# Oklahoma Academic Standards

# At-A-Glance
## PreK - Algebra 2

***This document DOES NOT represent the entire scope of this grade and IS NOT meant to replace the original standards document.***

This **At-A-Glance** guide is designed to support teachers, team leaders, department chairs, curriculum directors, and administrators as they select, recommend, pilot, adopt, or revise instructional materials aligned to the new Oklahoma Academic Standards for Mathematics.

The listed concepts are not meant to serve as a summary of the entire standards document. Instead, they are meant to succinctly identify **new and changed concepts at each grade level**. Standards and objectives that are not listed are done so intentionally as they were deemed to be more similar than not to existing grade-level PASS objectives.

- Please visit https://goo.gl/Tmk79j to add your comments to the **community version** of this document.
- Download the **Oklahoma Academic Standards for Mathematics** at http://sde.ok.gov/sde/oklahoma-academic-standards.
- Find the **Crosswalk documents** developed by the Central and Northeastern Consortia at https://goo.gl/gblx65.

OKLAHOMA STATE DEPARTMENT OF EDUCATION
CHAMPION EXCELLENCE

# Pre-Kindergarten At-A-Glance

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| New Grade Level Concepts | Changed Concepts | Critical Gaps |
|---|---|---|
| *New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS | *Changed Concepts* are those that are related to grade-level PASS standards with changes underlined | *Critical Gaps* must be taught to ensure students do not skip these concepts. |
| **Number & Operations**<br>● Recognize written numerals and quantities (**PK.N.1.2-3**)<br>● Correlation with counting and quantity (**PK.N.2.3-4**)<br>● Comparing sets of objects (**PK.N.3.1**)<br>**Data & Probability**<br>● Creating real world graphs (**PK.D.1.2**) | **Number & Operations**<br>● Count aloud forward in sequence by 1s to 20 (**PK.N.1.1)**<br>● Identify the number of objects in a row or column (**PK.N.2.1**)<br>**Algebraic Reasoning & Algebra**<br>● Recognize, duplicate, and extend repeating patterns (**PK.A.1.2**)<br>**Geometry & Measurement**<br>● Identify circles, squares, rectangles, and triangles (**PK.GM.1.1**) | None have been identified. |

Key:
(Oklahoma Academic Standard for Mathematics)
(Oklahoma Academic Standard for Mathematics // Corresponding PASS Objective)

# Kindergarten At-A-Glance

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| New Grade Level Concepts | Changed Concepts | Critical Gaps |
|---|---|---|
| *New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS | *Changed Concepts* are those that are related to grade-level PASS standards with changes underlined | *Critical Gaps* must be taught to ensure students do not skip these concepts. |
| **Number & Operations**<br>● Subitizing quantities up to 10 (**K.N.1.4**)<br>● Find 1 more or less than a number (**K.N.1.7**)<br>● Equally distribute objects into at least 2 groups (**K.N.3.1**)<br>**Geometry & Measurement**<br>● Use basic shapes to compose shapes (**K.GM.1.4-5**) and represent real-world objects (**K.GM.1.6**)<br>● Explore volume through filling 2 different containers (**K.GM.2.4**)<br>● Tell time related to the real world (**K.GM.3.1**)<br>**Data & Probability**<br>● Draw conclusions from graphs (**K.D.1.3**) | **Number & Operations**<br>● Count aloud forward in sequence to 100 by 1's and 10's (**K.N.1.1 // see PASS K.2.3**)<br>● Recognize that a number can be used to represent how many objects are in a set (**K.N.1.2 // see PASS K.2.5**)<br>● Count forward, with and without objects, from any given number (**K.N.1.5 // see PASS K.2.3**)<br>● Discuss and represent whole numbers from 0 to at least 10 (**K.N.1.6 // see PASS K.2.6**)<br>**Algebraic Reasoning & Algebra**<br>● Sort and group up to 10 objects into a set (**K.A.1.1 // see PASS K.1.1**)<br>● Recognize, duplicate, complete, and extend repeating, shrinking and growing patterns (**K.A.1.2 // see PASS K.1.2**)<br>**Geometry & Measurement**<br>● Sort two-dimensional objects using characteristics such as shape, size, color, and thickness (**K.GM.1.2 // see PASS K.1.1**)<br>● Identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably **(K.GM.1.3 // see PASS K.3.1**)<br>● Compare objects according to length, size, weight, position, and location (**K.GM.2.1 // see PASS K.3.3 and K.4.1.b**)<br>● Order up to 6 objects using measurable attributes (**K.GM.2.2 // see PASS K.4.1.c**) | None have been identified. |

Key:
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# 1st Grade At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Number & Operations**

- Subitizing quantities up to 20 (**1.N.1.1**)
- Find 10 more or less than a number (**1.N.1.5**)
- Locate numbers on open number line (**1.N.1.7**)
- Determine if equations are true or false (**1.N.2.2**)
- Partition polygons and objects equally (**1.N.3.1-2**)
- Use cent symbol to describe value of coins **(1.N.4.2-3**)

**Geometry & Measurement**

- Compose with three-dimensional shapes (**1.GM.1.3**)
- Understand measurement through illustrations and multiple measurement methods (**1.GM.2.1-3**)
- Identify volume with tools (**1.GM.2.5**)

**Data & Probability**

- Use data to create graphs (**1.D.2**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Use concrete representations to describe numbers between 10 and 100 (**1.N.1.2 // see PASS 1.2.1.a**)
- Read, write, discuss, and represent whole numbers up to 100 (**1.N.1.3 // see PASS 1.2.1.c**)
- Count forward, with and without objects, from any given number up to 100 (**1.N.1.4 // see PASS 1.1.3**)
- Compare and order whole numbers from 0 to 100 (**1.N.1.6 // see PASS 1.2.1.c**)
- Represent and solve real-world and mathematical problems using addition and subtraction up to ten (**1.N.2.1 // see PASS 1.2.2.a.1)**

**Algebraic Reasoning & Algebra**

- Identify, create, complete, and extend repeating, growing, and shrinking patterns with quantity, numbers, or shapes in a variety of real-world and mathematical contexts (**1.A.1.1 // see PASS 1.1.1 and 1.1.2**)

**Geometry & Measurement**

- Identify trapezoids and hexagons (**1.GM.1.1 // see PASS 1.3.2**)
- Describe a length to the nearest whole unit using a number and a unit (**1.GM.2.4 // see PASS 1.4.1**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Geometry & Measurement**

- Use smaller shapes to form a larger shape when there is an outline to follow (**K.GM.1.4 // see PASS 2.3.2**)

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# 2nd Grade At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Number & Operations**
- Locate numbers on an open number line (**2.N.1.2**)
- Find 10 more or less and 100 more or less (**2.N.1.4**)
- Rounding numbers to the nearest 10 and 100 (**2.N.1.5**)
- Solve real-world addition and subtraction problems (**2.N.2.5**)
- Construct fractions (**2.N.3.2**)

**Algebraic Reasoning & Algebra**
- Use number sentences involving unknowns (**2.A.2.1-2**)
- Commutative and identity properties (**2.A.2.3**)

**Geometry & Reasoning**
- Relationships within measurement (**2.GM.2.1**)

**Data & Probability**
- Analyzing graph creation (**2.D.1.1**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**
- Use place value to describe whole numbers between 10 and 1,000 in terms of hundreds, tens, and ones. Know that 100 is 10 tens , and 1,000 is 10 hundreds (**2.N.1.3 // see PASS 2.2.1a**)
- Use the relationships between addition and subtraction to generate basic facts up to 20 (**2.N.2.1 // see PASS 2.2.a**)
- Demonstrate fluency with basic addition facts and related subtraction facts up to 20 (**2.N.2.2 // see PASS 2.2.a**)

**Geometry & Measurement**
- Compose two-dimensional shapes using triangles, squares, hexagons, trapezoids, and rhombi (**2.GM.1.3 // see PASS 2.3.2**)
- Explain the relationship between length and the numbers on a ruler by using a ruler to measure lengths to the nearest whole inch (**2.GM.2.2 // see PASS 2.4.1.a**)
- Read and write time to the quarter-hour on an analog and digital clock. Distinguish between a.m. and p.m. (**2.GM.3.1 // see PASS 2.4.2.a**)

**Data & Probability**
- Organize a collection of data with up to four categories using pictographs and bar graphs with intervals of 1s, 2s, 5s, 10s (**2.D.1.2 // see PASS 2.5.1a**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Geometry & Measurement**
- Compose and decompose larger shapes using smaller two-dimensional shapes (**1.GM.1.2 // see PASS 2.3.2**)
- Use smaller shapes to form a larger shape when there is an outline to follow (**K.GM.1.4 // see PASS 2.3.2**)

**Data & Probability**
- Collect, sort, and organize data in up to three categories using representations (**1.D.1.1 // see PASS 2.5.1.a**)
- Draw conclusions from picture and bar-type graphs (**1.D.1.3 // see PASS 2.5.1.b**)

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# 3rd Grade At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Number & Operations**

- Find 1,000 more or less and 100 more or 100 less than a number (**3.N.1.3**)
- Rounding numbers (**3.N.2.4**)
- Represent division using various approaches (**3.N.2.6**)
- Solve real-world problems with multiplication and division (**3.N.2.7**)
- Compose and decompose fractions (**3.N.3.3**)
- Coin combinations for a dollar (**3.N.4.2**)

**Algebraic Reasoning & Algebra**

- Growing geometric patterns (**3.A.1.3**)
- Properties of addition (**3.A.2.2**)
- Associative property of multiplication (**3.A.2.2**)

**Geometry & Reasoning**

- Building three-dimensional shape**s (3.GM.1.2)**
- Classify angles (**3.GM.1.3**)
- Area formula (**3.GM.2.2, 8**)
- Use cubes to explore volume (**3.GM.2.7**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Represent whole numbers up to 10,000 (**3.N.1.1 // see PASS 3.2.1.a.i and 3.2.1.a.ii**)
- Describe whole numbers between 1,000 and 10,000 (**3.N.1.2 // see PASS 3.2.1.a.ii**)
- Compare and order whole numbers up to 10,000 (**3.N.1.4 // see PASS 3.2.1.b.i**)
- Represent multiplication facts in a variety of approaches (**3.N.2.1 // see PASS 2.2.2.d and 3.2.2.b.i**)
- Construct fractions using length, set, and area models (**3.N.3.2 // see PASS 3.2.1.b.ii**)

**Algebraic Reasoning & Algebra**

- Solve one-step open sentences. Generate real-world situations to represent number sentences (**3.A.2.1 // see PASS 3.1.2**)
- Use number properties (commutative, identity, and associative properties of addition and multiplication) (**3.A.2.2 // see PASS 3.1.3**)

**Geometry & Reasoning**

- Measure to the nearest whole yard, whole foot, or half inch (**3.GM.2.4 // see PASS 3.4.1.a**)
- Solve problems involving addition and subtraction of time (**3.GM.3.2 // see PASS 3.4.2.a**)

**Data & Probability**

- Solve one- and two-step problems using categorical data (**3.D.1.2 // see PASS 3.5.1.a**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Number & Operations**

- Read, write, discuss, and represent whole numbers up to 1,000. Representations may include numerals, words, pictures, tally marks, number lines, and manipulatives (**2.N.1.1 // see PASS 3.2.1.a.i and 3.2.1.a.ii**)
- Use place value to compare and order whole numbers up to 1,000 using comparative language, numbers, and symbols (**2.N.1.6 // see PASS 3.2.1.b.i**)

**Geometry & Reasoning**

- Describe, compare, and classify two-dimensional figures according to their geometric attributes (**2.GM.1.2 // see PASS 3.3.1**)
- Recognize right angles and classify angles as smaller or larger than a right angle (**2.GM.1.4 // see PASS 4.3.2**)
- Recognize trapezoids and hexagons (**2.GM.1.1 // see PASS 4.3.3**)

**Data & Probability**

- Write and solve one-step word problems involving addition or subtraction using data represented within pictographs and bar graphs with intervals of one (**2.D.1.3 // see PASS 3.5.1.a**)

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# 4th Grade At-A-Glance

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## New Grade Level Concepts

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**Number & Operations**

- Multiply or divide by 10, 100, or 1,000 (**4.N.1.2**)
- Decompose a fraction more than one way (**4.N.2.3**)
- Represent tenths and hundredths (**4.N.2.5**)

**Algebraic Reasoning & Algebra**

- Geometric growth patterns (**4.A.1.3**)
- Solve problems involving unknowns (**4.A.2.1**)

**Geometry & Reasoning**

- Analyze three-dimensional shapes (**4.GM.1.3**)
- Develop the concept of volume (**4.GM.2.3**)
- Conversion of time (**4.GM.3.2**)

**Data & Probability**

- Frequency tables and line plots (**4.D.1.1**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction, and multiplication of multidigit whole numbers. Use various strategies, including the relationship between operations, the use of appropriate technology, and the context of the problem to assess the reasonableness of results (**4.N.1.5 // see PASS 3.2.2.b.iii and 4.1.2**)
- Determine the unknown addend or factor in equivalent and non-equivalent expressions (**4.N.1.7 // see PASS 4.1.2**)
- Use benchmark fractions (0, 1/4, 1/3, 1/2, 2/3, 3/4, 1) to locate additional fractions on a number line (**4.N.2.2 // see PASS 4.N.2.2**)
- Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks (**4.N.2.7 // see PASS 4.2.1.b.i**)
- Compare benchmark fractions (1/4, 1/3, 1/2, 2/3, 3/4) and decimals (0.25, 0.50, 0.75) in real-world and mathematical situations (**4.N.2.8 // see PASS 4.2.1.b.ii**)

**Geometry & Reasoning**

- Identify points, lines, line segments, rays, angles, endpoints, and parallel and perpendicular lines in various contexts (**4.GM.1.1 // see PASS 4.3.1**)

**Data & Probability**

- Use tables, bar graphs, timelines, and Venn diagrams to display data sets. The data may include benchmark fractions or decimals (**4.D.1.2 // see PASS 4.5.1.b**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Algebraic Reasoning & Algebra**

- Associative property of multiplication (**3.A.2.2 // see PASS 4.1.3**)

**Geometry & Reasoning**

- Recognize trapezoids and hexagons (**2.GM.1.1 // see PASS 4.3.3**)
- Recognize right angles and classify angles as smaller or larger than a right angle (**2.GM.1.4 // see PASS 4.3.2**)
- Classify angles as acute, right, obtuse, and straight (**3.GM.1.3 // see PASS 5.3.2**)
- Use formulas to determine the area of rectangles (**3.GM.2.2 // see PASS 4.4.1.d and 5.4.1.b**)
- Find the area of two-dimensional figures (**3.GM.2.8 // see PASS 4.4.1.d**)

Key:
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# 5th Grade At-A-Glance

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## New Grade Level Concepts

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**Number & Operations**

- Recognize that quotients can be represented in a variety of ways (**5.N.1.3**)
- Illustrate addition and subtraction of fractions (**5.N.3.2**)
- Find 0.1 more or less, 0.01 more or less, and 0.001 more or less than a number (**5.N.3.4**)

**Algebraic Reasoning & Algebra**

- Coordinate planes (**5.A.1.2**)
- Determine equality of an equation or inequality (**5.A.2.2**)

**Geometry & Reasoning**

- Describe, classify, and construct angles and triangles (**5.GM.1.1**)
- Volume of rectangular prisms (**5.GM.1.2**)
- Nets of three-dimensional figures (**5.GM1.3**)
- Surface area (**5.GM.2.2**)
- Measure to nearest centimeter or 1/16 of an inch (**5.GM.3.2**)
- Recognize and use the relationship between inches, feet, and yards (**5.GM.3.3**)
- Recognize and use the relationship between millimeters, centimeters, and meters (**5.GM.3.4**)

## Changed Concepts

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**Number & Operations**

- Estimate solutions to division problems in order to assess the reasonableness of results (**5.N.1.1 // see PASS 5.2.2.c**)
- Divide multi-digit numbers, by one- and two-digit divisors, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms (**5.N.1.2 // see PASS 5.2.2.c**)
- Represent, read and write decimals using place value to describe decimal numbers including fractional numbers as small as thousands and whole numbers as large as millions (**5.N.2.2 // see PASS 5.2.1.a**)
- Compare and order fractions and decimals, including mixed numbers and fractions less than one, and locate on a number line (**5.N.2.3 // see PASS 5.2.1.b**)
- Add and subtract fractions with like and unlike denominators, mixed numbers, and decimals, using efficient and generalizable procedures, including but not limited to standard algorithms in order to solve real-world and mathematical problems including money, measurement, geometry, and data (**5.N.3.3 // see PASS 5.2.2.a and 5.2.2.b**)

**Algebraic Reasoning & Algebra**

- Use tables and rules of up to two operations to describe patterns of change and make predictions and generalizations about real-world and mathematical problems (**5.A.1.1 // see PASS 5.1.1**)

**Geometry & Reasoning**

- Find the perimeter of polygons and create arguments for reasonable values for the perimeter of shapes that include curves (**5.GM.2.3 // see PASS 5.4.1.b**)

**Data & Probability**

- Find the measures of central tendency (mean, median, or mode) and range of a set of data. Understand that the mean is a "leveling out" or central balance point of the data (**5.D.1.1 // see PASS 5.5.5**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Geometry & Reasoning**

- Classify angles as acute, right, obtuse, and straight (**3.GM.1.3 // see PASS 5.3.2**)
- Use formulas to determine the area of rectangles (**3.GM.2.2 // see PASS 4.4.1.d and 5.4.1.b**)
- Measure angles in geometric figures and real-world objects with a protractor or angle ruler (**4.GM.2.1 // see PASS 5.4.1.a)**

**Data & Probability**

- Solve one- and two-step problems using data in whole number, decimal, or fraction form in a frequency table and line plot (**4.D.1.3 // see PASS 5.5.1.a**)

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# 6th Grade At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Number & Operations**

- Represent rational numbers and integers (**6.N.1.1**)
- Understand percents and ratios as they relate to 100 (**6.N.1.3**)
- Find GCF and LCM and use to calculate (**6.N.1.6**)
- Ratios, unit rates, and rational numbers (**6.N.3.1-4)**
- Illustrate multiplication and division of fractions (**6.N.4.2**)

**Geometry & Measurement**

- Find the area of square, parallelograms, and triangles (**6.GM.1**)
- Relationships between angles in triangles and formed by intersecting lines (**6.GM.2**)
- Choose and convert measurements (**6.GM.3**)
- Use transformations to establish congruency and understand symmetries (**6.GM.4**)

**Data & Probability**

- Create and analyze box and whisker plots (**6.D.1.3**)
- Represent and understand certainty, sample space, and relative frequencies (**6.D.2**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Compare and order rational numbers and integers (**6.N.1.2 // see PASS 6.2.1**)
- Use arithmetic with rational numbers to solve real-world and mathematical problems (**6.N.4.4 // see PASS 6.2.2.a-c**)

**Algebraic Reasoning & Algebra**

- Generate equivalent expressions and evaluate expressions using algebraic properties and order of operations (**6.A.2.1 // see PASS 6.1.2 and 6.1.4**)
- Represent situations using expressions, equations, and inequalities involving variables and rational numbers (**6.A.3.1 // see PASS 6.1.2**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Number & Operations**

- Solve real-world and mathematical problems requiring addition, subtraction, multiplication, and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results (**5.N.1.4 // see PASS 6.2.2.d**)

**Algebraic Reasoning & Algebra**

- Evaluate expressions involving variables when values for the variables are given (**5.A.2.3 // see PASS 6.1.3**)

**Geometry & Measurement**

- Describe and classify three-dimensional figures including cubes, rectangular prisms, and pyramids by the number of edges, faces or vertices as well as the shapes of faces (**5.GM.1.2 // see PASS 6.3.1**)
- Recognize and draw a net for a three-dimensional figure (**5.GM1.3 // see PASS G.4.3**)
- Recognize that the volume of rectangular prisms can be determined by the number of cubes and by the product of the dimensions of the prism. Know that rectangular prisms of different dimensions can have the same volume (**5.GM.1.2 // see PASS 8.4.1**)
- Recognize that the surface area of a three-dimensional figure can be found by finding the area of each component of the net of that figure. Know that three-dimensional shapes of different dimensions can have the same surface area (**5.GM.2.2 // see PASS 8.4.1**)

**Data & Probability**

- Create and analyze line and double-bar graphs with whole numbers, fractions, and decimals increments (**5.D.1.2 // see PASS 6.5.1**)

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# 7th Grade At-A-Glance

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## New Grade Level Concepts

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**Number & Operations**

- Rational numbers and equivalent fractions (**7.N.1**)
- Estimate and illustrate solutions of multiplication and division of integers (**7.N.2.1-2**)
- Solve problems involving rational numbers and positive integer exponents (**7.N.2.3-5**)
- Absolute value as the distance from zero (**7.N.2.6**)

**Algebraic Reasoning & Algebra**

- Proportional and inversely proportional relationships, their graphs, and the unit rate (**7.A.1**)
- Represent proportional relationships and make connections to unit rate (**7.A.2.1**)
- Assess reasonableness of solutions (**7.A.2.4**)
- Use order of operations with grouping symbols on calculators and other technologies (**7.A.4.2**)

**Geometry & Measurement**

- Surface area and volume of rectangular prisms with rational-valued edge lengths (**7.GM.1**)
- Proportional relationship between diameter and circumference (**7.GM.3.1**)
- Scale factors and dilations (**7.GM.4.1**)

**Data & Probability**

- Use proportional reasoning to display and interpret data in circle graphs and histograms (**7.D.1.2**)
- Describe probabilities as fraction of sample space or fraction of area (**7.D.2.1**)
- Make conclusions and predictions based on probabilities (**7.D.2.2**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Solve problems involving rational numbers and integer exponents (**7.N.2.5 // see PASS 7.2.2.c**)

**Algebraic Reasoning & Algebra**

- Represent, write, solve, and graph problems leading to linear inequalities that include nonnegative rational numbers (**7.A.3.2 // see PASS 7.1.3**)
- Represent real-world and mathematical situations using equations and inequalities (**7.A.3.3 // see PASS 7.1.2-3**)
- Use properties of operations to generate equivalent numerical and algebraic expressions containing rational numbers, grouping symbols and whole number exponents (**7.A.4.1 // see PASS 7.2.2.c**)

**Geometry & Measurement**

- Develop and use area of a trapezoid to solve problems (**7.GM.2.1 // see PASS**)
- Find area and perimeter of composite figures to solve real-world and mathematical problems (**7.GM.2.2 // see PASS**)
- Use scale factors to describe similarity and solve problems involving dilations (**7.GM.4.1-2 // see PASS**)
- Graph and describe translations and reflections on the coordinate plane and determine vertices after transformation (**7.GM.4.3 // see PASS**)

**Data & Probability**

- Use measures of central tendency to draw conclusion and make predictions (**7.D.1.1 // see PASS**)
- Determine theoretical probability of an event and represent as percent, fraction, and decimal between 0 and 1 (**7.D.2.1**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Number & Operations**

- Solve mixture and concentration problems using ratios, fractions, and percents (**6.N.3.3 // see PASS 7.2.2.a**)

**Geometry & Measurement**

- Recognize and draw a net for a three-dimensional figure (**5.GM1.3 // see PASS G.4.3**)
- Recognize that the volume of rectangular prisms can be determined by the number of cubes and by the product of the dimensions of the prism. Know that rectangular prisms of different dimensions can have the same volume (**5.GM.1.2 // see PASS 8.4.1**)
- Recognize that the surface area of a three-dimensional figure can be found by finding the area of each component of the net of that figure. Know that three-dimensional shapes of different dimensions can have the same surface area (**5.GM.2.2 // see PASS 8.4.1**)
- Calculate area of square, parallelograms, and triangles (**6.GM.1 // see PASS 7.4.1 and 7.4.3**)
- Predict, describe, and apply translations (slides), reflections (flips), and rotations (turns) to a two-dimensional figure (**6.GM.4.1 // see PASS 7.3.3**)

Key:
(Oklahoma Academic Standard for Mathematics)
(Oklahoma Academic Standard for Mathematics // Corresponding PASS Objective)

# Pre-Algebra At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Number & Operations**

- Classify rational and irrational numbers; rational numbers are closed under addition and multiplication (**PA.N.1.4**)
- Compare real numbers on a number line, perfect squares up to 400, and locate irrational numbers between integers (**PA.N.1.3**)

**Algebraic Reasoning & Algebra**

- Functions as a relationship between independent and dependent variables (**PA.A.1.1**)
- Linear functions can be expressed as *y=mx+b* or if its graph is a straight line (**PA.A.1.3**)
- Represent linear functions with various representations and describe relationships between variables (**PA.A.2.1-2**)
- Properties of linear functions (**PA.A.2.3**)
- Generate equivalent numerical and algebraic expressions and use properties to evaluate expressions (**PA.A.3**)

**Data & Probability**

- Display and interpret data using scatterplots and approximate lines of best fit; use line of best fit and average rate of change to make predictions and draw conclusions about data (**PA.D.1**)
- Calculate experimental probabilities and make predictions (**PA.D.2.1**)
- Compare and contrast dependent and independent events (**PA.D.2.3**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Generate equivalent numerical and algebraic expressions using the properties of integer exponents (**PA.N.1.1 // see PASS 8.2.2.a**)

**Algebraic Reasoning & Algebra**

- Use linear functions to represent and explain real-world and mathematical situations (**PA.A.1.2 // see PASS 8.1.1.a**)
- Illustrate, write, and solve problems using linear equations with one solution, infinitely many solutions, or no solutions (**PA.A.4.1 // see PASS 8.1.1.a**)
- Represent real-world situations using equations and inequalities involving one variable (**PA.A.4.3 // see PASS 8.1.2**)

**Geometry & Measurement**

- Informally justify the Pythagorean Theorem and use the theorem to solve problems in two and three dimensions involving right triangles (**PA.GM.1.1 // see PASS 8.3.2**)
- Calculate surface area of a cylinder using decomposition or nets (**PA.GM.2.2 // see PASS 8.4.1**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Number & Operations**

- Solve problems involving rational numbers and integer exponents (**7.N.2.5 // see PASS 8.2.2.c**)

**Geometry & Measurement**

- Recognize and draw a net for a three-dimensional figure (**5.GM1.3 // see PASS G.4.3**)
- Recognize that the volume of rectangular prisms can be determined by the number of cubes and by the product of the dimensions of the prism. Know that rectangular prisms of different dimensions can have the same volume (**5.GM.1.2 // see PASS 8.4.1**)
- Recognize that the surface area of a three-dimensional figure can be found by finding the area of each component of the net of that figure. Know that three-dimensional shapes of different dimensions can have the same surface area (**5.GM.2.2 // see PASS 8.4.1**)
- Surface area and volume of rectangular prisms with rational-valued edge lengths (**7.GM.1 // see PASS 8.4.1**)
- Use scale factors to describe similarity and solve problems involving dilations (**7.GM.4.1-2 // see PASS 8.4.2**)

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# Algebra 1 At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Number & Operations**

- Operations with square roots and simplifying (**A1.N.1.2**)

**Algebraic Reasoning & Algebra**

- Represent and graph compound and absolute value inequalities (**A1.A.2.2**)
- Solve systems of two equations; graph and interpret solutions (**A1.A.2.3**)
- Arithmetic and geometric sequences (**A1.A.3.5-6**)

**Functions**

- Write functions (using function notation) to model situations (**A1.F.1.3**)
- Linear piecewise functions (**A1.F.1.4**)
- Operations using function notation (**A1.F.3.3**)

**Data & Probability**

- Describe and compare data sets using summary statistics (**A1.D.1.1**)
- Determine regression lines and correlation coefficients to make predictions and assess reliability (**A1.D.1.2**)
- Discrete versus continuous graphs (**A1.D.1.3**)
- Counting procedures such as multiplication and addition principles and tree diagrams (**A1.D.2.1**)
- Venn diagrams (unions, intersections, complements) (**A1.D.2.2**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Write square roots and <u>cube roots</u> in simplest radical form (**A1.N.1.1 // See PASS A1.1.2.a**)

**Algebraic Reasoning & Algebra**

- Solve equations with rational values involving <u>angle measures</u> (**A1.A.1.1 // See PASS A1.1.1.c**)
- <u>Solve</u> and interpret absolute value equations (**A1.A.1.2 // See PASS A1.1.2.a**)
- Evaluate expressions including <u>nonstandard operations</u> (**A1.A.3.4 // See PASS A1.1.2.a**)
- Express and <u>convert between</u> linear equations in slope-intercept, point-slope, and standard forms (**A1.A.4.3 // See PASS A1.2.2.d**)
- Translate between graphs and <u>situations described qualitatively</u> (**A1.A.4.4 // See PASS A1.2.2.e**)

**Functions**

- <u>Identify restrictions</u> on the domain and range in real-world contexts (**A1.F.1.1 // See PASS A1.2.1.c**)
- Understand that <u>exponential functions grow by equal factors over equal intervals</u> (**A1.F.2.1 // See PASS A1.2.1.a**)
- Identify and <u>generate</u> equivalent representations of linear functions (**A1.F.3.1 // See PASS A1.2.2.e**)
- Evaluate a function <u>using function notation</u> and <u>interpreting results in context</u> (**A1.F.3.2 // See PASS A1.2.1.d**)

**Data & Probability**

- Apply probability concepts to make informed decisions (**A1.D.2.4 // See PASS A1.3.1.c**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Algebraic Reasoning & Algebra**

- Functions define a relationship between independent and dependent variables (**PA.A.1.1 // see PASS A1.2.1.c**)
- Linear functions can be expressed as $y=mx+b$ or if its graph is a straight line (**PA.A.1.3 // see PASS A1.2.1.a**)
- Represent linear functions with tables, verbal descriptions, and graphs; translate from one to another (**PA.A.2.1 // see PASS A1.2.1.d and A1.2.2.e**)

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# Geometry At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Reasoning & Logic**

- Understand undefined terms, definitions, postulates, and theorems in logical arguments/proofs (**G.RL.1.1**)

**Circles**

- Recognize and write the radius, center, and standard form of the equation of a circle with and without graphs (**G.C.1.3**)
- Apply distance and midpoint formulas to develop the equation of a circle in standard form (**G.C.1.4**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Two-Dimensional Shapes**

- Construct logical arguments to prove triangle congruence (SSS, SAS, ASA, AAS, and HL) and triangle similarity (AA, SSS, SAS) (**G.2D.1.8 // see PASS G.2.4.a and G.2.5**)
- Solve problems on the coordinate plane and identify types of symmetry using numeric, graphic, and algebraic representations of transformations in two-dimensions, such as reflections, translations, dilations, and rotations about the origin by multiples of 90° (**G.2D.1.9 // see PASS G.5.2.b**)

**Right Triangle Trigonometry**

- Apply distance formula and the Pythagorean Theorem and its converse to solve real-world and mathematical problems (**G.RT.1.1 // see PASS G.3.1**)
- Use trigonometric and inverse trigonometric functions to determine unknowns in a right triangle (**G.RT.1.3 // see PASS G.3.3**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Three-Dimensional Shapes**

- Recognize and draw a net for a three-dimensional figure (**5.GM1.3 // see PASS G.4.3**)

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# Algebra 2 At-A-Glance

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## New Grade Level Concepts

*New Grade Level Concepts* are new ideas to the grade level that were not explicitly addressed in PASS

**Number & Operations**

- Find the value of $i^n$ for any whole number n (**A2.N.1.1**)
- Use matrices to organize and represent data; identify the order (dimension), add, subtract, and multiply matrices to solve problems (**A2.N.1.3**)

**Algebraic Reasoning & Algebra**

- Solve square root equations with one variable and check for extraneous solutions (**A2.A.1.5**)
- Solve common and natural logarithmic equations using the properties of logarithms (**A2.A.1.6**)
- Factor polynomial expressions (**A2.A.2.1**)
- Recognize equivalent representations of a quadratic function; identify and use most appropriate to solve real-world and mathematical problems (**A2.A.2.3**)

**Functions**

- Graph a radical function and identify intercepts (**A2.F.1.7**)
- Graph piecewise functions with no more than three branches (including linear, quadratic, or exponential branches) and analyze the function (**A2.F.1.8**)

**Data & Probability**

- Choose to create discrete or continuous graphical representation based on real-world context (**A2.D.1.3**)
- Analyze statistical thinking to draw inferences, make predictions, and justify conclusions (**A2.D.2**)

## Changed Concepts

*Changed Concepts* are those that are related to grade-level PASS standards with changes underlined

**Number & Operations**

- Understand and apply the relationship of rational exponent to integer exponents and radicals to solve problems (**A2.N.1.4 // see PASS A2.1.1.a-b**)

**Algebraic Reasoning & Algebra**

- Represent problems using quadratic equations and solve; find non-real roots when they exist (**A2.A.1.1 // see PASS A2.2.3.a and A2.2.3.c**)
- Solve one-variable rational equations and check for extraneous solutions (**A2.A.1.3 // see PASS A2.2.7.a**)
- Solve polynomial equations with real roots using methods that may include technology (**A2.A.1.4 // see PASS A2.2.6.a**)
- Represent and solve problems using systems of linear equations with a maximum of three variables (**A2.A.1.8 // see PASS A2.2.2.a-b**)

**Functions**

- Use algebraic, interval, and set notation to specify the domain and range of functions and evaluate the function at a given point in its domain (**A2.F.1.1 // see PASS A2.2.1.d**)
- Analyze the graph of a polynomial function by identifying the domain, range, intercepts, zeros, relative maxima and minima, and intervals of increase and decrease (**A2.F.1.5 // see PASS A2.2.6.c**)
- Graph a rational function identifying intercepts, horizontal and vertical asymptotes (**A2.F.1.6 // see PASS A2.2.7.c**)

**Data & Probability**

- Use the mean and standard deviation of a data set to fit it to a normal distribution (**A2.D.1.1 // see PASS A2.3.2.b**)

## Critical Gaps

*Critical Gaps* must be taught in 2016-2017 to ensure students do not skip these concepts.

**Algebraic Reasoning & Algebra**

- Solve systems of two equations; graph and interpret solutions (**A1.A.2.3 // See PASS A2.2.2.b**)
- Recognize that arithmetic sequences are linear and find next term (**A1.A.3.5 // See PASS A2.3.3**)
- Recognize that geometric sequences are exponential and find next term; define meaning of initial term and common ratio (**A1.A.3.6 // See PASS A2.3.3**)

**Functions**

- Operations using function notation (**A1.F.3.3 // See PASS A2.2.1.b**)

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