.	OH.8-10.N.A Use scientific notation to express large numbers and numbers less than one. OH.8-10.N.H Find the square root of perfect squares, and approximate the square root of non-perfect squares. OH.8-10.N.I Estimate, compute and solve problems involving scientific notation, square roots and numbers with integer exponents.
		Understand the connections between proportional relationships, lines, and linear equations.	OH.5-7.M.A Select appropriate units to measure angles, circumference, surface area, mass and volume, using: U.S. customary units; e.g., degrees, square feet, pounds, and other units as appropriate; metric units; e.g., square meters, kilograms and OH.5-7.A.M Approximate and interpret rates of change from graphical and numerical data.
		Analyze and solve linear equations and pairs of simultaneous linear equations.	OH.8-10.A.F Solve and graph linear equations and inequalities. OH.8-10.A.H Solve systems of linear equations involving two variables graphically and symbolically.
	Functions	Define, evaluate, and compare functions.	OH.8-10.A.B Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations. OH.8-10.A.C Translate information from one representation (words, table, graph or equation) to another representation of a relation or function.
		Use functions to model relationships between quantities.	OH.5-7.A.F Use representations, such as tables, graphs and equations, to model situations and to solve problems, especially those that involve linear relationships. OH.8-10.A.B Identify and classify functions as linear or nonlinear, and contrast their properties using tables, graphs or equations. OH.8-10.A.D Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations.
	Number System	Understand congruence and similarity using physical models, transparencies, or geometry software.	OH.3-4.G.J Describe a motion or series of transformations that show two shapes are congruent. OH.8-10.G.B Describe and apply the properties of similar and congruent figures; and justify conjectures involving similarity and congruence. OH.8-10.G.C Recognize and apply angle relationships in situations involving intersecting lines, perpendicular lines and parallel lines. OH.8-10.G.F Represent and model transformations in a coordinate plane and describe the results.
		Understand and apply the Pythagorean Theorem.	OH.8-10.G.H Establish the validity of conjectures about geometric objects, their properties and relationships by counter-example, inductive and deductive reasoning, and critiquing arguments made by others.
		Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.	OH.8-10.M.B Use formulas to find surface area and volume for specified three-dimensional objects accurate to a specified level of precision.
	Statistics and Probability	Investigate patterns of association in bivariate data.	OH.8-10.D.A Create, interpret and use graphical displays and statistical measures to describe data; e.g., box-and-whisker plots, histograms, scatterplots, measures of center and variability.

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Standards for Mathematical Practice	Ohio – 2001 Academic Content Standards
Practice	Benchmark
<p>Reason abstractly and quantitatively.</p>	<p>OH.3-4.P.G Use an organized approach and appropriate strategies to solve multi-step problems.</p> <p>OH.3-4.P.J Read, interpret, discuss and write about mathematical ideas and concepts using both everyday and mathematical language</p> <p>OH.5-7.P.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.</p> <p>OH.5-7.P.B Apply and adapt problem-solving strategies to solve a variety of problems, including unfamiliar and non-routine situations.</p> <p>OH.5-7.P.C Recognize whether an estimate or an exact solution is appropriate for a given problem situation.</p> <p>OH.5-7.P.F Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures.</p> <p>OH.5-7.P.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.</p> <p>OH.8-10.P.C Recognize and use connections between equivalent representations and related procedures for a mathematical concept; e.g., zero of a function and the x-intercept of the graph of the function, apply proportional thinking when measuring, describing functions, and comparing probabilities.</p> <p>OH.8-10.P.E Use a variety of mathematical representations flexibly and appropriately to organize, record and communicate mathematical ideas.</p> <p>OH.11-12.P.C Assess the adequacy and reliability of information available to solve a problem.</p>
<p>Construct viable arguments and critique the reasoning of others.</p>	<p>OH.3-4.P.H Recognize basic valid and invalid arguments, and use examples, models, number relationships, and logic to support or refute.</p> <p>OH.3-4.P.J Read, interpret, discuss and write about mathematical ideas and concepts using both everyday and mathematical language.</p> <p>OH.3-4.P.K Use mathematical language to explain and justify mathematical ideas, strategies and solutions.</p> <p>OH.5-7.P.E Use deductive thinking to construct informal arguments to support reasoning and to justify solutions to problems.</p> <p>OH.5-7.P.F Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures.</p> <p>OH.5-7.P.G Relate mathematical ideas to one another and to other content areas; e.g., use area models for adding fractions, interpret graphs in reading and science and social studies.</p> <p>OH.8-10.P.F Use precise mathematical language and notations to represent problem situations and mathematical ideas.</p> <p>OH.8-10.P.G Write clearly and coherently about mathematical thinking and ideas.</p> <p>OH.8-10.P.H Locate and interpret mathematical information accurately, and communicate ideas, processes and solutions in a complete and easily understood manner.</p> <p>OH.8-10.P.D Apply reasoning processes and skills to construct logical verifications of counter-examples to test conjectures and to justify and defend algorithms and solutions.</p> <p>OH.11-12.P.D Select and use various types of reasoning and methods of proof.</p> <p>OH.11-12.P.E Use a variety of mathematical representations flexibly and appropriately to organize, record and communicate mathematical ideas.</p> <p>OH.11-12.P.F Use precise mathematical language and notations to represent problem situations and mathematical ideas.</p>

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Standards for Mathematical Practice	Ohio – 2001 Academic Content Standards
Practice	Benchmark
<p>Model with mathematics.</p>	<p>OH.K-2.P.A Use a variety of strategies to understand problem situations; e.g., discussing with peers, stating problems in own words modeling problems with diagrams or physical materials, identifying a pattern.</p> <p>OH.K-2.P.C Generate alternative strategies to solve problems.</p> <p>OH.K-2.P.F Draw pictures and use physical models to represent problem situations and solutions.</p> <p>OH.K-2.P.G Use invented and conventional symbols and common language to describe a problem situation and solution.</p> <p>OH.3-4.P.A Apply and justify the use of a variety of problem solving strategies; e.g., make an organized list, guess and check.</p> <p>OH.3-4.P.B Use an organized approach and appropriate strategies to solve multi-step problems.</p> <p>OH.3-4.P.D Use mathematical strategies to solve problems that relate to other curriculum areas and the real world; e.g., use a timeline to sequence events; use symmetry in artwork.</p> <p>OH.3-4.P.F Recognize relationships among different topics within mathematics; e.g., the length of an object can be represented by a number.</p> <p>OH.3-4.P.I Represent problem situations in a variety of forms (physical model, diagram, in words or symbols), and recognize when some ways of representing a problem may be more helpful than others.</p> <p>OH.5-7.P.B Apply and adapt problem-solving strategies to solve a variety of problems, including unfamiliar and non-routine situations.</p> <p>OH.5-7.P.C Recognize whether an estimate or an exact solution is appropriate for a given problem situation.</p> <p>OH.5-7.P.H Use representations to organize and communicate mathematical thinking and problem solutions.</p> <p>OH.5-7.P.K Recognize and use mathematical language and symbols when reading, writing and conversing with others.</p> <p>OH.11-12.P.J Apply mathematical modeling to workplace and consumer situations, including problem formulations, identification of a mathematical model, interpretation of solution within the model, and validation to original problem situation.</p>
<p>Use appropriate tools strategically.</p>	<p>OH.K-2.P.B Identify and restate in own words the question or problem and the information needed to solve the problem.</p> <p>OH.K-2.P.D Evaluate the reasonableness of predictions, estimations and solutions.</p> <p>OH.3-4.P.A Apply and justify the use of a variety of problem solving strategies; e.g., make an organized list, guess and check.</p>

Mathematics Academic Content Standards Crosswalk

Comparison of the Common Core State Standards and the 2001 Academic Content Standards for Mathematics

Standards for Mathematical Practice	Ohio – 2001 Academic Content Standards
Practice	Benchmark
<p>Attend to precision.</p>	<p>OH.K-2.P.G Use invented and conventional symbols and common language to describe a problem situation and solution.</p> <p>OH.K-2.P.H Recognize the mathematical meaning of common words and phrases, and relate everyday language to mathematical language and symbols</p> <p>OH.K-2.P.I Communicate mathematical thinking by using everyday language and appropriate mathematical language.</p> <p>OH.3-4.P.C Interpret results in the context of the problem being solved; e.g., the solution must be a whole number of buses when determining the number of buses necessary to transport students.</p> <p>OH.3-4.P.J Read, interpret, discuss and write about mathematical ideas and concepts using both everyday and mathematical language.</p> <p>OH.5-7.P.D Recognize whether an estimate or an exact solution is appropriate for a given problem situation.</p> <p>OH.5-7.P.H Use representations to organize and communicate mathematical thinking and problem solutions.</p> <p>OH.5-7.P.J Communicate mathematical thinking to others and analyze the mathematical thinking and strategies of others.</p> <p>OH.5-7.P.K Recognize and use mathematical language and symbols when reading, writing and conversing with others.</p> <p>OH.8-10.P.F Use precise mathematical language and notations to represent problem situations and mathematical ideas.</p> <p>OH.8-10.P.G Write clearly and coherently about mathematical thinking and ideas.</p> <p>OH.11-12.P.F Use precise mathematical language and notations to represent problem situations and mathematical ideas</p> <p>OH.11-12.P.H Use formal mathematical language and notation to represent ideas, to demonstrate representations systems, and to formulate generalizations.</p> <p>OH.11-12.P.I Communicate mathematical ideas orally and in writing with a clear purpose and appropriate for a specific audience.</p>
<p>Look for and make use of structure.</p>	<p>OH.3-4.P.E Link concepts to procedures and to symbolic notation; e.g., model 3×4 with a geometric array, represent one-third by dividing an object into three equal parts.</p> <p>OH.5-7.P.F Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures.</p> <p>OH.5-7.P.G Relate mathematical ideas to one another and to other content areas; e.g., use area models for adding fractions, interpret graphs in reading and science and social studies.</p> <p>OH.11-12.P.G Understand the difference between a statement that is verified by mathematical proof, such as a theorem, and one that is verified empirically using examples or data.</p>
<p>Look for and express regularity in repeated reasoning.</p>	<p>OH.5-7.P.F Use inductive thinking to generalize a pattern of observations for particular cases, make conjectures, and provide supporting arguments for conjectures.</p> <p>OH.5-7.P.G Relate mathematical ideas to one another and to other content areas; e.g., use area models for adding fractions, interpret graphs in reading and science and social studies.</p> <p>OH.11-12.P.A Construct algorithms for multi-step and non-routine problems.</p> <p>OH.11-12.P.B Construct logical verifications or counter-examples to test conjectures and to justify or refute algorithms and solutions to problems.</p>