

Content Standard: ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools and technologies.		
Guiding Question: How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?		
Students in K-12 should understand and describe patterns and functional relationships.		
K	1	2
<p>Students in Kindergarten should sort and classify objects using attributes</p> <p>(1) Sort and classify objects by size, shape, color, texture, use, position and orientation and describe the reason for the action.</p>	<p>Students in grade 1 should examine attributes of objects and describe their relationships.</p> <p>(Alg.1.1) Sort, classify and order objects and numbers based on one and two attributes and describe the rule used.</p> <p>(Alg.1.2) Recognize, extend, describe and create a variety of patterns, and translate the same pattern from one representation (such as color) to another representation (such as shape) <i>including growing patterns.</i></p> <p>(Alg.1.3) Describe counting patterns and number patterns.</p> <p>(Alg.1.4) Develop and test generalizations based on observations of patterns and relationships.</p>	<p>Students in grade 2 should describe and extend patterns.</p> <p>(1) Describe and classify data and objects based on more than one attribute.</p> <p>(2) Use patterns and the rules that describe them to identify a missing object, objects with common or different attributes, and the complement of a set of objects.</p> <p>(3) Explore a variety of ways to describe and write rules for patterns.</p>
<p>Students in Kindergarten should identify a pattern and describe the rule using the physical attributes or position of objects in a sequence.</p> <p>(1) Recognize, copy and extend patterns of sounds, colors, shapes, textures and numbers in a variety of contexts and describe the rule of the pattern</p> <p>Make comparisons and describe qualitative</p>		<p>Students in grade 2 should analyze change in terms of quantity and quality using patterns.</p> <p>(1) Explore and describe number patterns including odd and even numbers, counting by 2s, 5s, 10s, 100s and counting on by 10.</p> <p>(2) Make comparisons of data and analyze observable changes using qualitative and quantitative descriptions.</p>

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<p>and quantitative changes of a given pattern (more, less, bigger, smaller, longer, one more, one less).</p>		
<p>Students in K-12 should represent and analyze quantitative relationships in a variety of ways.</p>		
	<p style="text-align: center;">1</p> <p>Students in grade 1 should represent the result of counting, combining and separating sets of objects using number sentences.</p> <p><i>(Alg.1.5) Model real-life situations that involve addition and subtraction of whole numbers using objects, pictures and open sentences.</i></p>	<p style="text-align: center;">2</p> <p>Students in grade 2 should represent real-life situations using number sentences.</p> <p><i>(1) Model situations involving addition and subtraction of whole numbers using objects, pictures, symbols and open sentences.</i></p>
<p>Students in K-12 should use operations, properties and algebraic symbols to determine equivalence and solve problems.</p>		
	<p style="text-align: center;">1</p> <p>Students in grade 1 should identify quantities as equivalent or non-equivalent.</p> <p><i>(Alg.1.6) Demonstrate balance or equivalence using models.</i></p> <p><i>(Alg.1.7) Use the “turn around” idea the commutative property to figure out related addition facts.</i></p>	<p>Students in grade 2 should represent quantities that have the same value with an equal sign.</p> <p><i>(1) Demonstrate understanding of the = sign as an equality symbol.</i></p>

Content Standard: NUMERICAL AND PROPORTIONAL REASONING

Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools and technologies.

Guiding Question:

How are quantitative relationships represented by numbers?

Students in K-12 should understand that a variety of numerical representations can be used to describe quantitative relationships.

K	1	2
<p>Students in Kindergarten should use numbers to count, order, compare, label, locate and measure.</p> <p>(1) Use numbers to locate, order, label and measure. (2) Identify the numerals 1-10 and match sets of objects to the numerals. (3) Compare sets using the terms “more,” “less” or “the same” and order sets from least to greatest. (4) Identify ordinal position of objects, first through fifth, and last. (5) Act out story problems and solve practical problems using objects.</p>	<p>Students in grade 1 should represent and order two-digit numbers as groups of tens and ones in the base ten place value system..</p> <p>(Num.1.1) Estimate and describe quantity with benchmark amounts such as 0, 10 and 100. (Num.1.2) Represent two-digit numbers on number lines and using models. (Num.1.3) Determine and compare values and trade with sets of pennies, <i>nickels</i> dimes, and <i>explore quarters</i>. (Num.1.4) Identify ordinal position of objects, first through tenth. (Num.1.5) <i>Represent a two digit number as tens and ones with concrete and pictorial models.</i></p>	<p>Students in grade 2 should represent three-digit numbers as groups of hundreds, tens and ones in the base ten place value system.</p> <p>(1) Use place value models and pictures to represent two- and three-digit numbers and write numbers in expanded and regrouped forms. (2) Locate, label and order two- and three-digit numbers using place value models, pictures and number lines. (3) Use place value models, pictures and number lines to identify 10 more and 10 less and 100 more and 100 less than a number. (4) Count with and trade pennies, dimes and dollars and determine and compare values.</p>

<p>Students in Kindergarten should share equal parts of an object.</p> <p>(1) Use a variety of models to identify a whole and a half of an object. (2) Compare two parts of a whole and describe the parts as closer to a whole, or closer to very little. (3) Recognize that two halves can be put together to make a whole.</p>	<p>Students in grade 1 should identify and compare equal parts of a whole.</p> <p>(Num.1.6) Identify and represent $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ of a whole and identify portions that are not halves, thirds or fourths. (Num.1.7) Compare parts of a whole object and estimate whether they are closer to a very little, one half or one whole. (Num.1.8) Make a whole of equal-sized parts of familiar objects.</p>	<p>Students in grade 2 should represent fractions by sharing portions of equal size as parts of a whole or parts of a set.</p> <p>(1) Model and describe equal parts of a whole as unit fractions $\frac{1}{2}$ through $\frac{1}{10}$. (2) Use models and familiar objects to estimate, compare and order unit fractions ($\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$) of a whole. (3) Estimate and use counting and grouping of objects to find equal parts of a small set of counting objects, such as $\frac{1}{2}$, $\frac{1}{3}$ or $\frac{1}{4}$ of 12 cookies. (4) Explore equivalent fractions using models.</p>
<p>Students in Kindergarten should share a set of objects that is divided into groups with equal amounts.</p> <p>(1) Share a set of objects considered to be a whole by forming two smaller sets that have equal amounts.</p>	<p>Students in grade 1 should partition a set of objects into smaller groups with equal amounts.</p> <p>(Num.1.9) Identify half of a small set of objects considered to be the whole. (Num.1.10) <i>Find $\frac{1}{2}$ of a set or group of objects.</i></p>	<p style="text-align: center;">2</p> <p>Students in grade 2 should recognize that the denominator of a fraction tells how many equal parts an object or a set has been divided into, and that the numerator indicates how many of the parts are being considered.</p> <p>(1) Identify and build models of fractional parts of a whole (such as $\frac{3}{4}$), other than unit fractions. (2) Explore and describe addition with like denominators and write matching fraction sentences using models.</p>
	<p>Students in grade 1 should describe relationships between quantities using ratios.</p> <p>(Num.1.11) Describe patterns with simple ratios using familiar contexts, such as 1 cat has 4 legs, 2 cats have 8 legs.</p>	<p>Students in grade 2 should describe relationships between quantities using ratios.</p> <p>(1) Describe simple ratios in patterns using models and pictures (e.g., in a pattern of green, green, red blocks, there are always two green blocks for each red block).</p>

Students in K-12 should use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.		
K	1	2
<p>Students in Kindergarten should count, adding one more to the previous number, and group and count by ones and tens.</p> <p>(1) Count to and past 10 to 20, then to 30, and group and count objects by 10. (2) Estimate the amount of objects in a set using 10 as a benchmark, and then count to determine if the amount is more or less than 10. (3) Identify sets and numbers, which are equal and one more. (4) Recognize and name pennies and dimes; count and trade pennies for objects.</p>	<p>Students in grade 1 should count by groups, add one more to the grouping and compare values of groups.</p> <p>(Num.1.12) Count whole numbers to 100. (Num.1.13) Identify, read and write numerals to 100 and beyond. (Num.1.14) Group and skip count by 2s, 5s and 10s. (Num.1.15) Count on from a given amount, orally and with models, and count back from 10. (Num.1.16) Identify 1 more and 1 less and explore 10 more and 10 less than a number. (Num.1.17) <i>Explore two more and two less in relation to equations.</i></p>	<p>Students in grade 2 should develop fact families of basic facts using the inverse relationship of addition and subtraction.</p> <p>(1) Recall basic addition and subtraction facts. (2) Identify reasonable answers and solve addition and subtraction problems involving real-world experiences.</p>
	<p>Students in grade 1 should add by counting and combining and subtract by separating, comparing or counting on.</p> <p>(Num.1.18) Write number sentences and use objects and pictures to model and solve addition and subtraction story problems. (Num.1.19) Develop, describe and use a variety of strategies to add and subtract one-digit numbers. (Num.1.20) Explore finding the sum of two two-digit numbers using models and counting strategies. (Num.1.21) Identify reasonable answers to problems that reflect real-world experiences. (Num.1.22) <i>Identify and explain the relationship between addition and subtraction.</i></p>	<p>Students in grade 2 should explore the relationship of multiplication and division through a variety of methods.</p> <p>(1) Explore multiplication by extending number patterns, skip counting, combining repeated addends, building models of groups the same size and using arrays and pictures. (2) Explore the connection between multiplication and division using models and pictures of groups and arrays.</p>

		<p>Students in grade 2 should. identify and use equivalent representations of numbers to estimate and compute.</p> <p>(1) Compare and round numbers to the nearest 10 using place value models and number lines. (2) Explore and describe strategies for representing, estimating, adding and subtracting two two-digit numbers with and without regrouping. (3) Recognize when an estimate is appropriate and use estimation strategies that result in identifying a reasonable answer to a problem.</p>

GEOMETRY AND MEASUREMENT

Shapes and structures can be analyzed, visualized, measured and transformed using a variety of strategies, tools and technologies.

Guiding Question:

How do geometric relationships and measurements help us to solve problems and make sense of our world?

Students in K-12 should use properties and characteristics of two- and three-dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.

K

Students in Kindergarten should identify and sort shapes and solids by physical characteristics.

- (1) Sort, order, compare and use comparative language to describe small sets of objects sequenced by size, length, area and volume.
- (2) Identify, sort and compare two- and three-dimensional shapes and solids in the environment, such as triangles, squares, rectangles, circles, cubes, spheres, cylinders and cones.
- (3) Use a variety of materials to create geometric shapes and solids and build copies of simple shapes and designs by direct observation and by visual memory.

1

Students in grade 1 should classify shapes and solids by common characteristics.

- (GeoMeas.1.1) Sort, build, name and draw two- and three-dimensional objects.
- (GeoMeas.1.2) Use a variety of materials to create two- and three-dimensional designs and copy them from visual memory.
- (GeoMeas.1.3) Create and explore shapes and designs with a line of symmetry.

2

Students in grade 2 should identify shapes as the same when there are changes in position.

- (1) Explore translations (slides), reflections (flips) and rotations (turns) of simple polygons using manipulative materials.
- (2) Build and identify shapes that have one or more lines of reflective symmetry or that can be divided into two congruent parts.
- (3) Explore filling a two-dimensional region with different shapes.

Students in K-12 should use spatial reasoning, location and geometric relationships to solve problems.

K	1	2
<p>Students in Kindergarten should use positional language to describe location, direction and position of objects.</p> <p>(1) Describe the position, location and direction of objects, or parts of objects, using terms such as inside, outside, top, bottom, close, closer, etc.</p>	<p>Students in grade 1 should describe, name and interpret direction and position of objects.</p> <p>(GeoMeas.1.4) Indicate relative position, direction and location with terms such as inside, outside, top, bottom, left and right.</p> <p>(GeoMeas.1.5) Students will describe attributes and parts of 3-D shapes (points, faces and edges).</p>	<p>Students in grade 2 should recognize and use geometric relationships to solve problems.</p> <p>(1) Explore combining and subdividing polygons and solids with manipulative materials and reconstruct them from visual memory.</p> <p>(2) Build, describe, draw and identify polygons, solids and other two- and three-dimensional objects found in the environment.</p>

Students in K-12 should develop and apply units, systems, formulas and appropriate tools to estimate and measure.		
K	1	2
<p>Students in Kindergarten should use calendars and clocks to measure and record time.</p> <p>(1) Locate a date on the calendar (yesterday, today and tomorrow) and sequence events using terms like before and after.</p>	<p>Students in grade 1 should plan and sequence events.</p> <p>(GeoMeas.1.6) Estimate and compare the length of time needed to complete tasks using terms such as longer or shorter. (GeoMeas.1.7) Use the calendar to identify dates, days, weeks and months and to plan and sequence events. (GeoMeas.1.8) Tell time to the hour with analog and digital clocks. (GeoMeas.1.9) <i>Tell time to the half hour with analog and digital clocks.</i></p>	<p>Students in grade 2 should estimate and measure the length of time to complete activities and tasks.</p> <p>(1) Use the calendar to write and solve problems involving time. (2) Tell time to the half-hour, and explore time to the quarter-hour (analog and digital).</p>
<p>Students in Kindergarten should use nonstandard units to estimate measures of length, area, temperature, weight and capacity.</p> <p>(1) Estimate the number of objects in a handful, and then count to verify. (2) Estimate the amount of objects in a set using benchmarks of 10, and count to determine if the estimate is more or less. (3) Explore, describe and discuss strategies to estimate length, area, temperature and weight using nonstandard units to compare. (4) Explore using everyday objects as nonstandard units to measure length, area and capacity. (5) Compare the weight of two objects using a balance scale and identify which is heavier.</p>	<p>Students in grade 1 should estimate length, area, volume, weight and temperature using nonstandard units.</p> <p>(GeoMeas.1.10) Use physical referents to make estimates and to determine and describe the reasonableness of answers to measurement problems. (GeoMeas.1.11) Use estimation, physical referents and nonstandard units to sort and compare objects.</p>	<p>Students in grade 2 should measure through direct comparison and through repetition of units.</p> <p>(1) Develop and use nonstandard referents and standard benchmarks to estimate and measure length, area, weight, capacity and volume. (2) Identify reasonable estimates and describe the strategies used to determine the estimates. (3) Explore using measurement tools such as thermometers, basic rulers and balance scales to measure temperature, length and weight.</p>

	<p>Students in grade 1 use standard units of measure to communicate measurement in a universal manner.</p> <p>(GeoMeas.1.12) Explore using the standard units of inch and centimeter to estimate and measure length.</p>	

Content Standard: WORKING WITH DATA: PROBABILITY AND STATISTICS Data can be analyzed to make informed decisions using a variety of strategies, tools and technologies.		
Guiding Question: How can collecting, organizing and displaying data help us analyze information and make reasonable predictions and informed decisions?		
Students in K-12 should collect, organize and display data using appropriate statistical and graphical methods.		
K	1	2
<p>Students in Kindergarten should visualize information and make comparisons about information displayed in real and picture graphs.</p> <p>(1) Pose questions about personal information, experiences and environment. (2) Explore ways to record and organize data using tallies and tables. (3) Construct real graphs and picture graphs and describe the data using the terms more, less and same. (4) Organize information through systematic counting, sorting, making lists and graphic organizers.</p>	<p>Students in grade 1 should collect, organize, record and describe data.</p> <p>(Data.1.1) Pose questions and collect, organize, record and describe data using tallies, tables, real graphs, picture graphs, glyphs (coded pictures) and bar graphs.</p>	<p>Students in grade 2 should construct graphs from data, then make comparisons and draw conclusions.</p> <p>(1) Pose questions and systematically collect, sort, organize, record and analyze data using tables, charts and picture and bar graphs. (2) Use comparative terms to describe data.</p>
Students in K-12 should analyze data sets to form hypotheses and make predictions.		
<p>Students in Kindergarten should extend different types of patterns and make predictions.</p> <p>(1). Identify visual, auditory and physical patterns and extend to make predictions.</p>	<p>Students in grade 1 should organize data in tables and graphs and make comparisons of the data.</p> <p>(Data.1.2) Use various methods to organize information including lists, systematic counting, sorting, graphic organizers and tables. (Data.1.3) Use comparative language to describe the data in tables and graphs.</p>	<p>Students in grade 2 should determine patterns and make predictions from data displayed in tables and graphs.</p> <p>(1) Investigate combinations using models.</p>

Students in K-12 should understand and apply basic concepts of probability

<p>Students in Kindergarten should observe the frequency of real-world events and identify the likelihood of future events.</p> <p>(1) Describe the likelihood of events related to personal experiences. (2) Engage in simple probability activities and discuss the results.</p>	<p>Students in grade 1 should determine the likelihood of certain events through simple experiments and observations of games.</p> <p>(Data.1.4) Observe, record, graph and describe the results of simple probability activities and games. (Data.1.5) Describe and explain the likelihood of various events in the students' world.</p>	<p style="text-align: center;">2</p> <p>Students in grade 2 should analyze data gathered from experiments and identify the likelihood of future events.</p> <p>(1) Discuss the likelihood of various events, state possibilities, make predictions and test them in practical situations. (2) Conduct probability experiments and record the results in tables and graphs.</p>
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