Elementary Math Vertical Progressions Grades PK-2

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Standard 1: Algebraic Reasoning: Patterns and Relationships

Pre-Kindergarten	Kindergarten	1st Grade	2nd Grade
The child will sort and classify objects and analyze simple patterns.	**The student will sort and classify objects and analyze simple patterns.**	**The student will use a variety of problem-solving approaches to model, describe and extend patterns.**	**The student will use a variety of problem-solving approaches to model, describe and extend patterns.**
1. Sorts and groups objects into a set and explains verbally what the objects have in common (e.g., color, size, shape).	1. Sort and group objects into a set and explain verbally what the objects have in common (e.g., color, size, shape).	1. Describe, extend and create patterns using concrete objects (e.g., sort a bag of objects by attributes and orally communicate the pattern for each grouping).	1. Describe, extend, and create patterns using symbols, shapes, or designs (e.g., repeating and growing patterns made up of sets of shapes or designs, create patterns by combining different shapes and taking them apart).
2. Recognize patterns, repeat them, and explain them verbally	2. Explain verbally and extend simple patterns (e.g., ☐●☐●)	2. Describe, extend and create patterns with numbers in a variety of situations (e.g., addition charts, skip counting, calendars).	2. Formulate and record generalizations about number patterns in a variety of situations (e.g., addition and subtraction patterns, even and odd numbers, build a table showing the cost of one pencil at 10 cents, 2 pencils at 20 cents).
	3. Use object to demonstrate —related facts such as 3+4=7: 7-4=3.		3. Find unknown values in open number sentences with a missing addend and use to solve everyday problems.
		3. Demonstrate number patterns by counting as many as 100 objects by 1's, 2's, 5's and 10's.	
		4. Recognize and apply the commutative and identity properties of addition using models and manipulatives to develop computational skills (e.g., 2 + 4 = 4 + 2, 3 + 0 = 3).	4. Recognize and apply the associative property of addition (e.g., 3 + (2 +1) = (3 + 2) + 1).

Underlined phrases represent new or expanded knowledge from previous year

Standard 2: Number Sense and Operation

Pre-Kindergarten	Kindergarten	1st Grade	2nd Grade
The child will understand the relationship between numbers and quantities.	**The student will understand the relationship between numbers and quantities.**	**The student will read, write and model numbers and number relationships. The student will use models to construct basic addition and subtraction facts with whole numbers.**	**The student will use numbers and number relationships to acquire basic facts and will compute with whole numbers less than 100.**
1. Begins to associate number concepts, vocabulary, quantities, and written numerals in meaningful ways. 2. Begins to make use of one-to-one correspondence in counting objects and matching groups of objects. 3. Develops increasing ability to count in sequence to ten. 4. Counts objects in a set one-by-one from one through ten. 5. Identifies and creates sets of objects one through ten. 6. Identifies numerals one through ten. 7. Recognizes the numerical value of sets of objects through ten.	2. Pair and count objects using one-to-one correspondence (e.g., one napkin for each child at snack time). 3. Count forward to twenty and backward from ten. 4. Count objects in a set one-by-one from one through twenty. 5. Identify and create sets of objects zero through twenty. 6. Identify and write numerals zero through twenty, in and out of sequence. Children may still be reversing some numerals. 7. Identify and use ordinal numbers to order objects first through tenth.	1. Number Sense a. Use concrete models of tens and ones to develop the concept of place value. c. Read and write numerals to 100.	1. Number Sense a. Use concrete models of hundreds, tens, and ones to develop the concepts of place value and link the concepts to the reading and writing of numbers (e.g., base-10 blocks). b. Represent a number in a variety of ways (e.g., write 15 as 8 + 7, write 25 as 2 tens + 5 ones or as 1 ten + 15 ones).
	1. Compare a group or set to another group, set, or numerical quantity and verbally explain which has more, less, or equivalent quantities.	b. Compare objects by size and quantity (e.g., more than, less than, equal to). d. Manipulate physical models and recognize graphical representation of fractional parts (e.g., halves, thirds, fourths).	c. Write a number sentence to compare numbers less than 1,000 (e.g., 425 > 276, 73 < 107, page 351 comes after 350, 753 is between 700 and 800). d. Demonstrate (using concrete objects, pictures, and numerical symbols) fractional parts including halves, thirds, fourths and common percents (25%, 50%, 75%, and 100%).

Pre-Kindergarten	Kindergarten	1st Grade	2nd Grade
	8. Combine and remove objects from sets and verbally describe the result (e.g., adding objects to a set makes the set larger, subtracting objects from a set makes the set smaller.	2. Number Operations a. Develop and apply the concepts of addition and subtraction. i. Use models to construct addition and subtraction facts with sums up to twenty (e.g., counters, cubes). ii. Perform addition by joining sets of objects and subtraction by separating and by comparing sets of objects. iii. Demonstrate fluency (i.e., memorize and apply) with basic addition facts to make a maximum sum of 10 and the associated subtraction facts (e.g., 7+3=10 and 10-3=7). b. Write addition and subtraction number sentences for problem-solving situations. c. Acquire strategies for making computations using tens and ones to solve two-digit addition and subtraction problems without regrouping (e.g., use estimation, number sense to judge reasonableness, counting on, use base-ten blocks).	2. Number Operations a. Demonstrate fluency (i.e., memorize and apply) with basic addition facts to make a maximum sum of 18 and the associated subtraction facts (e.g., 15+3=18 and 18-3=15 b. Use strategies to estimation and solve sums and differences (e.g., compose, decompose and regroup numbers, use knowledge of 10 to estimate quantities and sums [two numbers less than 10 cannot add up to more than 20].) c. Solve two-digit addition and subtraction problems with and without regrouping using a variety of techniques. d. Use concrete models to develop understanding of multiplication as repeated addition and division as successive subtraction.

Underlined phrases represent new or expanded knowledge from previous year

Standard 3: Geometry

Pre-Kindergarten	Kindergarten	1st Grade	2nd Grade
The child will identify common geometric shapes and explore the relationship of objects in the environment.	**The student will identify common geometric shapes and explore the relationship of objects in the environment.**	**The student will use geometric properties and relationships to recognize and describe shapes.**	**The student will use geometric properties and relationships to recognize and describe shapes.**
1. Recognize, describe, compare, and name common shapes (e.g., circle, square, rectangle).	1. Identify, name, and describe a variety of basic two-dimensional geometric shapes such as squares, triangles, circles, rectangles, (regular) hexagons, and (isosceles) trapezoids presented in a variety of ways (e.g. with different sizes of orientation).	1. Sort and identify congruent shapes. 2. Identify, name, and describe two-dimensional geometric shapes (including rhombi) and objects in everyday situations (e.g., the face of a round clock is a circle, a desktop is a rectangle).	1. Identify symmetric and congruent shapes and figures. 2. Investigate and predict the results of putting together and taking apart two dimensional shapes.
	2. Identify, name, and describe a variety of three-dimensional geometric shapes such as spheres, cubes, and cylinders.	3. Identify, name and describe three-dimensional geometric shapes (including cones) and objects in everyday situations (e.g., a can is a cylinder, a basketball is a sphere).	
2. Demonstrate an understanding of directionality, order and position of objects, and words (e.g., on, under, above).	3. Model and use words indicating relative position or direction (e.g., students describe the relationships between self and objects in space using on, above, below, beside, under, on top of, behind, and over).	4. Use language to describe relationships of objects in space (e.g., above, below, behind, between).	

Standard 4: Measurement

Pre-Kindergarten	Kindergarten	1st Grade	2nd Grade
The child will explore the concepts of measurement.	**The student will explore the concepts of nonstandard and standard measurement.**	**The student will develop and use measurement skills in a variety of situations.**	**The student will use appropriate units of measure in a variety of situations.**
1. Linear Measurement. a. Measure objects using nonstandard units of measurement (e.g., pencil, paper clip, block).	1. Linear Measurement. a. Measure objects using nonstandard units of measurement (e.g., pencil, paper clip, block).	1. Linear Measurement: Measure objects with one-inch tiles and with a standard ruler to the nearest inch.	1. Linear Measurement a. Measure objects using standard units (e.g., measure length to the nearest foot, inch, and half inch). b. Select and use appropriate units of measurement in problem solving and everyday situations.
b. Compare objects according to observable attributes (e.g., long, longer, longest; short, shorter, shortest; big, bigger, biggest; small, smaller, smallest; small, medium, large). c. Compare and order objects in graduated order (e.g., shortest to tallest, thinnest to thickest).	b. Compare objects according to observable attributes (e.g., long, longer, longest; short, shorter, shortest; big, bigger, biggest; small, smaller, smallest; small, medium, large). c. Compare and order objects in graduated order (e.g., shortest to tallest, thinnest to thickest).		
	d. Identify the appropriate instrument used to measure length (ruler), weight (scale), time (clock: digital and analog; calendar: day, month, year, season), and temperature (thermometer).		
2. Time. Develop an awareness of simple time concepts within his/her daily life (e.g., yesterday, today, tomorrow; morning, afternoon, night).	2. Time. a. Tell time on digital and analog clocks to the hour. b. Identify the days of the week and months of the year.	2. Time a. Tell time on digital and analog clocks on the hour and half-hour. b. Develop the concepts of days, weeks, and months using a calendar.	2. Time a. Tell time on digital and analog clocks or the quarter-hour. b. Solve problems involving number of days in a week, month, or year and problems involving weeks in a month and year.

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Pre-Kindergarten	Kindergarten	1st Grade	2nd Grade
	3. Money. Identify the coins penny, nickel, dime, and quarter.	3. Money: Identify and name the value of pennies, dimes, nickels, and quarters.	3. Money a. Identify and count money up to a twenty dollar bill. b. Recognize and write different amounts of money using dollar and cent notation.

Standard 5: Data Analysis

Pre-Kindergarten	Kindergarten	1st Grade	2nd Grade
The child will collect, organize, and display data in a group setting.	**The student will collect and display data in a group setting.**	**The student will demonstrate an understanding of data collection and display.**	**The student will demonstrate an understanding of data collection, display, and interpretation.**
1. Begins to use numbers and counting as a means for solving problems and measuring quantity.	1. Data Analysis. a. Use numbers and counting as a means for solving problems and measuring quantity.	1. Data Analysis	1. Data Analysis
2. Develops growing abilities to collect, describe, and record information through a variety of means, including discussion, drawings, maps, charts, and graphs. 3. Describes similarities and differences between objects.	a. Develops abilities to collect, describe, and record information through a variety of means including discussion, drawings, maps, charts, and graphs. Describes similarities and differences between objects. b. Collects and analyze information about objects and events in the environment. c. Create and verbally explain a data display or graph (e.g., real object graph, pictorial graphs).	a. Organize, describe, and display data using concrete objects, pictures, or numbers. b. Formulate and solve problems that involve collecting and analyzing data common to children's lives (e.g., color of shoes, numbers of pets, favorite foods).	a. Collect, sort, organize, and display data in charts, bar graphs, and tables (e.g., collect data on teeth lost and display results in a chart). b. Summarize and interpret data in charts, bar graphs, and tables.