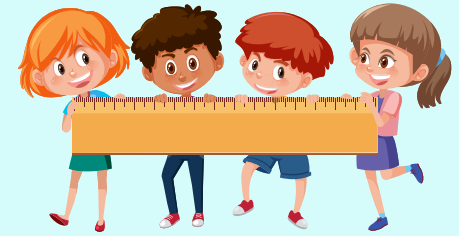




Humboldt County  
Office of Education

## 0 TO 8 MATH ALIGNMENT

# MEASUREMENT



**NEWBORN** Observes and explores size and shape of objects as they move through space.

**1 YEAR** Trial and error to discover how things move and fit through space. Makes simple comparisons between two objects.

**Example:** Putting smaller shape in correct hole

**2 YEARS** Predicts how things will fit rather than trial and error. Uses math vocabulary to describe size, location in space (big, little, more, less).

**3 YEARS** Begins to compare & order objects. Demonstrates awareness that objects are unique in their attributes. Orders objects by size.

**4 YEARS** Expands understanding of comparing, ordering, and measuring objects. Compares 2 objects directly and indirectly. Orders 4 or more objects by size. Measures length using multiple duplicates of same size object. Uses multiples of the same unit to measure; uses numbers to compare; knows the purpose of standard measuring tools.

**KINDERGARTEN** Describes attributes of objects such as length or weight. Describes several measurable attributes of single object. Uses some time measurements words. Uses measurement words and some standard measurement tools accurately; uses ordinal numbers from first to tenth.

**FIRST GRADE** Measures lengths indirectly & by integrating length units. Order 3 objects by length; compare the lengths of 2 objects indirectly by using a third object. Express the length of an object as a whole # of length units by laying multiple copies of a shorter object end to end. Understand that length measurement of an object is the # of same-size length units that span it with no gaps or overlaps. Tell and write time. Tell and write time in hours of half hours using analog and digital clocks. Represents and interprets data. Organize, represent, and interpret data with up to 3 categories. Ask and answer questions about total of data points, how many in each category, & how many more or less are in one category than in another.

**SECOND/THIRD GRADES** Measures and estimate lengths in standard units. Uses appropriate tools. Measures same length twice with different objects. Measures to compare objects. Relates addition and subtraction to length. Solves word problems using length. Works with time and money. Represents and interpret sdata, uses picture graphs and bar graphs. Tells and writes time to the nearest five minutes; indicates a.m. and p.m. Solves word problems involving coins and dollar bills, and expresses the answer using currency symbols.





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## 0 TO 8 MATH ALIGNMENT

# NUMBER SENSE



**8 MONTHS** Around 8 months of age children usually **focus on one object or person at a time**, yet may hold two objects, one in each hand.

**1.5 YEARS** Demonstrates understanding that there are **different amounts of things**. Demonstrates understanding of the concepts of one, two, and more. Verbally counts (not always in the correct order).

**3 YEARS** Shows understanding that **numbers represent how many** and demonstrate understanding of words. Recognizes and names a few numerals. Verbally counts to 10; counts up to five objects accurately, using one number name for each object.

**4 YEARS** **Understands numbers in the environment and understands the relationship.** Identifies numerals to 5 by name and connects each to counted objects. Makes sets of 6-10 objects and then describes the parts; identifies which part has more, less, or the same (equal); counts all or counts on to find out how many. Verbally counts to 20; counts 10-20 objects accurately; knows the last number states how many in all; tells what number (1-10) comes next in order by counting.

**5 YEARS** **Expanded understanding of numbers** and the relationship and operations. Adds and subtracts whole numbers fluently within five. Identifies numerals to 10 by name and connects each to counted objects. Uses number names while counting to 100; counts 30 objects accurately; tells what number comes before and after a specified number up to 20.

**KINDERGARTEN** **Counts to 100. Writes numbers 0-20.** Compares numbers 1-10 using greater than, less than, or equal to. Identifies numerals to 20 by name and connects each to counted objects; represents how many by writing one-digit numerals and some two-digit numerals. Solves simple equal share problems; makes sets of 11 -20 objects and then describes then parts.

**FIRST GRADE** **Adds and subtracts numbers fluently within 10** using mental strategies (counting on, making ten, decomposing/recomposing, addition/subtraction relationship, and easier equivalent known sums). Solves three-number word problems with answers within 20 using addition properties. Represents how many by writing one-, two-, and three-digit numerals to 120; uses relational symbols ( $<$ ,  $>$ ,  $=$ ) to indicate relationships between whole numbers. Answers how much questions about wholes portioned into equal size shares of two and four; verbally labels each part and describes its relationship to the whole. Counts to 120 to determine how many; uses skip counting by 2s, 5s, and 10s; begins counting forward at any number between 1 and 120; counts backwards from 20.

**SECOND GRADE** **Place value.** Ex:  $2+3=5$  and  $3+2=5$ . Use fractions of ones, tens, hundreds, and thousands. Adds and subtracts numbers fluently within 20 using previously learned mental strategies; knows all the addition combinations of two and one-digit numbers from memory. Solves one- and two- step word problems of various types using addition and subtraction (within 100) and explains strategies. Represents how many by writing one-, two-, three-, and four-digit numerals to 1000; uses relational symbols to compare and order whole umbers. Counts to 1,000 to determine how many; uses skip counting (2s, 5s, 10s, and 100s); begins counting forward at any number between 1 and 1000; switches between skip counts.

**THIRD GRADE** **Adds and subtracts numbers fluently within 1,000;** multiplies and divides whole numbers fluently within 100 using previously learned mental strategies, the relationships between addition/subtraction and multiplication/division, and algorithms based on place value; identifies the products of all one-digit numbers from memory. Solves, represents, and explain two-step word problems of various types. Counts to more than 1,000 using number word patterns (e.g., tens, teens) and skip counting; uses skip counting by 2s, 4s, 5s, 6s, 10s, and 100s



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## 0 TO 8 MATH ALIGNMENT

# PROBLEM SOLVING/ REASONING



### **0-6 MONTHS** Cause & Effect

Cries, make noises for attention and food

### **8-12 MONTHS** Cause & Effect Spatial Reasoning

Symbolic play. Bangs toys to make noise. Trying solutions. Imitates solutions of others. Pointing/ vocalizing the word "more".

### **2-3 YEARS** Problem Solving

Learns from prior experience. Recognizes patterns. Begins sharing. More vocal in problem solving.

### **3-4 YEARS** Problem Solving

Develops their own pattern of solving problems. Learning routines and relates time to daily routines and schedules. Developing Independence.

### **KINDERGARTEN** Math Reasoning

Uses mathematical thinking. Able to see more than one solution. Applies abstract math practices. Uses reasoning with symbols. Uses math tools appropriately.

### **FIRST-THIRD GRADE** Math Reasoning

Increased perseverance. Able to do structured math. Understands the need for precision. There's a strong need for play.





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## 0 TO 8 MATH ALIGNMENT

# GEOMETRY



**8 MONTHS** Exploring size and shape. Tracking and moving objects. Hands and mouth.

**1 ½ YEARS** Trial and error. Shape sorting, nesting objects, figuring out how objects fit. Using two hands to pick up a large object and one hand for smaller. Matches two identical shapes. Follows simple directions related to position (in, on, under, up, down)

**3 YEARS** Predicting instead of trial and error. Understanding words to describe size and location of objects in space. Identifies a few basic shapes. Follows simple directions related to proximity (beside, between, next to)

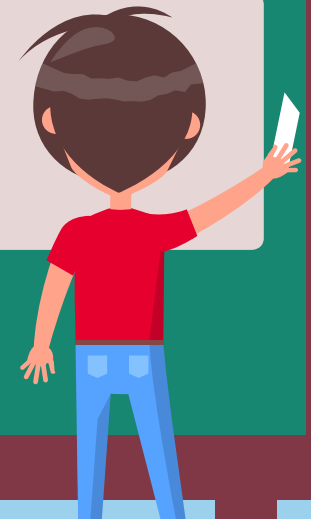
**4 YEARS** Identifies simple 2-3D shapes (circle and square). Uses simple shapes in everyday environment. Use positional words to identify objects in space (in/on, under, up/down, inside/outside). Recognizes basic shapes when they are presented in a new orientation.

**KINDERGARTEN** Describes 3D shapes. Composes simple shapes to form larger/ draw and use objects to build. Name a shape no matter the size or orientation. Analyze and compare 2D & 3D shapes. Uses and responds appropriately to positional words indicating location, direction, and distance.

**FIRST GRADE** Distinguish between defining attributes such as how many sides a shape has. Distinguish between non-defining attributes such as color, orientation, size. Build and draw shapes. Compose two and three dimensional shapes. Partition circles and rectangles into two and four equal shares and describe the shares using halves, fourths and quarters. Describe the whole as two of or four of the shares. Uses and makes simple sketches, models, or pictorial maps to locate objects.

**SECOND GRADE** Recognizes and draws shapes given specific attributes (# of faces, # of angles). Able to partition shapes into equal rows and columns of same size squares. Able to partition rectangles and squares into  $\frac{2}{3}$  equal sections. Recognize shapes by using words – whole, half, thirds, half of, etc. Recognize shares of identical size and shape.

**THIRD GRADE** Understand shapes in different categories may share attributes and that shared attributes can define a larger category. Be able to draw examples and non-examples. Portion shapes into equal areas and express them as fractions of a whole.





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## 0 TO 8 MATH ALIGNMENT

# ALGEBRA & FUNCTIONS



**BIRTH TO 8 MONTHS** Distinguish between familiar and unfamiliar people, places, and objects and explore the difference between them.

**Example:** explore how one toy feels vs another.

**18 MONTHS** Show awareness when objects are in some way **connected** to each other. Match two objects that are the same and organize objects into two groups based on attributes. **Example:** Match 2 identical toys and pick 2 car toys from bin. Shows interest in simple patterns.

**3 YEARS** Group objects into multiple piles based on one attribute at a time. Put similar but not identical items into a group. Copies simple repeating patterns. **Example:** Identify colors when they are named, e.g. "get red ball from bin." Sort primary colored blocks into piles.

**4 YEARS & TK** Begin to sort and classify objects in everyday environment. Recognize simple, repeating patterns. **Example:** Sort or classify by one attribute into two or more groups.

**KINDERGARTEN** Understanding addition. Solve an addition word problem. Add up to 10 using drawings or objects. Understanding subtraction. Decompose numbers less than or equal to 10 into pairs in more than one way. Fluently subtract within 5. Expands understanding of sorting and classifying objects in the environment. Expands understanding of simple repeating patterns. **Example:** Sort or classify by one or more attributes into two or more groups. Recognize and duplicate simple and repeating patterns. Begin to extend and create those patterns.

**FIRST GRADE** Solve word problems with addition of 3 whole numbers whose sum is less than or equal to 20. Use counting strategies to add or subtract within 20. Understand the meaning of the equal sign and determine if adding and subtracting equations are true or false. Apply properties of operations as strategies to add and subtract. Recognizes, creates, and explains more complex repeating and simple growing patterns.

**SECOND GRADE** Represent and solve problems using addition and subtraction. **Example:** Add/subtract within 100 and solve 1 to 2 step problems. Know all sums on 2 from memory. Work with equal groups of objects to gain foundation for multiplication. **Example:** Determine odd/even numbers within group up to 20. Count by 2's. Notices more complex patterns in numbers; identifies the core unit of patterns; represents patterns using numerical and letter symbols.

**THIRD GRADE** Represent and solve problems using multiplication or division. Understand properties of multiplication and the relationship between multiplication and division. Multiply and divide fluently within 100. Solve problems involving the 4 operations and identify and explain patterns in arithmetic. **Example:** If  $6 \times 4 = 24$  then  $4 \times 6 = 24$ . Uses number patterns to count and to solve problems; uses and explains patterns in counting and addition.

