

Arizona Academic Standards, Grade 4  
correlated to  
Academic Language Notebooks, The Language of Math  
Level D

<b><i>Strand 1: Number and Operations</i></b>	
<b>Concept 1: Number Sense</b>	
Understand and apply numbers, ways of representing numbers, and the relationships among numbers and different number systems.	
PO 1. Express whole numbers, fractions, decimals, and percents using and connecting multiple representations.	Module 2: Compare and Order Whole Numbers Module 26: Read and Write Fractions Module 30: Decimal Concepts
PO 2. Compose and decompose whole numbers using factors and multiples.	Module 2: Compare and Order Whole Numbers Module 3: Round Whole Numbers
PO 3. Express fractions as fair sharing, parts of a whole, parts of a set, and locations on a real number line.	Module 27: Compare and Order Equivalent Fractions
PO 4. Compare and order decimals to hundredths.	Module 30: Decimal Concepts
PO 5. Use simple ratios to describe problems in context.	
<b>Concept 2: Numerical Operations</b>	
Understand and apply numerical operations and their relationship to one another.	
PO 2. Use multiple strategies to multiply whole numbers <ul style="list-style-type: none"> <li>• two-digit by two-digit and</li> <li>• multi-digit by one-digit.</li> </ul>	Module 7: Multiplication and Division Concepts Module 8: Multiplication Properties and Division Rules Module 9: Multiplication and Division Facts Module 10: Model Multiplication by 1- and 2-Digital Numbers
PO 3. Demonstrate fluency of multiplication and division facts through 12.	Module 9: Multiplication and Division Facts
PO 4. Use multiple strategies to divide whole numbers.	Module 7: Multiplication and Division Concepts Module 8: Multiplication Properties and Division Rules Module 9: Multiplication and Division Facts Module 11: Model Division by 1- and 2-Digit Numbers
PO 5. Apply associative and distributive properties to solve multiplication and division problems.	
PO 6. Apply order of operations with whole numbers.	
<b>Concept 3: Estimation</b>	
Use estimation strategies reasonably and fluently while integrating content from each of the other strands.	
PO 1. Use benchmarks as meaningful points of comparison for whole numbers, decimals, and fractions.	Module 5: Mental Math Module 6: Estimation
PO 2. Make estimates appropriate to a given situation or computation with whole numbers and fractions.	Module 6: Estimation

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<b>Strand 2: Data Analysis, Probability, and Discrete Mathematics</b>	
<b>Concept 1: Data Analysis (Statistics)</b> Understand and apply data collection, organization, and representation to analyze and sort data.	
PO 1. Collect, record, organize, and display data using double bar graphs, single line graphs, or circle graphs.	Module 19: Collect and Organize Data Module 20: Read and Make Graphs
PO 2. Formulate and answer questions by interpreting and analyzing displays of data, including double bar graphs, single line graphs, or circle graphs.	Module 19: Collect and Organize Data Module 20: Read and Make Graphs
PO 3. Use median, mode, and range to describe the distribution of a given data set.	
PO 4. Compare two sets of related data.	Module 20: Read and Make Graphs
<b>Concept 2: Probability</b> Understand and apply the basic concepts of probability.	
PO 1. Describe elements of theoretical probability by listing or drawing all possible outcomes of a given event and predicting the outcome using word and number benchmarks.	
<b>Concept 3: Systematic Listing and Counting</b> Understand and demonstrate the systematic listing and counting of possible outcomes.	
PO 1. Construct tree diagrams to solve problems in context by <ul style="list-style-type: none"> <li>• representing all possibilities for a variety of counting problems,</li> <li>• explaining how its properties relate to the problem,</li> <li>• representing the same counting problem in multiple ways, and</li> <li>• drawing conclusions.</li> </ul>	
PO 2. Justify that all possibilities have been enumerated without duplication.	

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<b>Concept 4: Vertex-Edge Graphs</b> Understand and apply vertex-edge graphs.	
PO 1. Demonstrate the connection between map coloring and vertex coloring.	
PO 2. Construct vertex-edge graphs to represent concrete situations and identify paths and circuits.	
PO 3. Solve conflict problems by constructing and coloring vertex-edge graphs.	
<b><i>Strand 3: Patterns, Algebra, and Functions</i></b>	
<b>Concept 1: Patterns</b> Identify patterns and apply pattern recognition to reason mathematically while integrating content from each of the other strands.	
PO 1. Recognize, describe, create, extend, and find missing terms in a numerical sequence involving whole numbers using all four basic operations.	Module 13: Algebraic Expressions Module 14: Algebraic Equations Module 15: Patterns and Functions
PO 2. Explain the rule for a given numerical sequence, verify that the rule works, and use the rule to make predictions.	
<b>Concept 3: Algebraic Representations</b> Represent and analyze mathematical situations and structures using algebraic representations.	
PO 1. Use a symbol to represent an unknown quantity in a simple algebraic expression involving all operations.	Module 13: Algebraic Expressions
PO 2. Create and solve one-step equations that can be solved using addition, subtraction, multiplication, and division of whole numbers.	Module 14: Algebraic Equations
<b>Concept 4: Analysis of Change</b> Analyze how changing the values of one quantity corresponds to change in the values of another quantity.	
PO 1. Identify the change in a quantity over time and make simple predictions.	
<b><i>Strand 4: Geometry and Measurement</i></b>	
<b>Concept 1: Geometric Properties</b> Analyze the attributes and properties of 2- and 3- dimensional figures and develop mathematical arguments about their relationships.	
PO 1. Draw and describe the relationships between points, lines, line segments, rays, and angles including parallelism and perpendicularity.	Module 21: Points, Lines, Line Segments, Rays, and Angles
PO 2. Justify which objects in a collection match a given geometric description.	Unit 8: Geometry
PO 3. Describe and classify triangles by angles and sides.	Module 22: Polygons and Circles
PO 4. Recognize which attributes (such as shape or	Module 23: Transformations and Symmetry

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area) change and which do not change when 2-dimensional figures are cut up or rearranged.	
PO 5. Recognize and draw congruent figures, and match them in a given collection.	
PO 6. Draw right, acute, obtuse, and straight angles and identify these angles in other geometric figures.	
PO 7. Recognize the relationship between a 3-dimensional figure and its corresponding net(s).	
<b>Concept 3: Coordinate Geometry</b> Specify and describe spatial relationships using rectangular and other coordinate systems while integrating content from each of the other strands.	
PO 1. Name, locate, and graph points in the first quadrant of the coordinate plane using ordered pairs.	
PO 2. Plot line segments in the first quadrant of the coordinate plane using a set of ordered pairs in a table.	
PO 3. Construct geometric figures with vertices at points on the coordinate plane.	
<b>Concept 4: Measurement</b> Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.	
PO 1. Compute elapsed time to the minute.	Module 16: Time
PO 2. Apply measurement skills to measure length, mass, and capacity using metric units.	Module 17: Measures of Length (Customary and Metric) Module 18: Measures of Capacity and Weight/Mass (Customary and Metric)
PO 3. Solve problems involving conversions within the same measurement system.	Module 17: Measures of Length (Customary and Metric) Module 18: Measures of Capacity and Weight/Mass (Customary and Metric)
PO 4. Solve problems involving perimeter of 2-dimensional figures and area of rectangles.	
PO 5. Describe the change in perimeter or area when one attribute (length or width) of a rectangle changes.	
<b>Strand 5: Structure and Logic</b>	
<b>Concept 1: Algorithms and Algorithmic Thinking</b> Use reasoning to solve mathematical problems.	

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PO 1. Analyze common algorithms for computing (adding, subtracting, multiplying, and dividing) with whole numbers using the associative, commutative, and distributive properties.	
<b>Concept 2: Logic, Reasoning, Problem Solving, and Proof</b> Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.	
PO 1. Analyze a problem situation to determine the question(s) to be answered.	
PO 2. Identify relevant, missing, and extraneous information related to the solution to a problem.	
PO 3. Select and use one or more strategies to efficiently solve the problem and justify the selection.	
PO 4. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem.	
PO 5. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	
PO 6. Summarize mathematical information, explain reasoning, and draw conclusions.	
PO 7. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	
PO 8. Make and test conjectures based on data (or information) collected from explorations and experiments.	