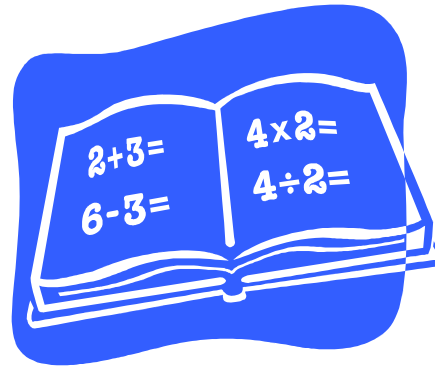


Mathematics Kindergarten



Kindergarten – First Grade Department
SY2009-2010

September Kindergarten Mathematics

Essential Understanding: Students will understand positions of objects in relation to their environment.

Indicators:

G/SS 2 Name and demonstrate the relative position of objects as follows:

- a. place objects over, under, inside, outside, on, beside, between, above, below, on top of, upside-down, behind, in back of, in front of;
- b. describe placement of objects with terms, such as on, inside, outside, above, below, over, under, beside, between, in front of, behind.

NNSO 2 Explain rules of counting, such as each object should be counted once and that order does not change the number.

PFA 1 Sort, classify and order objects by size, number and other properties. For example:

- a. Identify how objects are alike and different.

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Teacher
Use Only

October Kindergarten Mathematics

Essential Understanding: Numbers can be used to count, label, order, identify and describe things and experiences.

Indicators:

NNSO 1 Compare and order whole numbers up to 10.

NNSO 6 Construct multiple sets of objects each containing the same number of objects.

NNSO 4 Determine “how many” in sets (groups) of 10 or fewer objects.

NNSO 5 Relate, read and write numerals for single-digit numbers (0 to 9).

PFA 2 Identify, create, extend and copy sequences of sounds (such as musical notes), shapes (such as buttons, leaves or blocks), motions (such as hops or skips), and numbers from 1 to 10.

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Use Only

November Kindergarten Mathematics

Essential Understanding: Shapes, patterns and numbers are a part of every day life.

Indicators:

NNSO 3 Count to twenty; e.g., in play situations or while reading number books.

G/SS 1 Identify and sort two-dimensional shapes and three-dimensional objects. For example:

- a.** Identify and describe two-dimensional figures and three-dimensional objects from the environment using the child’s own vocabulary.

PFA 4 Model a problem situation using physical materials.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

December Kindergarten Mathematics

Essential Understanding: Shapes can be sorted into groups by characteristics.

Indicators:

G/SS 1 Identify and sort two-dimensional shapes and three-dimensional objects. For example:

- d.** Build two-dimensional figures using paper shapes or tangrams; build simple three-dimensional objects using blocks.

PFA 1 Sort, classify and order objects by size, number and other properties. For example:

- b.** Order three events or objects according to a given attribute, such as time or size.
- c.** Recognize and explain how objects can be classified in more than one way.
- d.** Identify what attribute was used to sort groups of objects that have already been sorted.

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January Kindergarten Mathematics

Essential Understanding: We can sort and measure the same things in different ways.

Indicators:

M 3 Measure length and volume (capacity) using uniform objects in the environment. For example, find:

- a. how many paper clips long is a pencil;
- b. how many small containers it takes to fill one big container using sand, rice, beans.

M 4 Order events based on time. For example:

- a. activities that take a long or short time;
- b. review what we do first, next, last;
- c. recall what we did or plan to do yesterday, today, tomorrow.

G/SS 1 Identify and sort two-dimensional shapes and three-dimensional objects. For example:

- b. Sort shapes and objects into groups based on student-defined categories.
- c. Select all shapes and objects of one type from a group.

DA/P 3 Select the category or categories that have the most or fewest objects in a floor or table graph.

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Teacher
Use Only

February Kindergarten Mathematics

Essential Understanding: Money is an essential aspect of life.

Numbers and objects can be represented as patterns in sequences, sorted by attributes and described with words.

Indicators:

NNSO 9 Identify and state the value of a penny, nickel, and dime.

PFA 3 Describe orally the pattern of a given sequence.

DA/P 2 Arrange objects in a floor or table graph according to attributes, such as use, size, color or shape.

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Teacher
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March Kindergarten Mathematics

Essential Understanding: Numbers can be used and represented in a variety of ways.

Indicators:

NNSO 7 Compare the number of objects in two or more sets when one set has one or two more, or one or two fewer objects.

M 2 Compare and order objects of different lengths, areas, weights, and capacities; and use relative terms, such as longer, shorter, bigger, smaller, heavier, lighter, more and less.

DA/P 1 Gather and sort data in response to questions posed by teachers and students; e.g. how many sisters and brothers, what color shoes.

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April Kindergarten Mathematics

Essential Understanding: Numbers can be represented in parts of the whole.

Indicators:

NNSO 8 Represent and use whole numbers in flexible ways, including relating, composing and decomposing numbers; e.g., 5 marbles can be 2 red and 3 green or 1 red and 4 green.

NNSO 11 Demonstrate joining multiple groups of objects, each containing the same number of objects; e.g., combining 3 bags of candy, each containing 2 pieces.

NNSO 12 Partition or share a small set of objects into groups of equal size; e.g., sharing 6 stickers equally among 3 children.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

May Kindergarten Mathematics

Essential Understanding: Mathematical problems can be solved in more than one way.
Time is measured in various increments.

Indicators:

NNSO 10 Model and represent addition as combining sets and counting on, and subtraction as take-away and comparison. For example:

- a. Combine and separate small sets of objects in contextual situations; e.g., add or subtract one, two, or another small amount.
- b. Count on (forward) and count back (backward) on a number line between 0 and 10

NNSO 13 Recognize the number or quantity or sets up to 5 without counting; e.g., recognize without counting the dot arrangement on a domino as 5.

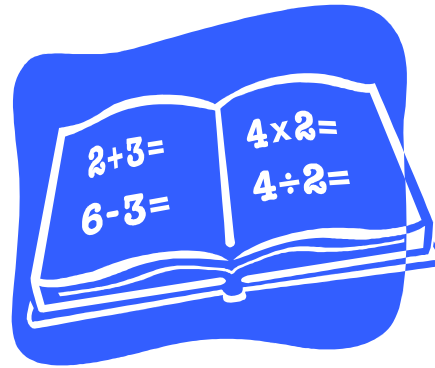
M 1 Identify units of time (day, week, month, year) and compare calendar elements; e.g., weeks are longer than days.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

Mathematics

First Grade



Kindergarten – First Grade Department
SY2009-2010

September Grade 1 Mathematics**Essential Understanding: Numbers can be named in many ways without changing the value of the number.****Indicators:**

NS 2. Recognize and generate equivalent forms for the same number using physical models, words and number expressions; e.g., concept of ten is described by “10 blocks,” full tens frame, numeral 10, $5 + 5$, $15 - 5$, one less than 11, my brother’s age.

NS 10. Model, represent and explain addition as combining sets (part + part = whole) and counting on.

For example:

Model and explain addition using physical materials in contextual situations.

Draw pictures to model addition.

Write number sentences to represent addition.

Explain that adding two whole numbers yields a larger whole number.

NS 12. Use conventional symbols to represent the operations of addition and subtraction.

NS 15. Demonstrate that equal means “the same as” using visual representations.

M 3. Order a sequence of events with respect to time; e.g., summer, fall, winter and spring; morning, afternoon and night.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

October Grade 1 Mathematics

Essential Understanding: Patterns are everywhere in the world. Parts of a whole can be represented with different mathematical forms.

Indicators:

NS 11 Model, represent and explain subtraction as take-away and comparison.

For example:

- a. Model and explain subtraction using physical materials in contextual situations.
- b. Draw pictures to model subtraction.
- c. Write number sentences to represent subtraction.
- d. Explain that subtraction of whole numbers yields an answer smaller than the original number.

NS 12 Use conventional symbols to represent the operations of addition and subtraction.

PFA 1 Sort, classify and order objects by two or more attributes, such as color and shape, and explain how objects were sorted.

PFA 2 Extend sequences of sounds, shapes or simple number patterns, and create and record similar patterns. For example:

- a. Analyze and describe patterns with multiple attributes using numbers and shapes; e.g., AA, B, aa, b, AA, B, aa, b,...
- b. Continue repeating and growing patterns with materials, pictures and geometric items; e.g., XO, XOO, XOOO, XOOOO.

PFA 3 Describe orally the basic unit or general plan of a repeating or growing pattern.

DAP 1 Identify multiple categories for sorting data.

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Teacher
Use Only

November Grade 1 Mathematics

Essential Understanding: Shapes are seen as a part of our everyday lives; they can be described, organized, and compared using their attributes.

Indicators:

- G 1** Identify, compare and sort two-dimensional shapes; i.e., square, circle, ellipse, triangle, rectangle, rhombus, trapezoid, parallelogram, pentagon and hexagon. For example:
- a. Recognize and identify triangles and rhombuses independent of position, shape or size;
 - b. Describe two-dimensional shapes using attributes such as number of sides and number of vertices (corners or angles).
- G 2** Create new shapes by combining or cutting apart existing shapes.
- G 3** Identify the shapes of the faces of three-dimensional objects.
- G 4** Extend the use of location words to include distance (near, far, close to) and directional words (left, right).
- G 5** Copy figures and draw simple two-dimensional shapes from memory.
- DAP 2** Collect and organize data into charts using tally marks.
- DAP 3** Display data in picture graphs with units of 1 and bar graphs with intervals of 1.

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Teacher
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December Grade 1 Mathematics

Essential Understanding: Creating and interpreting charts and graphs are a part of everyday life.

Indicators:

DAP 4 Read and interpret charts, picture graphs and bar graphs as sources of information to identify main ideas, draw conclusions, and make predictions.

DAP 5 Construct a question that can be answered by using information from a graph.

DAP 6 Arrange five objects by an attribute, such as size or weight, and identify the ordinal position of each object.

DAP 7 Answer questions about the number of objects represented in a picture graph, bar graph or table graph; e.g., category with most, how many more in a category compared to another, how many altogether in two categories.

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Teacher
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January Grade 1 Mathematics

Essential Understanding: Money and time are essential parts of our daily lives.

Indicators:

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NS 6 Identify and state the value of a penny, nickel, dime, quarter and dollar.

NS 7 Determine the value of a small collection of coins (with a total value up to one dollar) using 1 or 2 different type coins, including pennies, nickels, dimes and quarters.

NS 8 Show different combinations of coins that have the same value.

M 2 Tell time to the hour and half hour on digital and analog (dial) timepieces.

Teacher
Use Only

February Grade 1 Mathematics**Essential Understanding: Estimation, prediction, counting and measuring are interrelated.****Indicators:**

NS 1 Use ordinal numbers to order objects; e.g., first, second, third.

NS 3 Read and write the numerals for numbers to 100.

NS 4 Count forward to 100, count backwards from 100, and count or backward starting at any number between 1 and 100.

NS 5 Use place value concepts to represent whole numbers using numerals, words, expanded notation and physical models with ones and tens. For example:

- a. Develop a system to group and count by twos, fives and tens.
- b. Identify patterns and groupings in a 100's chart and relate to place value concepts.
- c. Recognize the first digit of a two-digit number as the most important to indicate size of a number and the nearness to 10 or 100.

M 1 Recognize and explain the need for fixed units and tools for measuring length and weight; e.g., rulers and balance scales.

M 4 Estimate and measure weight using non-standard units; e.g., blocks of uniform size.

M 5 Estimate and measure lengths using non-standard and standard units; i.e., centimeters, inches and feet.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

March Grade 1 Mathematics**Essential Understanding:** Mathematical expressions and equations represent relationships among quantities.**Indicators:**

NS 9 Represent commonly used fractions using words and physical models for halves, thirds and fourths, recognizing fractions are represented by equal size parts of a whole and of a set of objects.

NS 16 Develop strategies for basic addition facts, such as:

- a. counting all;
- b. counting on;
- c. one more, two more;
- d. doubles;
- e. doubles plus or minus one;
- f. make ten;
- g. using tens frames;
- h. identity property (adding zero).

NS 17 Develop strategies for basic subtraction facts, such as:

- a. relating to addition (for example, think of $7 - 3 = ?$ as “3 plus ? equals 7”);
- b. one less, two less;
- c. all but one (for example, $8 - 7$, $5 - 4$);
- d. using tens frames;
- e. missing addends.

DAP 8 Describe the likelihood of simple events as possible/impossible and more likely/less likely; e.g., when using spinners or number cubes in classroom activities.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

April Grade 1 Mathematics

Essential Understanding: There are many ways to model, describe orally and solve problems.

Indicators:

PFA 4 Solve open sentences by representing an expression in more than one way using the commutative property; e.g., $4 + 5 = 5 + 4$ or the number of blue balls plus red balls is the same as the number of red balls plus blue balls ($R + B = B + R$).

PFA 5 Describe orally and model a problem situation using words, objects or number phrase or sentence.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

May Grade 1 Mathematics

Essential Understanding: Patterns exist in the natural world and can be represented by numbers.

Indicators:

NS 13 Model and represent multiplication as repeated addition and rectangular arrays in contextual situations; e.g., four people will be at my party and if I want to give 3 balloons to each person, how many balloons will I need to buy?

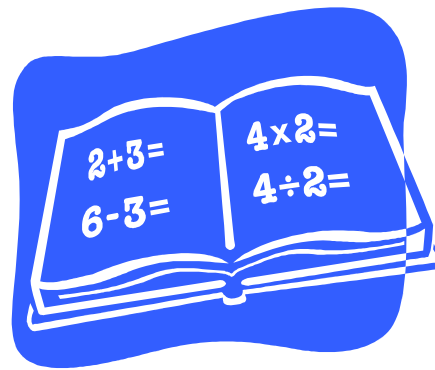
NS 14 Model and represent division as sharing equally in contextual situations; e.g., sharing cookies.

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Teacher
Use Only

Mathematics

Second Grade



Second – Third Grade Department
SY2009-2010

September Grade 2 Mathematics

Essential Understanding: Numbers can be used to count, label, order, identify, measure, and describe things and experiences

Indicators:

NS6 Model, represent and explain subtraction as comparison, take-away and part-to-whole

NS9 Model and use the commutative property for addition.

NS10 Demonstrate fluency in addition facts with addends through 9 and corresponding subtractions; e.g., $9 + 9 = 18$, $18 - 9 = 9$.

PFA4 Use objects, pictures, numbers and other symbols to represent a problem situation.

PFA5 Use symbols to represent unknown quantities and identify values for symbols in an expression or equation using addition and subtraction; e.g., $\square + O = 10$, $\Delta - 2 = 4$.

PFA6 Understand equivalence and extend the concept to situations involving symbols; e.g., $4 + 5 = 9$ and $9 = 4 + 5$, and $4 + 5 = 3 + 6 = \Delta + \square \dots$

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Indicators:

DAP 1. Pose questions, use observations, interviews and surveys to collect data, and organize data in charts, picture graphs and bar graphs.

DAP 2. Read, interpret and make comparisons and predictions from data represented in charts, line plots, picture graphs and bar graphs.

DAP 3. Read and construct simple timelines to sequence events.

DAP 4. Write a few sentences to describe and compare categories of data represented in a chart or graph, and make statements about the data as a whole.

DAP 5. Identify untrue or inappropriate statements about given set of data.

DAP 6. Recognize that data may vary from one population to another; eg., favorite TV shows of students and of parents.

DAP 7. List some of the possible outcomes of a simple experiment, and predict whether given outcomes are more, less or equally likely to occur.
Use physical models and pictures to represent possible arrangements of 2 or 3 objects.

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Teacher
Use Only

November Grade 2 Mathematics

Essential Understanding: Patterns show order in the world and can be found in many different forms.

Indicators:

NS1 Use place value concepts to represent, compare and order whole numbers using physical models, numerals and words, with ones, tens, and hundreds. For example:

- a. Recognize 10 can mean “10 ones” or a single entity (1 ten) through physical models and trading games.

NS2 Recognize and classify numbers as even or odd.

PFA1 Extend simple number patterns (both repeating and growing patterns), and create similar patterns using different objects, such as using physical materials or shapes to represent numerical patterns.

PFA2 Use patterns to make generalizations and predictions; e.g., determine a missing element in a pattern.

Create new patterns with consistent rules or plans, and describe the rule or general plan of existing patterns.

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Teacher
Use Only

Indicators:

NS7 Model, represent and explain multiplication as repeated addition, rectangular arrays and skip counting.

NS11 Add and subtract multiples of 10.

NS12 Demonstrate multiple strategies for adding and 2- or 3-digit whole numbers, such as:

- a. informal use of commutative and associative properties of addition.

NS13 Estimate the results of whole number addition and problems using front-end estimation, and judge the reasonableness of the answers.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

Indicators:

NS5 Represent fractions (halves, thirds, fourths, sixths and eighths), using words, numerals and physical models. For example:

- a. Recognize that a fractional part can mean different amounts depending on the original quantity.
- b. Recognize that a fractional part of a rectangle does not have to be shaded with contiguous parts.
- c. Identify and illustrate parts of a whole and parts of sets of objects.
- d. Compare and order physical models of halves, thirds and fourths in relation to 0 and 1.

GS1 Identify, describe, compare and sort three-dimensional objects (i.e., cubes, spheres, prisms, cones, cylinders and pyramids) according to the shape of the faces or the number of faces, edges or vertices.

GS2 Predict what new shapes will be formed by combining or cutting apart existing shapes.

GS3 Recognize two-dimensional shapes and three-dimensional objects from different positions.

GS4 Identify and determine whether two-dimensional shapes are congruent (same shape and size) or similar (same shape different size) by copying or using superposition (lay one thing on top of another).

Create and identify two-dimensional figures with line symmetry; e.g., what letter shapes, logos, polygons are symmetrical?

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Teacher
Use Only

February Grade 2 Mathematics

Essential Understanding: Mathematical expressions and equations represent relationships among quantities. “Subtraction”

Indicators:

NS8 Model, represent and explain division as sharing equally and repeated subtraction.

NS11 Add and subtract multiples of 10.

NS12 Demonstrate multiple strategies for subtracting 2- or 3-digit whole numbers, such as:

- a. compatible numbers;
- b. compensatory numbers;
- c. informal use of commutative and associative properties of addition.

NS13 Estimate the results of whole number subtraction problems using front-end estimation, and judge the reasonableness of the answers

AUTHENTIC ASSESSMENTS

Teacher
Use Only

March Grade 2 Mathematics

Essential Understanding: The choice of measurement tools depends upon the specific attributes to be measured and the degree of precision required.

Indicators:

NS3 Count money and make change using coins and a dollar bill.

NS4 Represent and write the value of money using the ¢ sign and in decimal form when using the \$ sign.

M1 Identify and select appropriate units of measure for:

d.time – hours, half-hours, quarter-hours or minutes and time designations, a.m. or p.m.

M4 Tell time to the nearest minute interval on digital and to the nearest five minute interval on analog (dial) timepieces.

M7 Describe qualitative and quantitative changes, especially those involving addition and subtraction; e.g., a student growing taller versus a student growing two inches in one year.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

April Grade 2 Mathematics

Essential Understanding: The choice of measurement tools depends upon the specific attributes to be measured and the degree of precision required.

M1 Identify and select appropriate units of measure for:

- a. length – centimeters, meters, inches, feet or yards;
- b. volume (capacity) – liters, cups, pints or quarts;
- c. weight – grams, ounces or pounds;

M2 Establish personal or common referents for units of measure to make estimates and comparisons; e.g., the width of a finger is a centimeter, a large bottle of soda pop is 2 liters, a small paper clip weighs about one gram.

M3 Describe and compare the relationships among units of measure, such as centimeters and meters; inches, feet and yards; cups, pints and quarts; ounces and pounds; and hours, half-hours, and quarter-hours; e.g., how many inches in a foot?

M5 Estimate and measure the length and weight of common objects, using metric and U.S. customary units, accurate to the nearest unit.

M6 Select and use appropriate measurement tools; e.g., a ruler to draw a segment 3 inches long, a measuring cup to place 2 cups of rice in a bowl, a scale to weigh 50 grams of candy.

M7 Make and test predictions about measurements, using different units to measure the same length or volume.

AUTHENTIC ASSESSMENTS

Teacher
Use Only

May Grade 2 Mathematics

Essential Understanding: Strategies for computations are based upon place value concepts

Indicators:

NS1 Use place value concepts to represent, compare and order whole numbers using physical models, numerals and words, with ones, tens, and hundreds.

- a. Recognize 10 can mean “10 ones” or a single entity (1 ten) through physical models and trading games.

- b. Read and write 3-digit numerals (e.g., 243 as two hundred forty three, 24 tens and 3 ones, or 2 hundreds and 43 ones, etc.) and construct models to represent each.

NS12 Demonstrate multiple strategies for adding and 2- or 3-digit whole numbers, such as:

- a. compatible numbers;
- b. compensatory numbers;

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