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correlated to

Arizona Mathematics Standards

Articulated by Grade Level

GRADES K-8



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# Summer Success: Math © 2008

correlated to

## Arizona Mathematics Standard Articulated by Grade Level

### Kindergarten

### Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade Kindergarten Performance Objectives	Summer Success: Math, Kindergarten
PO 1. Make a model to represent a given whole number 0 through 20.	<b>Teacher's Edition:</b> 6d, 7-8, 12a, 13, 14a, 15-16, 19-20, 20a, 21-22, 27-28, 28c, 29, 34a, 41-42, 42a, 49-50, 50c, 51, 58a, 64a, 65, 66a, 72c, 78a, 88a, 89-90, 94c, 95, 101, 102a, 105-106, 116c, 122a, 125, 131
PO 2. Identify orally a whole number represented by a model with a word name and symbol 0 through 20. (Say 3 and write number 3 when presented with three objects.)	<b>Teacher's Edition:</b> 6d, 7, 12a, 13, 14a, 15-16, 20a, 25-26, 27-28, 28c, 65, 66a, 72c
PO 4. Identify whole numbers through 20 in or out of order.	<b>Teacher's Edition:</b> 6d, 7-8, 9-10, 12a, 13, 14a, 15-16, 19-20, 20a, 21-22, 29, 58a, 66a, 69-70, 71-72, 89-90
PO 5. Write whole numbers through 20 in or out of order.	<b>Teacher's Edition:</b> 6d, 12a, 13, 14a, 16, 20a, 21-22, 66a
PO 7. Compare two whole numbers through 20.	<b>Teacher's Edition:</b> 19-20, 60, 61-62, 80a, 89, 100a, 101, 116c, 132a
PO 8. Recognize the ordinal numbers through fifth (e.g., first, second, third).	<b>Teacher's Edition:</b> 42a, 43, 44a, 60
PO 9. Order three or more whole numbers through 20 (least to greatest or greatest to least).	<b>Teacher's Edition:</b> 16, 22, 22a, 36a, 37, 44a, 52, 56a, 63-64, 80a, 81, 88, 95, 119-120, 123, 124a, 126, 130a, 133

<b>Grade Kindergarten Performance Objectives</b>	<b>Summer Success: Math, Kindergarten</b>
PO 10. Identify penny, nickel, dime, quarter, and dollar by using manipulatives or pictures.	<b>Teacher's Edition:</b> 6e, 22b, 24, 28d, 29, 39-40, 56b, 58, 66b, 78d, 108b, 110, 124b, 125

## **Concept 2: Numerical Operations**

**Understand and apply numerical operations and their relationship to one another.**

<b>Grade Kindergarten Performance Objectives</b>	<b>Summer Success: Math, Kindergarten</b>
PO 1. Model addition through sums of 10 using manipulatives.	<b>Teacher's Edition:</b> 6d, 9-10, 12a, 14a, 15, 17-18, 20a, 21, 22a-b, 23-24, 28c, 31-32, 34a, 35, 36a, 37, 39-40, 41-42, 44b, 50c, 57-58, 58a-b, 59, 60a-b, 67, 72c, 73-74, 75-76, 78a, 79-80, 82, 85-86, 86a, 87, 88a, 90, 97-98, 100a, 108a, 109, 110a, 111, 112, 116c, 117-118, 122a, 123-124, 124a, 125, 126, 130a, 131-132, 133, 134
PO 2. Model subtraction with minuends of 10 using manipulatives.	<b>Teacher's Edition:</b> 9-10, 42a, 43-44, 56b, 64a, 65, 66a, 67, 88a, 94c, 95, 102a, 103-104, 111, 125, 132a
PO 5. Identify the symbols: +, -, =.	<b>Teacher's Edition:</b> 12a, 14a, 22a
PO 6. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6d-e, 12b, 14b, 20b, 22b, 28d, 34b, 36b, 42b, 44b, 50d, 56b, 58b, 64b, 66b, 72d, 78d, 80a-b, 86b, 94d, 100b, 102b, 108b, 110b, 116d, 122b, 124b, 130b, 132b

## **Concept 3: Estimation**

**Use estimation strategies reasonably and fluently.**

<b>Grade Kindergarten Performance Objectives</b>	<b>Summer Success: Math, Kindergarten</b>
PO 1. Solve problems using a variety of mental computations and reasonable estimations.	<b>Teacher's Edition:</b> 86a, 100a, 110

## Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade Kindergarten Performance Objectives	Summer Success: Math, Kindergarten
PO 1. Formulate questions to collect data in contextual situations.	Teacher's Edition: 33-34, 55-56, 77-78, 99-100, 121-122
PO 2. Interpret a pictograph.	Teacher's Edition: 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 3. Answer questions about a pictograph.	Teacher's Edition: 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 4. Formulate questions based on data displayed in graphs, charts, and tables.	Teacher's Edition: 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 5. Solve problems based on simple graphs, charts, and tables.	Teacher's Edition: 11-12, 33-34, 55-56, 77-78, 99-100, 121-122

### Concept 3: Discrete Mathematics – Systematic Listing and Counting

Understand and demonstrate the systematic listing and counting of possible outcomes.

Grade Kindergarten Performance Objectives	Summer Success: Math, Kindergarten
PO 1. Make arrangements that represent the number of combinations that can be formed by pairing items taken from 2 sets, using manipulatives (e.g., How many outfits can one make with 2 different color shirts and 2 different pairs of pants?).	Teacher's Edition: 88

## Strand 3: Patterns, Algebra and Functions

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically.

Grade Kindergarten Performance Objectives	Summer Success: Math, Kindergarten
PO 1. Communicate orally a grade-level appropriate pattern.	<b>Teacher's Edition:</b> 12a, 14a, 21, 22a
PO 2. Extend simple repetitive patterns using manipulatives.	<b>Teacher's Edition:</b> 19-20, 34a, 37, 59, 83-84, 102, 108a, 112, 116, 116d, 117, 122a, 124a, 132a, 133
PO 3. Create grade-level appropriate patterns.	<b>Teacher's Edition:</b> 6d, 12a, 14a, 20a, 22a, 34a, 36a-b, 37, 42a, 44a-b, 46, 50c, 58a, 59, 66a, 80a, 83-84, 88a, 100a, 107-108, 110a, 124a, 130a

## Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade Kindergarten Performance Objectives	Summer Success: Math, Kindergarten
PO 1. Identify 2-dimensional shapes by attribute (size, shape, number of sides).	<b>Teacher's Edition:</b> 6e, 14b, 15, 20b, 28d, 35, 36b, 42b, 44b, 50d, 51, 64b, 65, 72d, 74, 78d, 80a-b, 86b, 88b, 102, 116d, 122b, 123, 130b, 132b
PO 2. Identify concepts and terms of position and size in contextual situations: <ul style="list-style-type: none"> <li>• Inside/outside,</li> <li>• Above/below/between,</li> <li>• Smaller/larger, and</li> <li>• Longer/shorter.</li> </ul>	<b>Teacher's Edition:</b> 20b, 43, 44b, 45, 50d, 65, 68, 72d, 80b, 82, 88b, 96, 100b, 102b, 104, 110b, 116d, 118, 122b, 124b, 130b, 132, 132b
PO 3. Identify shapes in different environments (e.g., nature, buildings, classroom).	<b>Teacher's Edition:</b> 6e, 20b, 35, 36b, 78d, 86b, 102b, 108b, 110, 110b, 127-128

## Concept 4: Measurement-Units of Measure -Geometric Objects

Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.

Grade Kindergarten Performance Objectives	Summer Success: Math, Kindergarten
PO 1. Verbally compare objects according to observable and measurable attributes.	<b>Teacher's Edition:</b> 12b, 13, 20b, 34b, 122b
PO 2. Communicate orally how different attributes of an object can be measured.	<b>Teacher's Edition:</b> 12b, 34b, 130b
PO 3. Order objects according to observable and measurable attributes.	<b>Teacher's Edition:</b> 12b, 20b, 34b

## Strand 5: Structure and Logic

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. **Communication, Problem-solving, Reasoning & Proof, Connections, and Representation** are the process standards that are embedded throughout the teaching and learning of mathematical strands.

## Concept 2: Logic, Reasoning, Arguments, And Mathematical Proof

Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions and recognize their applications.

Grade Kindergarten Performance Objectives	Summer Success: Math, Kindergarten
PO 1. Sort objects according to observable attributes.	<b>Teacher's Edition:</b> 53-54, 56a, 57, 64a, 66a, 74, 78a, 79, 94c, 129-130, 137-138
PO 2. Provide rationale for classifying objects according to observable attributes (color, size, shape, weight, etc.).	<b>Teacher's Edition:</b> 6d, 23, 28d, 47-48, 53-54, 56a, 57, 64a, 78a, 79



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## Arizona Mathematics Standard Articulated by Grade Level

### Grade 1

### Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade 1 Performance Objectives	Summer Success: Math, Grade 1
PO 1. Make a model to represent a given whole number 0 through 100.	<b>Teacher's Edition:</b> 8, 13, 14a, 15, 17-18, 20a, 21, 22a, 28c, 44a, 50c, 56a, 57, 58a, 64a, 80a, 81, 86a, 88a, 89, 100a, 103, 116c, 118, 124a
PO 2. Identify a whole number represented by a model with a word name and symbol 0 through 100.	<b>Teacher's Edition:</b> 9-10, 12a, 13, 44a, 64a, 80a, 81, 86a, 88a, 89, 100a, 103, 116c, 118, 124a
PO 3. Count aloud, forward or backward, in consecutive order (0 through 100).	<b>Teacher's Edition:</b> 72c
PO 4. Identify whole numbers through 100 in or out of order.	<b>Teacher's Edition:</b> 6d, 7, 9-10, 12a, 15, 28c, 35-36, 45, 50c, 64a, 72c, 100a, 116c, 132a
PO 5. Write whole numbers through 100 in or out of order.	<b>Teacher's Edition:</b> 6d, 7, 12a, 35-36, 45, 50c, 72c, 100a, 132a
PO 6. Construct equivalent forms of whole numbers, using manipulatives or symbols, through 99 (e.g., $15 + 5 = 10 + 10$ ).	<b>Teacher's Edition:</b> 50c, 89, 94, 100a, 133
PO 7. State verbally whole numbers, through 100, using correct place value (e.g., A student will read 84 as eight tens and four ones.).	<b>Teacher's Edition:</b> 57, 58a, 59, 66a, 94c, 96, 102a, 110a, 111, 116c, 122a, 132a, 133

<b>Grade 1 Performance Objectives</b>	<b>Summer Success: Math, Grade 1</b>
PO 8. Construct models to represent place value concepts for the one's and ten's places.	<b>Teacher's Edition:</b> 57, 58a, 59, 66a, 88a, 94c, 96, 102a, 110a, 116c, 122a, 132a, 133
PO 9. Apply expanded notation to model place value through 99 (e.g., $37 = 3$ groups of ten + 7 units).	<b>Teacher's Edition:</b> 58a, 59, 66a, 94c, 96, 102a, 110a, 111, 122a, 132a
PO 10. Identify odd and even whole numbers through 100.	<b>Teacher's Edition:</b> 31-32, 34a, 45, 50c, 52, 78a, 107-108, 116
PO 11. Compare two whole numbers through 100.	<b>Teacher's Edition:</b> 34a, 35, 42a, 43, 50c, 72c, 74, 117, 132a
PO 12. Use ordinal numbers through tenth.	<b>Teacher's Edition:</b> 12a, 21, 23, 66a, 67
PO 13. Order three or more whole numbers through 100 (least to greatest or greatest to least).	<b>Teacher's Edition:</b> 14a, 24, 36a, 39-40, 44a, 63-64, 65, 67, 80a, 82, 87, 88a, 97-98, 100a, 110a, 112
PO 14. Make models that represent given fractions (halves).	<b>Teacher's Edition:</b> 72c, 86a, 130a
PO 15. Identify in symbols and in words a model that is divided into equal fractional parts (halves).	<b>Teacher's Edition:</b> 86a, 88, 130a
PO 16. Identify money by name and value: penny, nickel, dime, quarter, and one dollar.	<b>Teacher's Edition:</b> 6e, 7, 22b, 28d, 29, 42b, 44b, 56b, 58, 60, 66, 66b, 68, 80b, 81, 88b, 89, 102, 119-120, 122b
PO 17. Count money through \$1.00 using coins.	<b>Teacher's Edition:</b> 6e, 22b, 28d, 29, 42b, 44b, 56b, 60, 66, 66b, 68, 80b, 81, 88b, 89, 102, 119-120, 122b
PO 18. Identify the value of a collection of coins using the symbols ¢ and \$.	<b>Teacher's Edition:</b> 6e, 7, 22b, 28d, 29, 42b, 44b, 56b, 58, 60, 66, 66b, 68, 80b, 81, 88b, 89, 102, 119-120, 122b

## **Concept 2: Numerical Operations**

**Understand and apply numerical operations and their relationship to one another.**

<b>Grade 1 Performance Objectives</b>	<b>Summer Success: Math, Grade 1</b>
PO 1. Demonstrate the process of addition through sums of 20 using manipulatives.	<b>Teacher's Edition:</b> 9-10, 12a, 16, 20a, 21, 23, 29-30, 34a, 37-38, 41-42, 43, 53-54, 59, 61-62, 63-64, 64a, 65, 68, 71-72, 73, 75-76, 78a, 79, 81, 83-84, 87, 89-90, 94c, 95-96, 100a, 102a, 108a, 123-124, 132, 132a
PO 2. Demonstrate the process of subtraction with minuends of 20 using manipulatives.	<b>Teacher's Edition:</b> 9-10, 14a, 34a, 51, 56a, 58a, 59, 75-76, 83-84, 86a, 94c, 100a, 101, 122a, 123-124, 124a

<b>Grade 1 Performance Objectives</b>	<b>Summer Success: Math, Grade 1</b>
PO 3. State addition facts for sums through 18 and subtraction for differences with minuends through 9 or less.	<b>Teacher's Edition:</b> 6d, 13-14, 15-16, 22a, 28c-d, 36a, 42a, 57, 94c, 95, 103, 107-108, 109, 123-124, 125-126, 131-132, 132a
PO 4. Add one- and two-digit whole numbers without regrouping.	<b>Teacher's Edition:</b> 21-22, 23, 35-36, 36a, 37, 68, 73, 78a, 79, 80, 81, 82, 87-88, 110a, 111, 116c, 117, 123-124, 125-126, 131-132, 132a
PO 5. Subtract one- and two-digit whole numbers without regrouping.	<b>Teacher's Edition:</b> 36a, 37, 57, 58a, 68, 86a, 122a, 123-124, 124a
PO 6. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 22, 22a, 24, 30, 36, 44, 46, 52, 60, 66, 73, 80, 88, 90, 96, 102, 104, 112, 118, 126
PO 8. Count by multiples to show the process of multiplication (10s, 5s, or 2s).	<b>Teacher's Edition:</b> 20a, 38, 44, 59, 80, 80a, 81, 82, 88, 90, 108a, 109, 111, 130a
PO 9. Demonstrate families of equations for addition and subtraction through 18.	<b>Teacher's Edition:</b> 78a, 79, 85-86, 86a, 93, 94c, 96, 100a, 102a, 108a, 116c
PO 12. Apply the symbols: +, -, =.	<b>Teacher's Edition:</b> 7, 8, 23, 34a, 37, 79, 82, 87, 89, 94c, 104, 109-110, 122a, 124a, 132a, 133
PO 13. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6e, 12b, 20b, 28d, 34b, 36b, 42b, 44b, 50d, 56b, 58b, 64b, 66a-b, 72d, 78b, 80b, 86b, 88b, 94d, 100b, 102b, 108b, 110b, 116d, 122b, 124b, 132b
PO 14. Demonstrate addition of fractions with like denominators (halves) using models.	<b>Teacher's Edition:</b> 105-106, 108a
PO 16. Add and subtract money without regrouping using manipulatives and paper and pencil, through 99¢.	<b>Teacher's Edition:</b> 22b, 28d, 29, 42b, 44b, 56b, 58, 60, 66, 66b, 68, 80b, 81, 88b, 89, 102, 119-120

### **Concept 3: Estimation**

**Use estimation strategies reasonably and fluently.**

<b>Grade 1 Performance Objectives</b>	<b>Summer Success: Math, Grade 1</b>
PO 1. Solve problems using a variety of mental computations and reasonable estimation.	<b>Teacher's Edition:</b> 102a, 130a

## Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 1 Performance Objectives	Summer Success: Math, Grade 1
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 2. Make a simple pictograph or tally chart with appropriate labels from organized data.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 3. Interpret pictographs using terms such as most, least, equal, more than, less than, and greatest.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 4. Answer questions about pictographs using terms such as most, least, equal, more than, less than, and greatest.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 5. Formulate questions based on graphs, charts, and tables.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 6. Solve problems using graphs, charts, and tables.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122

## Strand 3: Patterns, Algebra and Functions

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically.

Grade 1 Performance Objectives	Summer Success: Math, Grade 1
PO 1. Communicate a grade-level appropriate pattern (e.g., $\leftarrow$ , $\square$ , $\heartsuit$ Repeat this complete pattern.)	<b>Teacher's Edition:</b> 6d, 12a, 14a, 22a, 27-28, 42a, 56a, 58a, 66a, 72c, 80a, 88a, 122a, 124a, 130a

Grade 1 Performance Objectives	Summer Success: Math, Grade 1
PO 2. Extend a simple grade-level appropriate repetitive pattern (e.g., $\_$ , $\_$ , $\_$ , $\_$ , $\_$ , $\_$ , $\_$ , $\_$ , $\_$ ).	<b>Teacher's Edition:</b> 6d, 12a, 13, 14a, 22a, 23, 42a, 43, 59, 66a, 72c, 110a, 111, 116c, 130a
PO 3. Create grade-level appropriate patterns.	<b>Teacher's Edition:</b> 6d, 12a, 14a, 19-20, 22a, 28, 42a, 44b, 64a, 66a, 67, 88a, 122a

### Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

Grade 1 Performance Objectives	Summer Success: Math, Grade 1
PO 2. Find the missing sum or difference in number sentences for sums and minuends through 9 (e.g., $2 + 5 = \_$ ).	<b>Teacher's Edition:</b> 36a, 37, 57, 58a, 68, 79, 80, 82, 86a, 89, 104, 110, 116c, 122a, 123-124, 124a, 125-126, 132a, 133

### Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 1 Performance Objectives	Summer Success: Math, Grade 1
PO 2. Identify 2-dimensional shapes by attribute (size, shape, number of sides, vertices).	<b>Teacher's Edition:</b> 28d, 34b, 36b, 42b, 44b, 56b, 64b, 65, 69-70, 78b, 88b, 116d, 129-130
PO 3. Use concepts and terms of position and size in contextual situations: <ul style="list-style-type: none"> <li>• Inside/outside,</li> <li>• Left/right,</li> <li>• Above/below/between,</li> <li>• Smaller/larger, and</li> <li>• Longer/shorter.</li> </ul>	<b>Teacher's Edition:</b> 25-26, 34b, 35, 47-48, 69-70, 132b
PO 4. Name common 2-dimensional shapes (square, rectangle, triangle, circle).	<b>Teacher's Edition:</b> 14b, 20b, 21, 64b
PO 5. Draw 2-dimensional shapes (square, rectangle, triangle, circle).	<b>Teacher's Edition:</b> 6e, 14b, 15, 22b, 45, 50d

<b>Grade 1 Performance Objectives</b>	<b>Summer Success: Math, Grade 1</b>
PO 6. Recognize where a line of symmetry divides a 2-dimensional shape into mirror images.	<b>Teacher's Edition:</b> 78b, 79, 86b, 88b, 122b

### **Concept 2: Transformation of Shapes**

**Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.**

<b>Grade 1 Performance Objectives</b>	<b>Summer Success: Math, Grade 1</b>
PO 1. Recognize same shape in different positions (slide/translations).	<b>Teacher's Edition:</b> 56b, 57, 66b, 72d, 116d, 117, 130b

### **Concept 4: Measurement-Units of Measure -Geometric Objects**

**Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.**

<b>Grade 1 Performance Objectives</b>	<b>Summer Success: Math, Grade 1</b>
PO 1. Compare the measurable characteristics of two objects (e.g., length, weight, size).	<b>Teacher's Edition:</b> 72d, 73, 132b
PO 2. Select the appropriate measure of accuracy: <ul style="list-style-type: none"> <li>● length – inches, feet,</li> <li>● capacity/volume – cups, gallons, and</li> <li>● mass/weight – pounds.</li> </ul>	<b>Teacher's Edition:</b> 14b, 64b, 100b
PO 3. Tell time to the hour using analog and digital clocks.	<b>Teacher's Edition:</b> 12b, 20b, 21, 36b, 37, 50d, 51, 78b, 102b, 103, 124b
PO 4. Name the days of the week for yesterday, today, and tomorrow (e.g., If today is Wednesday, what day will it be tomorrow?).	<b>Teacher's Edition:</b> 56b, 94d, 127-128, 130b, 131
PO 7. Measure a given object using the appropriate unit of measure: <ul style="list-style-type: none"> <li>● length – inches, feet and yards,</li> <li>● capacity/volume – cups, gallons, and</li> <li>● mass/weight – pounds.</li> </ul>	<b>Teacher's Edition:</b> 34b, 72d, 108b, 109, 110b, 116a



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## Arizona Mathematics Standard Articulated by Grade Level

### Grade 2

### Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Make a model to represent a given whole number 0 through 999.	<b>Teacher's Edition:</b> 28c-d, 63-64, 133
PO 2. Identify a whole number represented by a model with a word name and symbol 0 through 999.	<b>Teacher's Edition:</b> 12b, 20a, 28c-d, 44a, 133
PO 3. Count aloud, forward or backward, in consecutive order (0 through 999).	<b>Teacher's Edition:</b> 78b, 79, 116d, 127-128
PO 4. Identify whole numbers through 999 in or out of order.	<b>Teacher's Edition:</b> 7, 12b, 20a-b
PO 5. Write whole numbers through 999 in or out of order.	<b>Teacher's Edition:</b> 7, 12b, 28c-d
PO 6. State equivalent forms of whole numbers using multiples of 10 through 1,000 ( $430 + 200 = 600 + 30$ ).	<b>Teacher's Edition:</b> 23, 31-32, 36a, 37, 63-64, 79, 83, 94c
PO 7. State verbally whole numbers, through 999, using correct place value (e.g., A student will read <u>528</u> as five hundreds, two tens, and eight ones.).	<b>Teacher's Edition:</b> 12a, 14a-b, 15, 20a-b, 22a, 23, 36a, 879, 83

<b>Grade 2 Performance Objectives</b>	<b>Summer Success: Math, Grade 2</b>
PO 8. Construct models to represent place value concepts for the one's, ten's, and hundred's places.	<b>Teacher's Edition:</b> 12a, 14a-b, 36a, 64a, 66a, 72, 88a, 110a
PO 9. Apply expanded notation to model place value through 999 (e.g., $378 = 3 \text{ hundreds} + 7 \text{ tens} + 8 \text{ ones}$ ).	<b>Teacher's Edition:</b> 7, 14a-b, 22a, 23, 31-32, 58a, 83, 86a, 88a, 94c, 116c, 132a
PO 10. Identify odd and even (including 0) whole numbers through 999.	<b>Teacher's Edition:</b> 12a, 13, 22, 132a
PO 11. Compare two whole numbers through 999.	<b>Teacher's Edition:</b> 22, 31-32, 34a, 42a, 50a, 51, 53, 67, 102a
PO 12. Use ordinal numbers.	<b>Teacher's Edition:</b> 35, 45, 59, 64a, 78b, 80a, 81, 86a, 87, 100a
PO 13. Order three or more whole numbers through 999 (least to greatest or greatest to least).	<b>Teacher's Edition:</b> 34a, 35, 43, 59, 78b, 80a, 94c, 103, 110a, 124a
PO 14. Make models that represent given fractions (halves and fourths).	<b>Teacher's Edition:</b> 129-130
PO 15. Identify in symbols and words a model that is divided into equal fractional parts (halves and fourths).	<b>Teacher's Edition:</b> 102b, 108a, 129-130
PO 16. Count money through \$5.00 using manipulatives and pictures of bills and coins.	<b>Teacher's Edition:</b> 14b, 16, 20b, 21, 36b, 37, 65, 68, 80, 91, 96
PO 17. Identify the value of a collection of money using the symbols ¢ and \$ through \$5.00.	<b>Teacher's Edition:</b> 14b, 16, 20b, 21, 24, 36b, 37, 68, 80, 96, 124b, 133

## Concept 2: Numerical Operations

**Understand and apply numerical operations and their relationship to one another.**

<b>Grade 2 Performance Objectives</b>	<b>Summer Success: Math, Grade 2</b>
PO 1. Demonstrate the process of addition through two three-digit whole numbers, using manipulatives.	<b>Teacher's Edition:</b> 28c-d, 36, 39-40, 41-42, 43, 44, 50c, 61, 66a, 80a, 85-86, 86a, 88, 93-94, 97-98, 100a, 101, 119-120, 130a
PO 2. Demonstrate the process of subtraction using manipulatives with two-digit whole numbers.	<b>Teacher's Edition:</b> 78a

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 3. State addition and subtraction facts.	<b>Teacher's Edition:</b> 8, 9-10, 12a, 13, 14a-b, 15, 20a-b, 21, 22a, 23, 24, 25, 27, 28c-d, 259, 34b, 35, 36a-b, 37-38, 42a-b, 44a, 45, 47-48, 49, 50, 51, 56a, 57, 58b, 69, 72c, 73, 80, 82, 87, 88, 93-94, 94c, 95, 100a, 102a, 103, 124a
PO 4. Add one- and two-digit whole numbers with regrouping.	<b>Teacher's Edition:</b> 66a, 108a, 131
PO 5. Subtract one- and two-digit whole numbers with regrouping.	<b>Teacher's Edition:</b> 65
PO 6. Add 3 one- or two-digit addends.	<b>Teacher's Edition:</b> 22a, 36, 52, 59, 65, 82, 89, 109, 125, 132, 132a
PO 7. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 8, 38, 46, 52, 66, 67, 86a, 104, 113, 114, 122a, 124, 126, 132, 135-136
PO 8. Solve word problems using addition and subtraction of two 2-digit numbers, with regrouping AND two 3-digit numbers without regrouping.	<b>Teacher's Edition:</b> 61, 130a
PO 9. Count by multiples of three.	<b>Teacher's Edition:</b> 58a, 88a, 100a
PO 10. State multiplication facts: 2s, 5s and 10s.	<b>Teacher's Edition:</b> 102a, 108b, 122a, 123, 133
PO 12. Apply grade-level appropriate properties to assist in computation.	<b>Teacher's Edition:</b> 58a, 102
PO 13. Apply the symbols: +, -, x, $\div$ , =, $\neq$ , <, >, %.	<b>Teacher's Edition:</b> 31, 36, 36a, 37, 51, 67, 95, 102a, 103, 110a, 133
PO 14. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 28d, 35b, 36b, 42b, 44b, 48, 50d, 56b, 58b, 64b, 72c-d, 78b, 80b, 94d, 100b, 108b, 110b, 116d, 122b, 124b, 132b, 135-136
PO 15. Demonstrate addition of fractions with like denominators (halves and fourths) using models.	<b>Teacher's Edition:</b> 129-130, 137-138
PO 17. Add and subtract money without regrouping using manipulatives and paper and pencil, through \$5.00.	<b>Teacher's Edition:</b> 14b, 16, 20b, 21, 36b, 37, 58b, 59, 80, 105-106, 111, 124b, 132b, 133

### Concept 3: Estimation

Use estimation strategies reasonably and fluently.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Solve problems using a variety of mental computations and reasonable estimation.	<b>Teacher's Edition:</b> 72c, 102, 102a, 107-108, 111
PO 2. Estimate the measurement of an object using U.S. customary standard and non-standard units of measurement.	<b>Teacher's Edition:</b> 19-20, 22b, 28
PO 4. Evaluate the reasonableness of an estimate.	<b>Teacher's Edition:</b> 19-20, 28, 102a, 107-108

### Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 11-12
PO 2. Make a simple pictograph or tally chart with appropriate labels from organized data.	<b>Teacher's Edition:</b> 11-12, 33-34
PO 3. Interpret pictographs using terms such as most, least, equal, more than, less than, and greatest.	<b>Teacher's Edition:</b> 125
PO 4. Answer questions about a pictograph using terms such as most, least, equal, more than, less than, and greatest.	<b>Teacher's Edition:</b> 125
PO 5. Formulate questions based on graphs, charts, and tables.	<b>Teacher's Edition:</b> 11-12, 33-34, 44, 77
PO 6. Solve problems using graphs, charts, and tables.	<b>Teacher's Edition:</b> 11-12, 33-34, 77, 90, 99-100, 121-122

## Concept 2: Probability

Understand and apply the basic concepts of probability.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Name the possible outcomes for a probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 2. Predict the most likely or least likely outcome in probability experiments (e.g., Predict the chance of spinning one of the 2 colors on a 2-colored spinner.).	<b>Teacher's Edition:</b> 121-122
PO 3. Predict the outcome of a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 4. Record the data from performing a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 14, 121-122
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	<b>Teacher's Edition:</b> 121-122

## Concept 3: Discrete Mathematics – Systematic Listing and Counting

Understand and demonstrate the systematic listing and counting of possible outcomes.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Make arrangements that represent the number of combinations that can be formed by pairing items taken from 2 sets, using manipulatives (e.g., How many types of sandwiches can one make with 3 different types of fillings and 2 types of bread if only one type of bread and 1 kind of filling is used for each sandwich?).	<b>Teacher's Edition:</b> 44, 47, 48, 60, 66, 74, 80, 82, 90, 102, 112, 114

## Strand 3: Patterns, Algebra and Functions

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Communicate a grade-level appropriate pattern, using symbols or numbers (e.g., □, O, Δ, □, O, Δ, □, ____, ____, ____).	<b>Teacher's Edition:</b> 8, 12a, 15, 28c, 42a, 50d, 56a-b, 57, 58, 58a-b, 64a-b, 65, 66a-b, 72c-d, 78a, 101, 102a, 116c, 131
PO 2. Extend a grade-level appropriate repetitive pattern (e.g., 12, 22, 32, ____, ____, ____).	<b>Teacher's Edition:</b> 13, 20a, 22a, 29, 34a, 50d, 56a-b, 57, 58, 64a-b, 65, 80a, 88a, 89, 95, 122a
PO 3. Create grade-level appropriate patterns.	<b>Teacher's Edition:</b> 12a, 14a, 22a, 36a, 44, 44a, 50d, 67, 70, 100a, 108a, 124a, 130a

### Concept 2: Functions and Relationships

Describe and model functions and their relationships.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model, and frames and arrows).	<b>Teacher's Edition:</b> 108a

### Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 2. Find the missing element (addend, subtrahend, minuend, sum, and difference) in addition and subtraction number sentences for sums through 18 and minuends through 9 (e.g., $13 - \_ = 8$ ).	<b>Teacher's Edition:</b> 29, 34a, 35, 45, 57, 59, 73, 81, 94c, 108a, 109, 110a, 123, 125

## Concept 4: Analysis of Change

Analyze change in a variable over time and in various contexts.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Identify the change in a variable over time (e.g., an object gets taller, colder, heavier).	Teacher's Edition: 30, 92, 110
PO 2. Make simple predictions based on a variable (e.g., a child's height from year to year).	Teacher's Edition: 30

## Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

## Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Compare attributes of 2-dimensional shapes (square, rectangle, triangle, and circle).	Teacher's Edition: 14b, 20b, 21, 22b, 26, 28d, 29, 34b, 56b, 56b, 57, 58b, 66b, 72d, 75, 81, 86b, 89, 94d, 95, 100b, 102b, 103, 110a, 124b, 125, 132b
PO 2. Recognize congruent shapes.	Teacher's Edition: 12b, 36b, 37, 78b, 79, 116d
PO 3. Recognize line(s) of symmetry for a 2-dimensional shape.	Teacher's Edition: 22b, 24, 35, 50d, 80b, 81, 101

## Concept 2: Transformation of Shapes

Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Recognize same shape in different positions (flip/reflection).	Teacher's Edition: 12b, 42b, 43, 44b, 45, 122b

## Concept 4: Measurement-Units of Measure -Geometric Objects

**Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.**

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Identify the type of measure (e.g., weight, height, and time) for each attribute of an object.	<b>Teacher's Edition:</b> 88b, 130b
PO 2. Select the appropriate U.S. customary measure of accuracy: <ul style="list-style-type: none"> <li>• length – inches, feet, yards, miles,</li> <li>• capacity/volume – pints, quarts, and</li> <li>• mass/weight – ounces.</li> </ul>	<b>Teacher's Edition:</b> 88b, 94d, 102b
PO 3. Tell time to the quarter hour using analog and digital clocks.	<b>Teacher's Edition:</b> 17-18, 28d, 29, 44b, 45, 50d, 51, 80b, 81, 102b, 103, 122b, 129-130
PO 4. Determine the passage of time using units of days and weeks within a month using a calendar.	<b>Teacher's Edition:</b> 78b, 79, 116d, 127-128
PO 6. Measure a given object using the appropriate unit of measure: <ul style="list-style-type: none"> <li>• length – inches, miles,</li> <li>• capacity/volume – pints, quarts, and</li> <li>• mass/weight – ounces.</li> </ul>	<b>Teacher's Edition:</b> 12b, 13, 19-20, 22b, 28, 34b, 42b, 43, 56b, 57, 64b, 72d, 73, 86b, 99-100, 100b, 108b

## Strand 5: Structure and Logic

**Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.**

## Concept 1: Algorithms and Algorithmic Thinking

**Use reasoning to solve mathematical problems in contextual situations.**

Grade 2 Performance Objectives	Summer Success: Math, Grade 2
PO 1. Create contextual problems that require addition or subtraction with one- or two-digit numbers.	<b>Teacher's Edition:</b> 82



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## correlated to

### Arizona Mathematics Standard Articulated by Grade Level Grade 3

#### Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

#### Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 1. Read whole numbers in contextual situations (through six-digit numbers).	<b>Teacher's Edition:</b> 8, 14, 16, 22, 116d, 132a,
PO 2. Identify six-digit whole numbers in or out of order.	<b>Teacher's Edition:</b> 36a
PO 3. Write whole numbers through six-digits in or out of order.	<b>Teacher's Edition:</b> 22a, 35, 36a, 44a, 71, 116d
PO 4. State whole numbers, through six-digits, with correct place value, by using models, illustrations, symbols, or expanded notation (e.g., $53,941 = 50,000 + 3,000 + 900 + 40 + 1$ ).	<b>Teacher's Edition:</b> 6d, 7, 9-10, 12a, 14a, 15, 22a, 28c, 34a, 35, 43, 50c, 51, 64a, 65, 67, 86a, 87, 108a, 116d, 117, 132a
PO 5. Construct models to represent place value concepts for the one's, ten's, and hundred's places.	<b>Teacher's Edition:</b> 6d
PO 6. Apply expanded notation to model place value through 9,999 (e.g., $5,378 = 5,000 + 300 + 70 + 8$ ).	<b>Teacher's Edition:</b> 9-10, 15, 22a, 23, 28c, 29, 42a, 50c, 51, 64a, 65, 66a, 67, 86a, 87, 108a, 116d, 117, 132a
PO 7. Sort whole numbers into sets containing only odd numbers or only even numbers.	<b>Teacher's Edition:</b> 24, 56a, 57, 58a, 59
PO 8. Compare two whole numbers, through six-digits.	<b>Teacher's Edition:</b> 9-10, 13, 37, 64a, 65, 122a

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 9. Order three or more whole numbers through six-digit numbers (least to greatest, or greatest to least).	<b>Teacher's Edition:</b> 14a, 22a, 34a, 35, 36a, 44a, 45, 66a, 109, 123
PO 10. Make models that represent proper fractions (halves, thirds, fourths, eighths, and tenths).	<b>Teacher's Edition:</b> 72a, 73, 78a, 79, 80a, 81, 85-86, 94, 94c, 97-98, 109
PO 11. Identify symbols, words, or models that represent proper fractions (halves, thirds, fourths, eighths and tenths).	<b>Teacher's Edition:</b> 80a, 88a, 89, 94c, 95, 100a, 101, 102a, 105-106, 110a, 124a
PO 12. Use proper fractions in contextual situations.	<b>Teacher's Edition:</b> 92
PO 13. Compare two proper fractions with like denominators.	<b>Teacher's Edition:</b> 100a, 101, 103, 105-106, 110a, 111, 133
PO 14. Order three or more proper fractions with like denominators (halves, thirds, fourths, eighths, and tenths).	<b>Teacher's Edition:</b> 124a, 126
PO 15. Count amounts of money through \$20.00 using pictures or actual bills and coins. PO 15. Count amounts of money through \$20.00 using pictures or actual bills and coins.	<b>Teacher's Edition:</b> 6e, 7, 8, 12b, 14b, 17-18, 19-20, 20b, 22b, 28, 28c, 29, 48, 72d, 78b, 79, 94d, 95, 124
PO 16. Use decimals through hundredths in contextual situations.	<b>Teacher's Edition:</b> 6e, 12b, 14b, 17-18, 19-20, 20b, 95
PO 19. Determine the equivalency among decimals, fractions, and percents (e.g., half-dollar = 50¢ = 50% and $1/4 = 0.25 = 25%$ ).	<b>Teacher's Edition:</b> 6e, 7, 80a, 130a, 131, 132a, 132b

## Concept 2: Numerical Operations

**Understand and apply numerical operations and their relationship to one another.**

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 1. Demonstrate the process of subtraction using manipulatives through three-digit whole numbers.	<b>Teacher's Edition:</b> 19-20, 32-33, 61-62, 72a
PO 2. Add two three-digit whole numbers.	<b>Teacher's Edition:</b> 56a, 57, 58, 81, 116d, 122a, 123
PO 3. Subtract two three-digit whole numbers.	<b>Teacher's Edition:</b> 87, 89, 108a, 109, 117, 122a, 123

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 4. Add a column of numbers.	<b>Teacher's Edition:</b> 17-18, 22, 51, 56a, 66a, 67, 82, 125
PO 5. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 25-26, 28c, 34a, 36, 38, 44, 47-48, 52, 58, 60, 66, 68, 69-70, 74, 80, 88, 91-92, 96, 102, 104, 110, 113, 114, 124, 126, 132, 134, 135-136
PO 6. Solve word problems using grade-level appropriate operations and numbers.	<b>Teacher's Edition:</b> 25-26, 28c, 34a, 36, 38, 44, 47-48, 52, 58, 60, 66, 68, 69-70, 74, 80, 88, 91-92, 96, 102, 104, 110, 113, 114, 124, 126, 132, 134, 135-136
PO 7. Demonstrate the process of multiplication as repeatedly adding the same number, counting by multiples, combining equal sets, and making arrays.	<b>Teacher's Edition:</b> 6d, 7, 12a, 13, 14a, 15-16, 20a, 21, 22a, 29, 30, 34a, 35-36, 36a, 37, 42b, 44a, 45, 64a, 65, 72a, 74, 78a, 82, 86a, 88a, 89, 110a, 111, 124a, 125
PO 8. Demonstrate the process of division with one-digit divisors (separating elements of a set into smaller equal sets, sharing equally, or repeatedly subtracting the same number).	<b>Teacher's Edition:</b> 103, 107-108, 116, 119-120, 130b, 131
PO 9. Demonstrate families of equations for multiplication and division through 9s.	<b>Teacher's Edition:</b> 89, 94a, 100a, 101, 102a, 130a, 131
PO 10. State multiplication and division facts through 9s.	<b>Teacher's Edition:</b> 12a, 13, 20a, 23, 28c, 36a, 39-40, 78a, 102a, 108a, 110a
PO 12. Identify multiplication and division as inverse operations.	<b>Teacher's Edition:</b> 94c, 100a, 101, 102a, 111
PO 13. Apply grade-level appropriate properties to assist in computation.	<b>Teacher's Edition:</b> 72a, 80a, 88a
PO 14. Apply the symbols: $\leftrightarrow$ , $\left  \right.$ , $/$ , $*$ , $\%$ , and the grouping symbols $()$ and $“”$ .	<b>Teacher's Edition:</b> 89
PO 15. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6e, 12b, 14b, 20b, 22b, 28d, 34b, 36b, 42b, 44b, 50d, 56b, 58b, 64b, 72d, 78b, 80b, 86b, 88b, 94d, 100b, 102b, 108b, 116d, 122b, 124b, 130b, 132b
PO 17. Apply addition and subtraction in contextual situations, through \$20.00.	<b>Teacher's Edition:</b> 8, 16, 19-20, 95

### Concept 3: Estimation

Use estimation strategies reasonably and fluently.

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 1. Solve grade-level appropriate problems using estimation.	<b>Teacher's Edition:</b> 72a, 80a, 88a, 116c, 122b
PO 2. Estimate length and weight using U.S. customary units.	<b>Teacher's Edition:</b> 122b
PO 3. Record estimated and actual linear measurements for real-life objects (e.g., length of fingernail; height of desk).	<b>Teacher's Edition:</b> 122b
PO 4. Compare estimations of appropriate measures to the actual measures.	<b>Teacher's Edition:</b> 122b
PO 5. Evaluate the reasonableness of estimated measures.	<b>Teacher's Edition:</b> 122b

### Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 121-122
PO 2. Construct a horizontal bar, vertical bar, pictograph, or tally chart with appropriate labels and title from organized data.	<b>Teacher's Edition:</b> 33-34, 77-78, 99-100, 118, 121-122
PO 3. Interpret data found in line plots, pictographs, and single-bar graphs (horizontal and vertical).	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 4. Answer questions based on data found in line plots, pictographs, and single-bar graphs (horizontal and vertical).	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 5. Formulate questions based on graphs, charts, and tables to solve problems.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 6. Solve problems using graphs, charts and tables.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122

### **Concept 2: Probability**

**Understand and apply the basic concepts of probability.**

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 1. Name the possible outcomes for a probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 2. Make predictions about the probability of events being more likely, less likely, equally likely or unlikely.	<b>Teacher's Edition:</b> 121-122
PO 3. Predict the outcome of a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 4. Record the data from performing a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	<b>Teacher's Edition:</b> 121-122

### **Strand 3: Patterns, Algebra and Functions**

**Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.**

### **Concept 1: Patterns**

**Identify patterns and apply pattern recognition to reason mathematically.**

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 1. Communicate a grade-level appropriate iterative pattern, using symbols or numbers.	<b>Teacher's Edition:</b> 8, 12a, 14, 14a, 20a, 28c, 66a, 110, 122a, 123

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 2. Extend a grade-level appropriate repetitive pattern (e.g., 5, 10, 15, 20, . . . rule: add five or count by five's).	<b>Teacher's Edition:</b> 6d, 12a, 14, 15, 22a, 56a, 116c, 132a
PO 3. Solve grade-level appropriate pattern problems.	<b>Teacher's Edition:</b> 8, 50d

## Concept 2: Functions and Relationships

Describe and model functions and their relationships.

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 1. Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model, and frames and arrows).	<b>Teacher's Edition:</b> 124a, 132

## Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 2. Solve equations with one variable using missing addends to sums of 18 (e.g., $\square + 9 = 18$ , $9 + \square = 18$ ); and using minuend through 18 (e.g., $18 - \square = 9$ , $18 - 9 = \square$ ).	<b>Teacher's Edition:</b> 24, 29, 37, 59, 64b, 67, 101, 104

## Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. **Communication, Problem-solving, Reasoning & Proof, Connections, and Representation** are the process standards that are embedded throughout the teaching and learning of mathematical strands.

## Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 2. Name concrete objects and pictures of 3-dimensional solids (cones, spheres, and cubes).	<b>Teacher's Edition:</b> 6e, 22b, 23, 27, 28d, 90, 124b, 125, 130b, 132b, 133
PO 3. Describe relationships between 2-dimensional and 3-dimensional objects (squares/cubes, circles/spheres, triangles/cones).	<b>Teacher's Edition:</b> 78b, 80b, 83-84, 90, 94d, 113, 114, 127, 128

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 4. Recognize similar shapes.	<b>Teacher's Edition:</b> 6e, 14b, 28d, 29, 50d, 64b, 66, 116d
PO 5. Identify a line of symmetry in a 2-dimensional shape.	<b>Teacher's Edition:</b> 34b, 36b, 45, 49, 122b

### **Concept 2: Transformation of Shapes**

**Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.**

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 1. Recognize same shape in different positions (turn/rotation).	<b>Teacher's Edition:</b> 100b, 101, 102b, 108b, 109, 110b, 118

### **Concept 4: Measurement-Units of Measure -Geometric Objects**

**Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.**

<b>Grade 3 Performance Objectives</b>	<b>Summer Success: Math, Grade 3</b>
PO 1. Select the appropriate measure of accuracy: <ul style="list-style-type: none"> <li>● length – centimeters, meters, kilometers,</li> <li>● capacity/volume – liters, and</li> <li>● mass/weight – grams.</li> </ul>	<b>Teacher's Edition:</b> 50d, 56b, 58b, 60, 64b, 86b, 88, 88b, 91, 94d, 96, 102b, 122b, 124b, 126
PO 2. Tell time with one-minute precision (analog).	<b>Teacher's Edition:</b> 28d, 30, 34b, 36, 36b, 41-42, 42b, 44, 44b, 46, 47, 50, 52, 94d, 95, 116d, 132b
PO 4. Measure a given object using the appropriate unit of measure: <ul style="list-style-type: none"> <li>● length – centimeters, millimeters, meters, kilometers,</li> <li>● capacity/volume – liters, and</li> <li>● mass/weight – grams.</li> </ul>	<b>Teacher's Edition:</b> 63-64, 65, 66b, 72, 80, 80b, 82, 93, 108b, 134
PO 5. Record temperatures to the nearest degree in degrees Fahrenheit and degrees Celsius as shown on a thermometer.	<b>Teacher's Edition:</b> 11-12, 75-76

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 6. Compare units of measure to determine more or less relationships for: <ul style="list-style-type: none"> <li>• length – inches to feet; centimeters to meters,</li> <li>• time – minutes to hours; hours to days; days to weeks; months to years, and</li> <li>• money – pennies, nickels, dimes, quarters, and dollars.</li> </ul>	<b>Teacher’s Edition:</b> 66b, 68, 74, 103, 134
PO 7. Determine relationships for: <ul style="list-style-type: none"> <li>• volume – cups and gallons,</li> <li>• weight – ounces and pounds, and</li> <li>• money – extend to amounts greater than one dollar.</li> </ul>	<b>Teacher’s Edition:</b> 97-98, 100b, 110, 110b, 112, 115, 130b
PO 9. Determine the perimeter using a rectangular array.	<b>Teacher’s Edition:</b> 129-130, 138
PO 10. Represent area using a rectangular array.	<b>Teacher’s Edition:</b> 129-130, 138

### Strand 5: Structure and Logic

**Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.**

### Concept 1: Algorithms and Algorithmic Thinking

**Use reasoning to solve mathematical problems in contextual situations.**

Grade 3 Performance Objectives	Summer Success: Math, Grade 3
PO 1. Discriminate necessary information from unnecessary information in a given grade-level appropriate word problem.	<b>Teacher’s Edition:</b> 25-26, 28c, 34a, 36, 38, 44, 47-48, 52, 58, 60, 66, 68, 69-70, 74, 80, 88, 91-92, 96, 102, 104, 110, 113, 114, 124, 126, 132, 134, 135-136



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## Arizona Mathematics Standard Articulated by Grade Level

### Grade 4

### Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade 4 Performance Objectives	Summer Success: Math, Grade 4
PO 1. Read whole numbers in contextual situations.	Teacher's Edition: 6d, 12a, 14a
PO 2. Identify whole numbers in or out of order.	Teacher's Edition: 6e
PO 3. Write whole numbers in or out of order.	Teacher's Edition: 6d
PO 4. State place values for whole numbers (e.g., In the number 203,495 what is the value of the 2?).	Teacher's Edition: 14a, 15, 22a, 66a
PO 5. Construct models to represent place value concepts for the one's, ten's, hundred's, and thousand's places.	Teacher's Edition: 9-10, 13, 15, 17-18, 19-20, 28
PO 6. Apply expanded notation to model place value (e.g., $203,495 = 200,000 + 3,000 + 400 + 90 + 5$ ).	Teacher's Edition: 7, 9-10, 13, 15, 22a, 30
PO 7. Compare two whole numbers.	Teacher's Edition: 12a, 13, 22a, 23, 56a, 57, 65, 66a
PO 8. Order three or more whole numbers.	Teacher's Edition: 15, 22a, 23
PO 9. Make models that represent mixed numbers.	Teacher's Edition: 107-108, 116c, 125

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 10. Identify symbols, words, or models that represent mixed numbers.	<b>Teacher's Edition:</b> 117, 122a
PO 11. Use mixed numbers in contextual situations.	<b>Teacher's Edition:</b> 103, 107-108, 117, 123
PO 12. Compare two unit fractions (e.g., $\frac{1}{2}$ to $\frac{1}{5}$ ) or proper or mixed numbers with like denominators.	<b>Teacher's Edition:</b> 122a, 130a, 131
PO 14. Use decimals in contextual situations.	<b>Teacher's Edition:</b> 72c, 73, 78a, 80a, 94c, 101, 102a, 108a, 109, 111
PO 15. Compare two decimals.	<b>Teacher's Edition:</b> 86a, 87, 88a, 95, 107-108
PO 17. Determine the equivalency among decimals, fractions, and percents (e.g., $\frac{49}{100} = 0.49 = 49\%$ ).	<b>Teacher's Edition:</b> 73, 78a, 80a, 81, 86a, 87, 94c, 100a, 102a, 110a, 117, 133
PO 18. Identify all whole number factors and pairs of factors for a given whole number through 144.	<b>Teacher's Edition:</b> 28c, 29, 34a, 35, 44a, 50c, 51, 58a, 59, 128-129
PO 19. Determine multiples of a given whole number with products through 144.	<b>Teacher's Edition:</b> 25, 36a, 37, 41-42, 42a, 43, 44a, 47, 49

## Concept 2: Numerical Operations

**Understand and apply numerical operations and their relationship to one another.**

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 1. Add whole numbers.	<b>Teacher's Edition:</b> 7, 8, 12a, 13, 14a, 17-18, 20a-b, 21-22, 22a, 24, 36, 44, 52, 61-62, 110
PO 2. Subtract whole numbers.	<b>Teacher's Edition:</b> 12a, 13, 20a, 21-22, 22a, 24, 31-32
PO 3. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 8, 14, 15, 22, 24, 35, 38, 44, 46, 52, 60, 87-88
PO 4. Solve word problems using grade-level appropriate operations and numbers.	<b>Teacher's Edition:</b> 8, 14, 15, 22, 24, 35, 38, 44, 46, 52, 60, 87-88
PO 5. Multiply multi-digit numbers by two-digit numbers.	<b>Teacher's Edition:</b> 39-40, 67-68
PO 6. Divide with one-digit divisors.	<b>Teacher's Edition:</b> 28c, 53-54, 67-68

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 7. State multiplication and division facts through 12s.	<b>Teacher's Edition:</b> 28c, 34a, 35, 36a, 37, 39-40, 42a, 43, 44, 44a, 45, 50c, 51, 56a, 57, 58a, 59, 64a, 65, 66a, 67
PO 8. Demonstrate the associative property of multiplication.	<b>Teacher's Edition:</b> 14a
PO 9. Apply grade-level appropriate properties to assist in computation.	<b>Teacher's Edition:</b> 42a, 43, 60, 64a, 72c, 80a, 87, 116c, 122a, 130a
PO 11. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6e, 12b, 14b, 20b, 22a, 28d, 34b, 36b, 42b, 44b, 50d, 56b, 64b, 72d, 78b, 86b, 94d, 108b, 110b, 116c, 124b, 130b
PO 12. Add or subtract fractions with like denominators, no regrouping.	<b>Teacher's Edition:</b> 78a, 79, 80a, 81, 86a, 87, 88a, 89, 91, 94c, 95, 100b, 102a, 102b, 103, 108a, 109, 116c, 117, 122a, 123-124, 124b, 125, 130a, 131, 132a
PO 13. Simplify numerical expressions using the order of operations with grade-appropriate operations on number sets.	<b>Teacher's Edition:</b> 64a

### **Concept 3: Estimation**

**Use estimation strategies reasonably and fluently.**

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 1. Solve grade-level appropriate problems using estimation.	<b>Teacher's Edition:</b> 22b, 34a, 35, 63-64, 64a, 65, 66a, 67, 72, 73, 101, 102b, 103, 108a, 110, 110a, 111
PO 2. Use estimation to verify the reasonableness of a calculation (e.g., Is $3284 \times 343 = 1200$ reasonable?).	<b>Teacher's Edition:</b> 65, 66a, 67, 101
PO 3. Estimate length and weight using both U.S. customary and metric units.	<b>Teacher's Edition:</b> 22b, 26, 80b

## Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 4 Performance Objectives	Summer Success: Math, Grade 4
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 2. Construct a single-bar graph, line graph or two-set Venn diagram with appropriate labels and title from organized data.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 3. Interpret graphical representations and data displays including single-bar graphs, circle graphs, two-set Venn diagrams, and line graphs that display continuous data.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122
PO 4. Answer questions based on graphical representations and data displays including single-bar graphs, circle graphs, two-set Venn diagrams, and line graphs that display continuous data.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 81, 99-100, 121-122
PO 5. Identify the mode(s) of given data.	<b>Teacher's Edition:</b> 77-78, 99-100, 121-122
PO 6. Formulate predictions from a given set of data.	<b>Teacher's Edition:</b> 77-78, 99-100, 121-122
PO 7. Solve contextual problems using graphs, charts, and tables.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100, 121-122

## Strand 3: Patterns, Algebra and Functions

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically.

Grade 4 Performance Objectives	Summer Success: Math, Grade 4
PO 1. Communicate a grade-level appropriate iterative pattern, using symbols or numbers.	<b>Teacher's Edition:</b> 20a, 36a, 37, 45, 100a
PO 2. Extend a grade-level appropriate iterative pattern.	<b>Teacher's Edition:</b> 20a, 21, 22a, 36a, 37, 44a, 45, 100a
PO 3. Create grade-level appropriate iterative patterns.	<b>Teacher's Edition:</b> 45, 100a

### Concept 2: Functions and Relationships

Describe and model functions and their relationships.

Grade 4 Performance Objectives	Summer Success: Math, Grade 4
PO 1. Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).	<b>Teacher's Edition:</b> 50c, 56a, 57, 58a, 66a, 67, 86a, 87, 88a, 90, 96, 102, 132

## Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 4 Performance Objectives	Summer Success: Math, Grade 4
PO 1. Identify the properties of 2-dimensional figures using appropriate terminology.	<b>Teacher's Edition:</b> 12b, 14b, 16, 20b, 22, 27, 29, 34b, 42b, 44b, 46, 48, 56b, 69, 75-76, 116d, 119-120, 122b, 132b
PO 2. Identify models or illustrations of prisms, pyramids, cones, cylinders, and spheres.	<b>Teacher's Edition:</b> 70, 72d, 73, 75-76, 78b, 80b, 81-82, 86b, 90, 93, 124b, 130b, 131, 132b

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 3. Draw points, lines, line segments (open or closed endpoints), rays, or angles.	<b>Teacher's Edition:</b> 58b, 59, 60, 64b, 122b, 123
PO 4. Classify angles (e.g., right, acute, obtuse, straight).	<b>Teacher's Edition:</b> 50d, 51, 56b, 66b, 71, 118
PO 5. Classify triangles as right, acute, or obtuse.	<b>Teacher's Edition:</b> 14b, 15, 22b, 44
PO 6. Identify congruent geometric shapes.	<b>Teacher's Edition:</b> 36b, 108b
PO 7. Identify similar shapes.	<b>Teacher's Edition:</b> 46
PO 8. Draw a 2-dimensional shape that has line symmetry.	<b>Teacher's Edition:</b> 7, 23, 28d, 37

### **Concept 2: Transformation of Shapes**

**Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.**

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 1. Demonstrate translation using geometric figures.	<b>Teacher's Edition:</b> 94d, 100b, 101, 102b, 105-106, 110b, 112

### **Concept 3: Coordinate Geometry**

**Specify and describe spatial relationships using coordinate geometry and other representational systems.**

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 1. Name the coordinates of a point plotted in the first quadrant.	<b>Teacher's Edition:</b> 94c, 95, 104

### **Concept 4: Measurement-Units of Measure -Geometric Objects**

**Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.**

<b>Grade 4 Performance Objectives</b>	<b>Summer Success: Math, Grade 4</b>
PO 1. Identify the appropriate measure of accuracy for the area of an object (e.g., sq. feet or sq. miles).	<b>Teacher's Edition:</b> 6e, 7, 12b, 85-86, 86b, 94, 94d, 110b, 111
PO 2. Compute elapsed time using a clock (e.g., hours and minutes since or until...) or a calendar (e.g., days, weeks, years since or until...).	<b>Teacher's Edition:</b> 14b, 28d, 29, 36, 36b, 44b, 50d, 57-58, 64b, 108b

Grade 4 Performance Objectives	Summer Success: Math, Grade 4
PO 3. Select an appropriate tool to use in a particular measurement situation.	<b>Teacher's Edition:</b> 6e, 85-86, 94
PO 4. Approximate measurements to the appropriate degree of accuracy.	<b>Teacher's Edition:</b> 85-86, 94d
PO 5. Compare units of measure to determine <i>more or less</i> relationships including: <ul style="list-style-type: none"> <li>length - yards and miles, meters and kilometers, and</li> <li>weight - pounds and tons, grams and kilograms.</li> </ul>	<b>Teacher's Edition:</b> 92, 100b, 104, 110b, 124a, 130b, 133
PO 6. State equivalent relationships (e.g., 3 teaspoons = 1 tablespoon, 16 cups = 1 gallon, 2000 pounds = 1 ton).	<b>Teacher's Edition:</b> 42b, 78b, 82, 83-84, 88b
PO 7. Compare the weight of two objects using both U.S. customary and metric units.	<b>Teacher's Edition:</b> 66, 88b
PO 8. Determine the perimeter of simple polygons (e.g., square, rectangle, triangle).	<b>Teacher's Edition:</b> 34b, 44b, 49, 68, 78a, 79, 90, 122b, 124, 129-130
PO 9. Determine the area of squares and rectangles.	<b>Teacher's Edition:</b> 56b, 58b, 59, 66b, 72d, 124b, 126, 129-130, 132, 132b, 133-134
PO 10. Differentiate between perimeter and area of quadrilaterals.	<b>Teacher's Edition:</b> 129-130, 138

## Strand 5: Structure and Logic

**Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.**

### Concept 1: Algorithms and Algorithmic Thinking

**Use reasoning to solve mathematical problems in contextual situations.**

Grade 4 Performance Objectives	Summer Success: Math, Grade 4
PO 1. Discriminate necessary information from unnecessary information in a given grade-level appropriate word problem.	<b>Teacher's Edition:</b> 8, 14, 15, 22, 24, 35, 38, 44, 46, 52, 60, 87-88
PO 2. Develop an algorithm to calculate the perimeter of simple polygons.	<b>Teacher's Edition:</b> 34b, 44b, 49, 68, 78a, 79, 90, 124



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## Arizona Mathematics Standard Articulated by Grade Level

### Grade 5

### Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 4. Compare two proper fractions or improper fractions with like denominators.	<b>Teacher's Edition:</b> 9-10, 12a, 72c
PO 5. Order three or more unit fractions, proper or improper fractions with like denominators, or mixed numbers with like denominators.	<b>Teacher's Edition:</b> 34a, 35, 37, 43-44, 135
PO 6. Compare two whole numbers, fractions, and decimals (e.g., $1/2$ to 0.6).	<b>Teacher's Edition:</b> 9-10, 15, 20a, 22a, 28c, 29, 50c, 51, 56a, 57, 58a, 59, 64a, 78a, 80, 80a, 82, 83-84, 88a
PO 7. Order whole numbers, fractions, and decimals.	<b>Teacher's Edition:</b> 34a, 35, 37, 43-44, 66a, 67, 73, 115
PO 8. Determine the equivalency between and among fractions, decimals, and percents in contextual situations.	<b>Teacher's Edition:</b> 36a, 41-42, 42a, 44a, 45, 72c, 73, 79, 80a, 81, 86a, 87, 88a, 89
PO 9. Identify all whole number factors and pairs of factors for a number.	<b>Teacher's Edition:</b> 61-62
PO 10. Recognize that 1 is neither a prime nor a composite number.	<b>Teacher's Edition:</b> 130a, 131, 132a, 133

<b>Grade 5 Performance Objectives</b>	<b>Summer Success: Math, Grade 5</b>
PO 11. Sort whole numbers (through 50) into sets containing only prime numbers or only composite numbers.	<b>Teacher's Edition:</b> 119-120, 130a, 131, 132a, 133, 136

## **Concept 2: Numerical Operations**

**Understand and apply numerical operations and their relationship to one another.**

<b>Grade 5 Performance Objectives</b>	<b>Summer Success: Math, Grade 5</b>
PO 1. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 8, 16, 46, 47-48, 58, 69-70, 91-92, 112, 118, 126, 134
PO 2. Solve word problems using grade-level appropriate operations and numbers.	<b>Teacher's Edition:</b> 8, 16, 46, 47-48, 58, 69-70, 91-92, 112, 118, 126, 134
PO 3. Multiply whole numbers.	<b>Teacher's Edition:</b> 47, 52, 80, 97-98, 100a, 102a, 103, 108a, 109, 123
PO 4. Divide with whole numbers.	<b>Teacher's Edition:</b> 47, 80, 122a, 123, 124a, 125, 130a, 131
PO 6. Demonstrate the addition and multiplication properties of equality.	<b>Teacher's Edition:</b> 116c
PO 7. Apply grade-level appropriate properties to assist in computation.	<b>Teacher's Edition:</b> 116c, 130a
PO 8. Apply the symbol “[ ]” to represent grouping.	<b>Teacher's Edition:</b> 46, 130a
PO 9. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6e, 12b, 14b, 20b, 22b, 28d, 34b, 36b, 42b, 56b, 58b, 64b, 72d, 78b, 80b, 86b, 94d, 100b, 102b, 108b, 116d, 124b, 130b
PO 10. Simplify fractions to lowest terms.	<b>Teacher's Edition:</b> 65, 78a, 88a
PO 12. Add or subtract decimals.	<b>Teacher's Edition:</b> 12a, 13-14, 14a, 15, 17-18, 20a, 21, 22a, 23, 25, 31-32, 34a, 35-36, 36a, 37, 42a, 43, 45, 50c, 51, 56a, 58a, 59, 64a, 65, 66a, 67-68
PO 13. Multiply decimals.	<b>Teacher's Edition:</b> 28c, 29, 42a, 43, 44a, 45, 58a, 64a
PO 15. Simplify numerical expressions using the order of operations with grade- appropriate operations on number sets.	<b>Teacher's Edition:</b> 46, 66a, 80, 130a, 131, 132a

### Concept 3: Estimation

Use estimation strategies reasonably and fluently.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Solve grade-level appropriate problems using estimation.	<b>Teacher's Edition:</b> 53-54, 105-106, 127-128
PO 3. Round to estimate quantities.	<b>Teacher's Edition:</b> 36a, 37, 53-54, 99-100, 105-106
PO 4. Estimate and measure for area and perimeter.	<b>Teacher's Edition:</b> 133
PO 5. Compare estimated measurements between U.S. customary and metric systems (e.g., A yard is about a meter.).	<b>Teacher's Edition:</b> 63-64

### Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 99-100
PO 2. Construct a double-bar graph, line plot, frequency table, or three-set Venn diagram with appropriate labels and title from organized data.	<b>Teacher's Edition:</b> 11-12, 33-34, 55-56, 77-78, 99-100
PO 3. Interpret graphical representations and data displays including bar graphs (including double-bar), circle graphs, frequency tables, three-set Venn diagrams, and line graphs that display continuous data.	<b>Teacher's Edition:</b> 33-34, 55-56, 60, 99-100
PO 4. Answer questions based on graphical representations, and data displays including bar graphs (including double-bar), circle graphs, frequency tables, three-set Venn diagrams, and line graphs that display continuous data.	<b>Teacher's Edition:</b> 11-12, 16, 33-34, 99-100

<b>Grade 5 Performance Objectives</b>	<b>Summer Success: Math, Grade 5</b>
PO 5. Identify the mode(s) and mean (average) of given data.	<b>Teacher's Edition:</b> 60, 77-78, 92

## Concept 2: Probability

**Understand and apply the basic concepts of probability.**

<b>Grade 5 Performance Objectives</b>	<b>Summer Success: Math, Grade 5</b>
PO 1. Name the possible outcomes for a probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 2. Describe the probability of events as being: <ul style="list-style-type: none"> <li>• certain (represented by "1"),</li> <li>• impossible, (represented by "0"), or</li> <li>• neither certain nor impossible (represented by a fraction less than 1).</li> </ul>	<b>Teacher's Edition:</b> 121-122
PO 3. Predict the outcome of a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 4. Record the data from performing a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 121-122
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	<b>Teacher's Edition:</b> 121-122
PO 6. Make predictions from the results of student-generated experiments using objects (e.g., coins, spinners, number cubes).	<b>Teacher's Edition:</b> 121-122

## Strand 3: Patterns, Algebra and Functions

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Communicate a grade-level appropriate iterative pattern, using symbols or numbers.	<b>Teacher's Edition:</b> 6d, 7, 12a, 13, 14a, 20a, 22a, 27, 28c, 36a, 42a, 43, 44a, 50c, 56a, 58a, 59, 68, 72a, 78a, 80, 80a, 87, 108a, 122a-b, 124a
PO 2. Extend a grade-level appropriate iterative pattern.	<b>Teacher's Edition:</b> 6d, 7, 12a, 13, 14a, 20a, 22a, 27, 28c, 36a, 42a, 43, 44a, 50c, 56a, 58a, 59, 68, 72a, 78a, 80, 80a, 87, 108a, 122a-b, 124a
PO 3. Solve grade-level appropriate iterative pattern problems.	<b>Teacher's Edition:</b> 6d, 7, 12a, 13, 14a, 20a, 22a, 27, 28c, 36a, 42a, 43, 44a, 50c, 56a, 58a, 59, 68, 72a, 78a, 80, 80a, 87, 108a, 122a-b, 124a

### Concept 2: Functions and Relationships

Describe and model functions and their relationships.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).	<b>Teacher's Edition:</b> 6d, 7, 13, 27, 28c, 36a, 42a, 43, 44a, 60, 86a, 87, 88a, 94c

### Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 2. Use variables in contextual situations.	<b>Teacher's Edition:</b> 42b, 100a, 101, 102a, 108a, 110a, 111
PO 3. Solve one-step equations with one variable represented by a letter or symbol (e.g., $15 = 45 \div n$ ).	<b>Teacher's Edition:</b>

## Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Recognize regular polygons.	<b>Teacher's Edition:</b> 6e, 48, 132b
PO 2. Draw 2-dimensional figures by applying significant properties of each (e.g., Draw a quadrilateral with two sets of parallel sides and four right angles.).	<b>Teacher's Edition:</b> 102
PO 3. Sketch prisms, pyramids, cones, and cylinders.	<b>Teacher's Edition:</b> 102b
PO 4. Identify the properties of 2- and 3-dimensional geometric figures using appropriate terminology and vocabulary.	<b>Teacher's Edition:</b> 50d, 57, 64b, 102b
PO 5. Draw points, lines, line segments, rays, and angles with appropriate labels.	<b>Teacher's Edition:</b> 28d, 29, 34b, 42b, 45-46, 108b, 110b
PO 7. Classify triangles as scalene, isosceles, or equilateral.	<b>Teacher's Edition:</b> 20b, 21, 22b, 108b, 110b, 114
PO 9. Identify the diameter, radius, and circumference of a circle.	<b>Teacher's Edition:</b> 64b, 66
PO 10. Understand that the sum of the angles of a triangle is $180^\circ$ .	<b>Teacher's Edition:</b> 34b
PO 11. Draw two congruent geometric figures.	<b>Teacher's Edition:</b> 14b, 15
PO 13. Identify the lines of symmetry in a 2-dimensional shape.	<b>Teacher's Edition:</b> 12b, 22b

## Concept 2: Transformation of Shapes

Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Demonstrate reflections using geometric figures.	<b>Teacher's Edition:</b> 78b, 116d, 117, 124
PO 2. Describe the transformations that created a tessellation.	<b>Teacher's Edition:</b> 88b, 93, 116d, 117, 122b, 124, 124b, 130b, 134, 137

## Concept 3: Coordinate Geometry

Specify and describe spatial relationships using coordinate geometry and other representational systems.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Graph points in the first quadrant on a grid using ordered pairs.	<b>Teacher's Edition:</b> 36b, 44b, 45, 49, 74, 86b, 88b

## Concept 4: Measurement-Units of Measure -Geometric Objects

Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. State an appropriate measure of accuracy for a contextual situation (e.g., What unit of measurement would you use to measure the top of your desk?).	<b>Teacher's Edition:</b> 14b, 66b, 72
PO 3. Determine relationships including volume (e.g., pints and quarts, milliliters and liters).	<b>Teacher's Edition:</b> 72d, 73, 80b, 102b, 103
PO 4. Convert measurement units to equivalent units within a given system (U.S. customary and metric) (e.g., 12 inches = 1 foot; 10 decimeters = 1 meter).	<b>Teacher's Edition:</b> 14b, 15, 58b, 100b, 113
PO 6. Determine the area of figures composed of two or more rectangles on a grid.	<b>Teacher's Edition:</b> 50d, 51, 59, 124b
PO 7. Solve problems involving the area of simple polygons.	<b>Teacher's Edition:</b> 50d, 51, 79, 88b, 89, 94d, 95, 109, 122b, 125, 130b, 132b

## Strand 5: Structure and Logic

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems in contextual situations.

Grade 5 Performance Objectives	Summer Success: Math, Grade 5
PO 1. Discriminate necessary information from unnecessary information in a given grade-level appropriate word problem.	<b>Teacher's Edition:</b> 8, 16, 46, 47-48, 58, 69-70, 91-92, 112, 118, 126, 134



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# Summer Success: Math © 2008 correlated to Arizona Mathematics Standard Articulated by Grade Level Grade 6

## Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

## Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Express fractions as ratios, comparing two whole numbers (e.g., $\frac{3}{4}$ is equivalent to 3:4 and 3 to 4).	<b>Teacher's Edition:</b> 20b, 30a, 31, 36a, 37, 40a, 41, 43, 46, 48a, 49, 54c, 60a, 61, 68b, 74
PO 2. Compare two proper fractions, improper fractions, or mixed numbers.	<b>Teacher's Edition:</b> 44b, 45, 49, 50, 62, 68b, 69, 72a, 114
PO 3. Order three or more proper fractions, improper fractions, or mixed numbers.	<b>Teacher's Edition:</b> 44b, 45, 49, 67-67a, 68b
PO 4. Determine the equivalency between and among fractions, decimals, and percents in contextual situations.	<b>Teacher's Edition:</b> 20b, 30c, 31, 40a, 41, 43, 43a, 46, 48a, 49, 54c, 60a, 61, 68b, 74
PO 5. Identify the greatest common factor for two whole numbers.	<b>Teacher's Edition:</b> 78c, 81-82, 88a, 89, 99-100, 102, 129-130
PO 6. Determine the least common multiple for two whole numbers.	<b>Teacher's Edition:</b> 23-24, 92b, 93, 96a, 97, 99-100, 104, 110, 122
PO 7. Express a whole number as a product of its prime factors, using exponents when appropriate.	<b>Teacher's Edition:</b> 78c, 79, 84a, 85, 86, 88a, 89, 91-91a, 92b, 93, 96a, 97

## Concept 2: Numerical Operations

Understand and apply numerical operations and their relationship to one another.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 23-24, 44, 44a, 51-52, 68-68a, 92-92a, 95-96, 99-100, 116-116a, 119-120
PO 2. Solve word problems using grade-level appropriate operations and numbers.	<b>Teacher's Edition:</b> 23-24, 44, 44a, 51-52, 68-68a, 92-92a, 95-96, 99-100, 116-116a, 119-120
PO 3. Apply grade-level appropriate properties to assist in computation.	<b>Teacher's Edition:</b> 6d, 12a, 13, 16a, 17, 22, 24a, 25, 64a, 78c, 79, 84a, 85, 88a, 89, 116b, 120a
PO 4. Apply the symbols for "...” or “___” to represent repeating decimals and “:” to represent ratios, superscripts as exponents.	<b>Teacher's Edition:</b> 126c-d, 127, 132a, 133, 136a-b, 137, 140b
PO 5. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6e, 12b, 16b, 20c, 24b, 30d, 36b, 40b, 44c, 48b, 54d, 60b, 64b, 68c, 72b, 78d, 84b, 88b, 92c, 96b, 102d, 108b, 112b, 116c, 126d, 132b, 136b
PO 6. Simplify fractions to lowest terms.	<b>Teacher's Edition:</b> 33-34, 41-42, 44-44a, 44b, 45, 47-48, 48a, 60a, 64a
PO 7. Add or subtract proper fractions and mixed numbers with unlike denominators with regrouping.	<b>Teacher's Edition:</b> 33-34, 40a, 41-42, 44, 44a, 44b, 45, 47-48, 48a, 64a, 65, 66, 97, 143-144
PO 8. Demonstrate the process of multiplication of proper fractions using models.	<b>Teacher's Edition:</b> 54c, 55, 57-58, 59-60, 63-64
PO 9. Multiply proper fractions.	<b>Teacher's Edition:</b> 21, 47-48, 54c, 55, 57-58, 59-60, 60a, 63-64, 64a, 65, 68-68a, 68b, 69, 71-72, 72a, 73, 143-144
PO 10. Multiply mixed numbers.	<b>Teacher's Edition:</b> 70, 71-72
PO 14. Solve problems involving fractions or decimals (including money) in contextual situations.	<b>Teacher's Edition:</b> 20, 20a, 27-28, 68-68a, 70, 71-72, 95-96

### Concept 3: Estimation

Use estimation strategies reasonably and fluently.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 3. Round to estimate quantities in contextual situations (e.g., round up or round down).	<b>Teacher's Edition:</b> 6d, 16a

### Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. **Communication, Problem-solving, Reasoning & Proof, Connections, and Representation** are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 11-12, 15-16, 35-36, 39-40, 75-76, 111-112, 116-116a, 131-132, 135-136
PO 2. Construct a histogram, line graph, scatter plot, or stem-and-leaf plot with appropriate labels and title from organized data.	<b>Teacher's Edition:</b> 11-12, 15-16, 35-36, 39-40, 63-64, 75-76, 107-108, 111-112, 116-116a, 131-132, 135-136
PO 3. Interpret simple displays of data including double bar graphs, tally charts, frequency tables, circle graphs, and line graphs.	<b>Teacher's Edition:</b> 35-36, 75-76, 107-108, 111-112, 116-116a, 131-132, 135-136
PO 4. Answer questions based on simple displays of data including double bar graphs, tally charts, frequency tables, circle graphs, and line graphs.	<b>Teacher's Edition:</b> 35-36, 39-40, 75-76, 107-108, 111-112, 131-132, 135-136
PO 5. Find the mean, median (odd number of data points), mode, range, and extreme values of a given numerical data set.	<b>Teacher's Edition:</b> 35-36, 131-132, 135-136
PO 6. Identify a trend (variable increasing, decreasing, remaining constant) from displayed data.	<b>Teacher's Edition:</b> 11-12, 15-16, 35-36, 39-40, 63-64, 75-76, 107-108, 131-132, 135-136
PO 7. Compare trends in data related to the same investigation.	<b>Teacher's Edition:</b> 111-112, 135-136

<b>Grade 6 Performance Objectives</b>	<b>Summer Success: Math, Grade 6</b>
PO 8. Solve contextual problems using bar graphs, tally charts, and frequency tables.	<b>Teacher's Edition:</b> 107-108, 111-112, 116-116a, 131-132, 135-136

### **Concept 2: Probability**

**Understand and apply the basic concepts of probability.**

<b>Grade 6 Performance Objectives</b>	<b>Summer Success: Math, Grade 6</b>
PO 1. Name the possible outcomes for a probability experiment.	<b>Teacher's Edition:</b> 83-84, 87-88
PO 3. Predict the outcome of a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 83-84, 87-88
PO 4. Record the data from performing a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 83-84, 87-88
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	<b>Teacher's Edition:</b> 87-88
PO 6. Make predictions from the results of student-generated experiments using objects (e.g., coins, spinners, number cubes, cards).	<b>Teacher's Edition:</b> 83-84, 87-88
PO 7. Compare the results of two repetitions of the same grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 87-88

### **Concept 3: Discrete Mathematics – Systematic Listing and Counting**

**Understand and demonstrate the systematic listing and counting of possible outcomes.**

<b>Grade 6 Performance Objectives</b>	<b>Summer Success: Math, Grade 6</b>
PO 1. Determine all possible outcomes involving a combination of three sets of three items, using a systematic approach (e.g., 3 different shirts, 3 different pairs of pants, and 3 different belts).	<b>Teacher's Edition:</b> 107-108
PO 2. Determine all possible arrangements given a set with four or fewer objects using a systematic list, table or tree diagram when order is not important.	<b>Teacher's Edition:</b> 107-108, 111-112

## Strand 3: Patterns, Algebra and Functions

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. **Communication, Problem-solving, Reasoning & Proof, Connections, and Representation** are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Communicate a grade-level appropriate recursive pattern, using symbols or numbers.	<b>Teacher's Edition:</b> 17, 20b, 21, 25, 30c, 36a, 40a, 44b, 45, 48a, 61, 69, 72a, 92b, 96a, 108a, 126c, 133
PO 2. Extend a grade-level appropriate iterative pattern.	<b>Teacher's Edition:</b> 20b, 21, 25, 30c, 31, 36a, 37, 40a, 41, 45, 48a, 49, 61, 65, 68b, 69, 72a, 73, 78c, 79, 85, 89, 92b, 96a, 97, 108a, 109, 112a, 126c, 127, 133
PO 3. Solve grade-level appropriate iterative pattern problems.	<b>Teacher's Edition:</b> 20b, 21, 25, 40a, 61, 68b, 69, 72a, 85, 92b, 96a, 108a, 126c, 133

### Concept 2: Functions and Relationships

Describe and model functions and their relationships.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).	<b>Teacher's Edition:</b> 120a, 140c, 142

### Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Evaluate expressions involving the four basic operations by substituting given fractions for the variable (e.g., $n+3$ , when $n = \_$ ).	<b>Teacher's Edition:</b> 20, 20a, 27-28, 47-48, 51-52, 89, 116b, 120a, 121
PO 2. Use variables in contextual situations.	<b>Teacher's Edition:</b> 20, 20a, 27-28, 36b, 47-48, 51-52, 89, 92b, 93, 116b, 120a, 121
PO 3. Translate a written phrase to an algebraic expression (e.g., The quotient of $m$ and 5 is $\frac{m}{5}$ or $m \div 5$ ).	<b>Teacher's Edition:</b> 20, 20a, 27-28, 51-52, 89, 116b, 120a, 121

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 4. Translate a phrase written in context into an algebraic expression (e.g., Write an expression to describe the situation: John has $x$ pieces of candy and buys three more. $x + 3$ ).	<b>Teacher's Edition:</b> 20, 20a, 27-28, 51-52, 89, 116b, 120a, 121
PO 5. Solve one-step equations with one variable represented by a letter or symbol, using inverse operations with whole numbers.	<b>Teacher's Edition:</b> 20, 20a, 27-28, 47-48, 48b, 51-52, 116b, 120a, 121

### Concept 4: Analysis of Change

Analyze change in a variable over time and in various contexts.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Identify values on a given line graph or scatter plot (e.g., Given a line showing wages earned per hour, what is the wage at five hours?).	<b>Teacher's Edition:</b> 116c

### Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. **Communication, Problem-solving, Reasoning & Proof, Connections, and Representation** are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Classify polygons by their attributes (e.g., number of sides, length of sides, angles, parallelism, perpendicularity).	<b>Teacher's Edition:</b> 6e, 7, 12b, 30d, 32, 36b, 46, 48b, 50, 54, 147-148
PO 2. Draw a geometric figure showing specified properties, such as parallelism and perpendicularity.	<b>Teacher's Edition:</b> 30d
PO 3. Classify prisms, pyramids, cones, and cylinders by base shape and lateral surface shape.	<b>Teacher's Edition:</b> 78d, 80, 84b, 86, 88b, 90
PO 6. Draw triangles with appropriate labels.	<b>Teacher's Edition:</b> 7, 14, 16b, 18
PO 7. Identify supplementary or complementary angles.	<b>Teacher's Edition:</b> 138

<b>Grade 6 Performance Objectives</b>	<b>Summer Success: Math, Grade 6</b>
PO 8. Identify the diameter, radius, and circumference of a circle or sphere.	<b>Teacher's Edition:</b> 54d, 56, 57-58, 59-60, 60b, 62, 64b, 66, 68c, 70, 72b, 94
PO 9. Draw a 2-dimensional shape with a given number of lines of symmetry.	<b>Teacher's Edition:</b> 20c, 24b, 26, 30, 36b, 40b, 44c

### **Concept 3: Coordinate Geometry**

**Specify and describe spatial relationships using coordinate geometry and other representational systems.**

<b>Grade 6 Performance Objectives</b>	<b>Summer Success: Math, Grade 6</b>
PO 1. Graph a polygon in the first quadrant using ordered pairs.	<b>Teacher's Edition:</b> 105-106, 108b, 110, 120b

### **Concept 4: Measurement-Units of Measure -Geometric Objects**

**Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.**

<b>Grade 6 Performance Objectives</b>	<b>Summer Success: Math, Grade 6</b>
PO 1. Determine the appropriate measure of accuracy within a system for a given contextual situation (e.g., Would you measure the length of your bedroom wall using inches or feet?).	<b>Teacher's Edition:</b> 120b
PO 5. Convert within a single measurement system (U.S. customary or metric) (e.g., How many ounces are equivalent to 2 pounds?).	<b>Teacher's Edition:</b> 6e, 16a, 49, 56, 65, 90, 102d, 108b, 116c, 118, 126d
PO 6. Solve problems involving the perimeter of polygons.	<b>Teacher's Edition:</b> 6e, 12b, 16b, 30d, 38, 40b, 42, 44c, 46, 48b
PO 7. Determine the area of triangles.	<b>Teacher's Edition:</b> 12b, 20c, 21, 24b
PO 9. Solve problems for the areas of parallelograms (includes rectangles).	<b>Teacher's Edition:</b> 36b, 38, 44c, 68c, 121
PO 11. Determine the actual measure of objects using a scale drawing or map.	<b>Teacher's Edition:</b> 140c

## Strand 5: Structure and Logic

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems in contextual situations.

Grade 6 Performance Objectives	Summer Success: Math, Grade 6
PO 1. Discriminate necessary information from unnecessary information in a given grade-level appropriate word problem.	<b>Teacher's Edition:</b> 23-24, 44, 44a, 51-52, 68-68a, 92-92a, 95-96, 99-100, 116-116a, 119-120



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correlated to  
**Arizona Mathematics Standard Articulated by Grade Level**  
**Grade 7**

**Strand 1: Number Sense and Operations**

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

**Concept 1: Number Sense**

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

<b>Grade 7 Performance Objectives</b>	<b>Summer Success: Math, Grade 7</b>
PO 1. Express fractions as terminating or repeating decimals.	<b>Teacher's Edition:</b> 16a-b, 24a-b, 30c, 31, 36a, 37, 48a, 49
PO 2. Identify the greatest common factor for a set of whole numbers.	<b>Teacher's Edition:</b> 78c, 79, 80, 81-82, 84a, 85-86, 97, 115a
PO 3. Determine the least common multiple for a set of whole numbers.	<b>Teacher's Edition:</b> 75-76, 78c, 84b, 96a, 97, 115a
PO 6. Locate integers on a number line.	<b>Teacher's Edition:</b> 54c, 57-58, 61, 64a, 68b, 72a, 73
PO 7. Order integers.	<b>Teacher's Edition:</b> 60a, 61, 64a, 68b, 72a, 73
PO 8. Classify rational numbers as natural, whole, or integers.	<b>Teacher's Edition:</b> 54c

## Concept 2: Numerical Operations

Understand and apply numerical operations and their relationship to one another.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Add integers.	<b>Teacher's Edition:</b> 54c, 55, 60a, 64a, 66, 68-68a, 69, 71-72, 73, 75-76, 95-96, 113, 120a, 139-139a, 147-148
PO 2. Subtract integers.	<b>Teacher's Edition:</b> 60a, 64a, 65, 66, 68-68a, 69, 71-72, 73, 75-76, 95-96, 113, 139-139a
PO 3. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 32
PO 4. Solve word problems using grade-level appropriate operations and numbers.	<b>Teacher's Edition:</b> 32
PO 5. Multiply integers.	<b>Teacher's Edition:</b> 68b, 69, 71-72, 72a, 73, 75-76, 91-91a, 92-92a, 95-96, 96a, 139-139a, 147-148
PO 6. Divide integers.	<b>Teacher's Edition:</b> 75-76, 128, 146
PO 7. Apply grade-level appropriate properties to assist in computation.	<b>Teacher's Edition:</b> 136a
PO 9. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6e, 12b, 16b, 20c, 30d, 36b, 40b, 44c, 48b, 54d, 60b, 64b, 68c, 72b, 78, 78d, 84b, 88b, 92c, 102d, 107b, 112b, 116b, 126d, 132b, 140c
PO 10. Calculate the percent of a given number.	<b>Teacher's Edition:</b> 6d, 7, 12a, 14, 16a, 24a, 26, 43-44, 49, 62, 66, 104
PO 11. Convert numbers expressed in standard notation to scientific notation and vice versa (positive exponents only).	<b>Teacher's Edition:</b> 88a, 90, 91-91a, 92b, 93, 94, 114, 132a, 133, 136a, 137, 140b, 141
PO 12. Simplify numerical expressions using the order of operations with grade- appropriate operations on number sets.	<b>Teacher's Edition:</b> 132a-b

## Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 11-12
PO 2. Construct a circle graph with appropriate labels and title from organized data.	<b>Teacher's Edition:</b> 59-60
PO 3. Determine when it is appropriate to use histograms, line graphs, double bar graphs, and stem-and-leaf plots.	<b>Teacher's Edition:</b> 11-12, 15-16, 39-40, 63-64, 83-84, 87-88
PO 4. Interpret data displays including histograms, stem-and-leaf plots, circle graphs, and double line graphs.	<b>Teacher's Edition:</b> 11-12, 15-16, 35-36, 39-40, 59-60, 63-64, 83-84, 87-88
PO 5. Answer questions based on data displays including histograms, stem-and-leaf plots, circle graphs, and double line graphs.	<b>Teacher's Edition:</b> 11-12, 15-16, 35-36, 39-40, 59-60, 63-64, 83-84, 87-88
PO 6. Find the mean, median, mode, and range of a given numerical data set.	<b>Teacher's Edition:</b> 11-12
PO 7. Interpret trends from displayed data.	<b>Teacher's Edition:</b> 15-16, 107-108
PO 8. Compare trends in data related to the same investigation.	<b>Teacher's Edition:</b> 39-40
PO 9. Solve contextual problems using histograms, line graphs of continuous data, double bar graphs, and stem-and-leaf plots.	<b>Teacher's Edition:</b> 11-12, 15-16, 35-36, 39-40, 83-84, 87-88

## Concept 2: Probability

Understand and apply the basic concepts of probability.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Determine the probability that a specific event will occur in a single stage probability experiment (e.g., Find the probability of drawing a red marble from a bag with 3 red, 5 blue, and 9 black marbles.).	<b>Teacher's Edition:</b> 131-132, 135-136, 150
PO 2. Compare probabilities to determine the fairness of a contextual situation (e.g. If John wins when two or greater shows after a six-sided number cube is rolled and Joaquin wins otherwise, is this a fair game?).	<b>Teacher's Edition:</b> 135-136
PO 3. Predict the outcome of a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 131-132, 135-136
PO 4. Record the data from performing a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 131-132, 135-136
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	<b>Teacher's Edition:</b> 135-136
PO 6. Make predictions from the results of student-generated experiments using objects (e.g., coins, spinners, number cubes, cards).	<b>Teacher's Edition:</b> 131-132, 135-136
PO 7. Compare the results of two repetitions of the same grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 135-136

## Strand 3: Patterns, Algebra and Functions

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Communicate a grade-level appropriate recursive pattern, using symbols or numbers.	<b>Teacher's Edition:</b> 6d, 12a, 13, 17, 20b, 21, 25, 30c, 31, 36a, 40a, 44b, 45, 48a, 49, 60a, 72a, 79, 84a, 85, 88a, 96a
PO 2. Extend a grade-level appropriate recursive pattern.	<b>Teacher's Edition:</b> 6d, 12a, 13, 17, 20b, 21, 25, 30c, 31, 36a, 40a, 44b, 45, 48a, 49, 60a, 72a, 79, 84a, 85, 88a, 96a
PO 3. Solve grade-level appropriate recursive pattern problems.	<b>Teacher's Edition:</b> 6d, 12a, 13, 17, 20b, 21, 25, 30c, 31, 36a, 40a, 44b, 45, 48a, 49, 60a, 72a, 79, 84a, 85, 88a, 96a

### Concept 2: Functions and Relationships

Describe and model functions and their relationships.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).	<b>Teacher's Edition:</b> 73, 78c, 93, 94, 98, 102c, 107a, 114, 117, 120a, 121

### Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Evaluate an expression containing two variables by substituting integers for the variable (e.g., $7x + m$ , when $x = -4$ and $m = 12$ ).	<b>Teacher's Edition:</b> 27-28, 44-44a, 68-68a, 71-72, 99-100, 102c, 108a, 109, 112a, 113, 116-116a-b, 117, 126c, 127, 132a, 133, 137, 139-139a, 140-140a
PO 2. Use variables in contextual situations.	<b>Teacher's Edition:</b> 27-28, 44-44a, 68-68a, 71-72, 99-100, 102c, 103-104, 108a, 109, 112a, 113, 116-116a-b, 117, 126c, 127, 132a, 133, 137, 139-139a, 140-140a
PO 3. Translate a written sentence into a one-step, one-variable algebraic equation.	<b>Teacher's Edition:</b> 27-28, 44-44a, 68-68a, 71-72, 99-100, 102c, 108a, 109, 112a, 113, 116-116a, 117, 126c, 127, 132a, 133, 137, 139-139a, 140-140a

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 4. Translate a sentence written in context into an algebraic equation involving one operation.	<b>Teacher's Edition:</b> 27-28, 44-44a, 68-68a, 71-72, 99-100, 102c, 108a, 109, 112a, 113, 116-116a-b, 117, 126c, 127, 132a, 133, 137, 139-139a, 140-140a
PO 5. Solve one-step equations using inverse operations with positive rational numbers (e.g., $\frac{2}{3}n = 6$ ).	<b>Teacher's Edition:</b> 123-124, 127

### Concept 4: Analysis of Change

Analyze change in a variable over time and in various contexts.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Analyze change in various linear contextual situations.	<b>Teacher's Edition:</b> 120a, 121, 145

### Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. **Communication, Problem-solving, Reasoning & Proof, Connections, and Representation** are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Draw a geometric figure showing specified properties (e.g., Draw an obtuse triangle.).	<b>Teacher's Edition:</b> 6e, 7, 146
PO 2. Classify 3-dimensional solids by their configuration and properties (e.g., parallelism, perpendicularity and congruency).	<b>Teacher's Edition:</b> 102d, 126d, 144b
PO 3. Identify the net (2-dimensional representation) that corresponds to a rectangular prism, cone, or cylinder.	<b>Teacher's Edition:</b> 129-130
PO 4. Distinguish between length, area, and volume, using 2- and 3-dimensional geometric figures.	<b>Teacher's Edition:</b> 13, 20-21
PO 5. Draw polygons with appropriate labels.	<b>Teacher's Edition:</b> 6d

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 7. Recognize the relationship between central angles and intercepted arcs.	<b>Teacher's Edition:</b> 136b, 137
PO 8. Identify arcs and chords of a circle.	<b>Teacher's Edition:</b> 93, 136b, 137
PO 10. Identify corresponding parts of congruent polygons as congruent.	<b>Teacher's Edition:</b> 12b

## Concept 2: Transformation of Shapes

**Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.**

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Identify rotations about a point, using pictorial models.	<b>Teacher's Edition:</b> 68c
PO 2. Recognize simple single rotations, translations or reflections on a coordinate grid.	<b>Teacher's Edition:</b> 54d, 68c, 78d, 84b, 96b, 97, 103

## Concept 3: Coordinate Geometry

**Specify and describe spatial relationships using coordinate geometry and other representational systems.**

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Graph data points in (x, y) form in any quadrant of a coordinate grid.	<b>Teacher's Edition:</b> 54d, 56, 57-58, 62, 64b, 66, 67-67a, 70, 72b, 74, 79, 84b, 85, 102c, 107a, 109, 112a, 113, 116b, 117, 134, 140-140a, 143-144

## Concept 4: Measurement-Units of Measure -Geometric Objects

**Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.**

Grade 7 Performance Objectives	Summer Success: Math, Grade 7
PO 1. Identify the appropriate unit of measure for the volume of an object (e.g., cubic inches or cubic cm).	<b>Teacher's Edition:</b> 44c, 116c, 118, 120b, 123-124, 126d, 132b, 134
PO 3. Convert a measurement from U.S. customary to metric, and vice versa.	<b>Teacher's Edition:</b> 24b, 44c
PO 4. Solve problems involving the circumference of a circle.	<b>Teacher's Edition:</b> 88b, 89, 92c, 136b, 140c

<b>Grade 7 Performance Objectives</b>	<b>Summer Success: Math, Grade 7</b>
PO 5. Solve problems involving the area of a circle.	<b>Teacher's Edition:</b> 88b, 92c, 136b, 140c, 142
PO 6. Solve problems for the areas of parallelograms, triangles, and circles.	<b>Teacher's Edition:</b> 60b, 64b, 68c, 72b, 78d, 96b, 102d, 105-106, 143-144, 144b
PO 7. Identify polygons having the same perimeter or area.	<b>Teacher's Edition:</b> 46, 47-48, 51-52
PO 8. Compare estimated to actual lengths based on scale drawings or maps.	<b>Teacher's Edition:</b> 12b, 20c

### Strand 5: Structure and Logic

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. **Communication, Problem-solving, Reasoning & Proof, Connections, and Representation** are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems in contextual situations.

<b>Grade 7 Performance Objectives</b>	<b>Summer Success: Math, Grade 7</b>
PO 1. Discriminate necessary information from unnecessary information in a given grade-level appropriate word problem.	<b>Teacher's Edition:</b> 32



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## Strand 1: Number Sense and Operations

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Locate rational numbers on a number line.	<b>Teacher's Edition:</b> 6d-e, 25, 54c, 68b, 69, 72a, 73, 78, 115, 136a, 140b, 141
PO 2. Identify irrational numbers.	<b>Teacher's Edition:</b> 84a

### Concept 2: Numerical Operations

Understand and apply numerical operations and their relationship to one another.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Select the grade-level appropriate operation to solve word problems.	<b>Teacher's Edition:</b> 17, 21, 32-42, 56, 66, 93, 114, 141, 146
PO 2. Solve word problems using grade-level appropriate operations and numbers.	<b>Teacher's Edition:</b> 17-21, 32, 42, 56, 66, 93, 114, 141, 146
PO 3. Determine the square of an integer.	<b>Teacher's Edition:</b> 30c, 31, 44-44a, 79-80, 86, 132a, 141
PO 4. Determine the square root of an integer.	<b>Teacher's Edition:</b> 78c, 79-80, 84a, 85, 94

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 5. Identify squaring and finding square roots as inverse operations.	<b>Teacher's Edition:</b> 79-80
PO 6. Apply grade-level appropriate properties to assist in computation.	<b>Teacher's Edition:</b> 88a, 89, 140b
PO 7. Apply the symbols " $\sqrt{\quad}$ " to represent square root, " $\pm$ " to represent roots, and " $\{\}$ " as grouping symbols.	<b>Teacher's Edition:</b> 31, 44b, 84a, 85, 97
PO 8. Use grade-level appropriate mathematical terminology.	<b>Teacher's Edition:</b> 6e, 12b, 16b, 20c, 30d, 36b, 40b, 44c, 54d, 60b, 64b, 68c, 78d, 84b, 88b, 92c, 102d, 108b, 112b, 116c, 126d, 132b, 136b, 140c
PO 9. Calculate the missing value in a percentage problem.	<b>Teacher's Edition:</b> 6d, 7, 12a, 13, 17, 21, 50
PO 10. Convert standard notation to scientific notation, and vice versa.	<b>Teacher's Edition:</b> 46, 88a, 89, 92b, 93, 110
PO 11. Simplify numerical expressions using the order of operations with grade- appropriate operations on number sets.	<b>Teacher's Edition:</b> 92b

### Concept 3: Estimation

Use estimation strategies reasonably and fluently.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Solve grade-level appropriate problems using estimation.	<b>Teacher's Edition:</b> 25

### Strand 2: Data Analysis, Probability, and Discrete Mathematics

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Data Analysis (Statistics)

Understand and apply data collection, organization and representation to analyze and sort data.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Formulate questions to collect data in contextual situations.	<b>Teacher's Edition:</b> 59-60, 63-64, 87-88, 107-108

<b>Grade 8 Performance Objectives</b>	<b>Summer Success: Math, Grade 8</b>
PO 2. Construct box-and-whisker plots.	<b>Teacher's Edition:</b> 59-60, 63-64
PO 3. Determine the appropriate type of graphical display for a given data set.	<b>Teacher's Edition:</b> 87-88
PO 4. Interpret box-and-whisker plots, circle graphs, and scatter plots.	<b>Teacher's Edition:</b> 39-40, 59-60, 63-64, 83-84, 107-108
PO 5. Answer questions based on box-and-whisker plots, circle graphs, and scatter plots.	<b>Teacher's Edition:</b> 39-40, 59-60, 63-64, 83-84, 107-108
PO 6. Solve problems in contextual situations using the mean, median, mode, and range of a given data set.	<b>Teacher's Edition:</b> 11-12, 15-16, 59-60, 63-64, 87-88
PO 7. Formulate reasonable predictions based on a given set of data.	<b>Teacher's Edition:</b> 107-108
PO 8. Compare trends in data related to the same investigation.	<b>Teacher's Edition:</b> 63-64, 107-108
PO 9. Solve contextual problems using scatter plots, box-and-whiskers plots, and double line graphs of continuous data.	<b>Teacher's Edition:</b> 11-12, 59-60, 63-64, 83-84, 107-108
PO 11. Identify a line of best fit for a scatter plot.	<b>Teacher's Edition:</b> 87-88, 107-108, 111-112
PO 12. Distinguish between causation and correlation.	<b>Teacher's Edition:</b> 107-108, 111-112

## **Concept 2: Probability**

**Understand and apply the basic concepts of probability.**

<b>Grade 8 Performance Objectives</b>	<b>Summer Success: Math, Grade 8</b>
PO 1. Determine the probability that a specific event will occur in a 2-stage probability experiment.	<b>Teacher's Edition:</b> 129-130, 131-132, 135-136
PO 2. Solve contextual situations using probability (e.g., If the probability of Michelle making a free throw is 0.25, what is the probability that she will make three free throws in a row?).	<b>Teacher's Edition:</b> 129-130, 131-132
PO 3. Predict the outcome of a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 129-130, 131-132, 135-136

<b>Grade 8 Performance Objectives</b>	<b>Summer Success: Math, Grade 8</b>
PO 4. Record the data from performing a grade-level appropriate probability experiment.	<b>Teacher's Edition:</b> 129-130, 131-132
PO 6. Distinguish between independent and dependent events.	<b>Teacher's Edition:</b> 131-132, 135-136

### Strand 3: Patterns, Algebra and Functions

**Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.**

#### Concept 1: Patterns

**Identify patterns and apply pattern recognition to reason mathematically.**

<b>Grade 8 Performance Objectives</b>	<b>Summer Success: Math, Grade 8</b>
PO 1. Communicate a grade-level appropriate iterative or recursive pattern, using symbols or numbers.	<b>Teacher's Edition:</b> 6d, 7, 13, 17, 21, 24a, 25, 31, 37, 44-45, 44b, 54c, 69, 72a, 79, 103, 132a, 133
PO 2. Extend a grade-level appropriate iterative or recursive pattern.	<b>Teacher's Edition:</b> 6d, 7, 13, 17, 21, 24a, 25, 31, 37, 44-44a, 44b, 54c, 69, 72a, 79, 103, 132a, 133
PO 3. Solve grade-level appropriate iterative or recursive pattern problems.	<b>Teacher's Edition:</b> 6d, 7, 13, 17, 21, 24a, 25, 31, 37, 44-44a, 44b, 47-48, 48a, 54c, 61, 69, 72a, 79, 96a, 103, 132a, 133

#### Concept 2: Functions and Relationships

**Describe and model functions and their relationships.**

<b>Grade 8 Performance Objectives</b>	<b>Summer Success: Math, Grade 8</b>
PO 1. Describe the rule used in a simple grade-level appropriate function (e.g., T-chart, input/output model).	<b>Teacher's Edition:</b> 20b, 36a, 38, 102c, 103, 108a, 109, 113, 116b, 117, 128, 133, 136a, 138, 139-139a, 144a, 145
PO 2. Distinguish between linear and nonlinear functions, given graphic examples.	<b>Teacher's Edition:</b> 116b, 117, 120a, 121, 128

### Concept 3: Algebraic Representations

**Represent and analyze mathematical situations and structures using algebraic representations.**

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Evaluate algebraic expressions by substituting rational values for variables [e.g., $2(ab+ac+bc)$ , when $a = 2$ , $b = 3/5$ , and $c = 4$ ].	<b>Teacher's Edition:</b> 20b, 21, 44-44a, 48a, 49, 65-66, 69, 73, 89, 92-92a, 93, 97, 98, 99-100, 104, 112a, 113, 116-116a, 119-120, 123-124, 140b, 141-142, 143-144
PO 2. Use variables in contextual situations.	<b>Teacher's Edition:</b> 20b, 44-44a, 48a, 49, 65-66, 69, 73, 89, 92-92a, 93, 97, 98, 99-100, 104, 112a, 113, 116-116a, 119-120, 123-124, 140b, 141-142, 142-144
PO 3. Translate a written sentence or phrase into an algebraic equation or expression, and vice versa (e.g., Three less than twice a number is $2n-3$ ).	<b>Teacher's Edition:</b> 92-92a, 93, 97, 104, 112a, 113, 116-116a, 119-120, 123-124, 140b, 141-142, 143-144
PO 4. Translate a sentence written in context into an algebraic equation involving two operations.	<b>Teacher's Edition:</b> 123-124, 140b, 141-142, 143-144
PO 5. Translate a contextual situation into an algebraic inequality (e.g., Joe earns more than \$5.00 an hour; therefore, $x > 5$ ).	<b>Teacher's Edition:</b> 126c, 126d, 127
PO 6. Identify an equation or inequality that represents a contextual situation.	<b>Teacher's Edition:</b> 92-92a, 97, 104, 116-116a, 119-120, 123-124, 126c, 140b, 141-142, 143-144
PO 7. Solve one-step equations with rational numbers as coefficients or as solutions.	<b>Teacher's Edition:</b> 4320b, 48a, 49, 65-66, 73, 89, 92-92a, 93, 97, 98, 99-100, 104, 112a, 113, 116-116a, 119-120, 123-124, 140b, 141-142, 143-144
PO 8. Solve one-step equations that model contextual situations.	<b>Teacher's Edition:</b> 4320b, 48a, 49, 65-66, 73, 89, 92-92a, 93, 97, 98, 99-100, 104, 112a, 113, 116-116a, 119-120, 123-124, 140b, 141-142, 143-144
PO 9. Solve two-step equations with rational coefficients and integer solutions (e.g., $3x + 5 = 11$ , $4x - 20 = 8$ ).	<b>Teacher's Edition:</b> 108a-b, 119-120
PO 10. Graph an inequality on a number line.	<b>Teacher's Edition:</b> 126c, 127
PO 11. Solve a simple algebraic proportion.	<b>Teacher's Edition:</b> 114, 140-140a, 140b, 141-142, 146
PO 12. Solve applied problems using the Pythagorean theorem.	<b>Teacher's Edition:</b> 78d, 96a

## Concept 4: Analysis of Change

Analyze change in a variable over time and in various contexts.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Identify the slope of a line as the rate of change (the ratio of rise over run).	<b>Teacher's Edition:</b> 137-138, 139-139a, 140-140a

## Strand 4: Geometry and Measurement

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

## Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional shapes and develop mathematical arguments about their relationships.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 6. Identify the properties of angles created by a transversal intersecting two parallel lines (e.g., corresponding angles are congruent).	<b>Teacher's Edition:</b> 92c, 94
PO 7. Recognize the relationship between inscribed angles and intercepted arcs.	<b>Teacher's Edition:</b> 102d, 104, 126d
PO 9. Determine whether three given lengths can form a triangle.	<b>Teacher's Edition:</b> 33-34

## Concept 2: Transformation of Shapes

Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Identify the planar geometric figure that is the result of a given rigid transformation.	<b>Teacher's Edition:</b> 68c
PO 2. Model a simple transformation on a coordinate grid (e.g., Translate right four units and down two units.).	<b>Teacher's Edition:</b> 60b, 68c, 72b, 74

### Concept 3: Coordinate Geometry

Specify and describe spatial relationships using coordinate geometry and other representational systems.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Use a table of values to graph a linear equation.	<b>Teacher's Edition:</b> 12a, 33-34, 40a, 54d, 56, 57-58, 60b, 61, 64b, 66, 68c, 70, 72b, 74, 84b, 96b, 97, 103, 109, 126c, 128, 132a, 136a

### Concept 4: Measurement-Units of Measure -Geometric Objects

Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Solve problems for the area of a trapezoid.	<b>Teacher's Edition:</b> 60b, 64b, 66
PO 2. Solve problems involving the volume of rectangular prisms and cylinders.	<b>Teacher's Edition:</b> 108b, 109, 112b, 114, 116c, 118, 120b, 122, 132b, 134
PO 3. Calculate the surface area of rectangular prisms or cylinders.	<b>Teacher's Edition:</b> 108b, 109, 112b, 114, 116c, 118, 120b, 122, 132b, 134
PO 5. Find the measure of a missing interior angle in a triangle or quadrilateral.	<b>Teacher's Edition:</b> 12b, 14, 16b, 18, 20c, 24b, 26, 30d
PO 6. Solve problems using ratios and proportions, given the scale factor.	<b>Teacher's Edition:</b> 16a, 20-20a, 20b, 23-24, 27-28, 68c
PO 7. Calculate the length of a side, given two similar triangles.	<b>Teacher's Edition:</b> 6e, 40b, 44c, 45, 48b, 50, 84b, 86, 96b, 136b, 138

## Strand 5: Structure and Logic

Every student should understand and use all concepts and skills from the previous grade levels. The standards are designed so that new learning builds on preceding skills and are needed to learn new skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of mathematical strands.

### Concept 1: Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems in contextual situations.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 1. Describe how to use a proportion to solve a problem in context.	<b>Teacher's Edition:</b> 16a-b, 20c, 23, 24b, 55-56, 84b, 86, 114, 140-140a, 140b, 141-142, 146

### Concept 2: Logic, Reasoning, Arguments, And Mathematical Proof

Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions and recognize their applications.

Grade 8 Performance Objectives	Summer Success: Math, Grade 8
PO 4. Verify the Pythagorean theorem using an area dissection argument.	<b>Teacher's Edition:</b> 78d, 96a



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