OHIO DEPARTMENT OF EDUCATION
ACADEMIC CONTENT STANDARDS
MATHEMATICS CHECKLIST
~KINDERGARTEN~

Number, Number Sense and Operations Standard—Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another. Students compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.

Benchmark A: *Use place value concepts to represent whole numbers using numerals, words and physical models.*

Benchmark B: *Recognize, classify, compare and order whole numbers.*

Benchmark C: *Represent commonly used fractions using words and physical models.*

Benchmark D: *Determine the value of a collection of coins and dollar bills.*

Benchmark E: *Make change using coins for values up to one dollar.*

Benchmark F: *Count, using numerals and ordinal numbers.*

Benchmark G: *Model, represent and explain addition as combining sets and counting on.*

Benchmark H: *Model, represent and explain subtraction as comparison, take-away and part-to-whole.*

Benchmark I: *Model, represent and explain multiplication as repeated addition, rectangular arrays and skip counting.*

Benchmark J: *Model, represent and explain division as sharing equally, repeated subtraction and rectangular arrays.*

Benchmark K: *Demonstrate fluency in addition facts with addends through 9and corresponding subtractions.*

Benchmark L: *Demonstrate fluency in adding and subtracting multiples of 10, and recognize combinations that make 10.*

Benchmark M: *Add and subtract two-digit numbers with and without regrouping.*

____1. Compare and order whole numbers up to 10.
____2. Explain rules of counting, such as each object should be counted once and that order does not change the number.
____3. Count to twenty; e.g., in play situations or while reading number books.
____4. Determine "how many" in sets (groups) of 10 or fewer objects.
____5. Relate, read and write numerals for single-digit numbers (0 to 9).
____6. Construct multiple sets of objects each containing the same number of objects.
____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.
____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.
____9. Identify and state the value of a penny, nickel and dime.
____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.
____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.
____12. Partition or share a small set of objects into groups of equal size; e.g., sharing 6 stickers equally among 3 children.
____13. Recognize the number or quantity of sets up to 5 without counting; e.g., recognize without counting the dot arrangement on a domino as 5.

Measurement Standard—Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.

Benchmark A: *Explain the need for standard units of measure.*

Benchmark B: *Select appropriate units for length, weight, volume (capacity) and time, using:*
- *objects; i.e., non-standard units;*
- *U.S. customary units: inch, foot, yard, ounce, pound, cup, quart, gallon, minute, hour, day, week and year;*
- *metric units: centimeter, meter, gram and liter.*

Benchmark C: *Develop common referents for units of measure for length, weight, volume (capacity) and time to make comparisons and estimates.*

Benchmark D: *Apply measurement techniques to measure length, weight and volume (capacity).*

Benchmark E: *Recognize that using different units of measurement will yield different numbers for the same measurement.*

____1. Identify units of time (day, week, month, year) and compare calendar elements; e.g., weeks are longer than days.
____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.
____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.
____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.

Geometry and Spatial Sense Standard—

Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two-, and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects and transformations to analyze mathematical situations and solve problems.

Benchmark A: *Describe and create plane figures: circle, rectangle, square, triangle, hexagon, trapezoid, parallelogram and rhombus, and identify them in the environment.*

Benchmark B: *Describe solid objects: cube, rectangular prism, sphere, cylinder, cone and pyramid, and identify them in the environment.*

Benchmark C: *Sort and compare two-dimensional figures and three-dimensional objects according to their characteristics and properties.*

Benchmark D: *Identify, explain and model (superposition, copying) the concept of shapes being congruent and similar.*

Benchmark E: *Recognize two- and three-dimensional objects from different positions.*

Benchmark F: *Describe location, using comparative (before, after), directional (above, below), and positional (first, last) words.*

Benchmark G: *Identify and draw figures with line symmetry.*

____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.
b. Sort shapes and objects into groups based on student-defined categories.
c. Select all shapes or objects of one type from a group.
d. Build two-dimensional figures using paper shapes or tangrams; build simple three-dimensional objects using blocks.

____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.

Patterns, Functions and Algebra Standard—

Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities. Students analyze, model and solve problems using various representations such as tables, graphs and equations.

Benchmark A: Sort, classify and order objects by size, number and other properties, and describe the attributes used.

Benchmark B: Extend sequences of sounds and shapes or simple number patterns, and create and record similar patterns.

Benchmark C: Create and extend patterns, and describe the rule in words.

Benchmark D: Model problem situations, using objects, pictures, numbers and other symbols.

Benchmark E: Solve open sentences and explain strategies.

Benchmark F: Represent an unknown quantity as a variable using a symbol, such as □, Δ, O.

Benchmark G: Describe and compare qualitative and quantitative changes.

____1. Sort, classify and order objects by size, number and other properties. For example:
a. Identify how objects are alike and different.
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.

____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.

____3. Describe orally the pattern of a given sequence.

____4. Model a problem situation using physical materials.

Data Analysis and Probability Standard—

Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.

Benchmark A: *Pose questions and gather data about everyday situations and familiar objects.*

Benchmark B: *Sort and classify objects by attributes, and organize data into categories in a simple table or chart.*

Benchmark C: *Represent data using objects, picture graphs and bar graphs.*

Benchmark D: *Describe the probability of chance events as more, less or equally likely to occur.*

____1. Gather and sort data in response to questions posed by teacher and students; e.g., how many sisters and brothers, what color shoes.

____2. Arrange objects in a floor or table graph according to attributes, such as use, size, color or shape.

____3. Select the category or categories that have the most or fewest objects in a floor or table graph.

<u>Mathematical Processes Standard</u>—Students use mathematical processes and knowledge to solve problems. Students apply problem-solving and decision-making techniques, and communicate mathematical ideas.

The benchmarks for mathematical processes articulate what students should demonstrate in problem solving, representation, communication, reasoning and connections at key points in their mathematics program. Specific grade-level indicators have not been included for the mathematical processes standard because content and processes should be interconnected at the indicator level. Therefore, mathematical processes have been embedded within the grade level indicators for the five content standards.

Benchmark A: *Use a variety of strategies to understand problem situations; e.g., discussing with peers, stating problems in own words, modeling problems with diagrams or physical materials, identifying a pattern.*

Benchmark B: *Identify and restate in own words the question or problem and the information needed to solve the problem.*

Benchmark C: *Generate alternative strategies to solve problems.*

Benchmark D: *Evaluate the reasonableness of predictions, estimations and solutions.*

Benchmark E: *Explain to others how a problem was solved.*

Benchmark F: *Draw pictures and use physical models to represent problem situations and solutions.*

Benchmark G: *Use invented and conventional symbols and common language to describe a problem situation and solution.*

Benchmark H: *Recognize the mathematical meaning of common words and phrases, and relate everyday language to mathematical language and symbols.*

Benchmark I: *Communicate mathematical thinking by using everyday language and appropriate mathematical language.*