

ISPS Math Standards & Benchmarks

(Adapted from AERO standards)

Kindergarten

(Revised Oct 2009)

Process Standards

1. Problem Solving
2. Reasoning, Proof, and Connection
3. Communication and Representation
4. Technology

Strands

1. Number Sense
2. Measurement and Geometry
3. Algebra
4. Data Analysis and Probability

Process Standards

Problem Solving:

Standard 1 - Students will apply a wide variety of mathematical concepts, processes, and skills to solve a broad range of problems in various content areas and everyday situations.

Benchmarks - By the end of Kindergarten, students will:

- 1 – 1 Formulate a problem, determine information required to solve the problem choose methods for obtaining this information, and set limits for acceptable solutions.
- 1 – 2 Demonstrate that there may be multiple ways to solve a problem and explain why this is so.
- 1 – 3 Understand that there is no one right way to solve mathematical problems but that different methods (e.g., working backward from a solution, using a similar problem type, identifying a pattern) have different advantages and disadvantages.
- 1 – 4 Transfer strategies from a prior problem to a new situation.
- 1 – 5 Verify the correctness and reasonableness of simple mathematical results.

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Reasoning, Proof and Connection:

Standard 2 - Students will apply mathematical reasoning skills to investigate, evaluate, justify, and connect approaches and solutions to situations in mathematics and in other disciplines.

Benchmarks - By the end of Kindergarten, students will:

- 2 – 1 Make, check, and verify predictions about the quantity, size, and shape of objects and groups of objects.
- 2 – 2 Explain why a prediction, estimation, or solution is reasonable.
- 2 – 3 Make and describe connections linking conceptual and procedural knowledge using a variety of strategies (manipulative, pictorial, symbolic).

Communication and Representation:

Standard 3 - Students will understand mathematical information presented and obtained in a variety of ways and will accurately and clearly present and justify mathematical ideas in diverse formats.

Benchmarks - By the end of Kindergarten, students will:

- 3 – 1 Listen to and read about mathematical strategies and solutions, and communicate them to others using everyday language and correct mathematical terms (e.g., sum, and symbols (e.g., +, =)).
- 3 – 2 Recognize that certain words give clues to specific operations (e.g., sum means addition, difference means subtraction).
- 3 – 3 Communicate mathematical ideas using concrete, pictorial and symbolic representations.
- 3 – 4 Understand and demonstrate that some ways of representing a problem are more helpful than others.

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Technology:

Standard 4 - Students will select and use a wide variety of tools and technology to support and validate mathematical results, when appropriate.

Benchmarks - By the end of Kindergarten, students will:

4 – 1 Represent and examine mathematical situations using manipulatives.

STRAND1- NUMBER SENSE and OPERATIONS

Standard 5 - Students will understand and apply numbers, ways of representing numbers, relationships among numbers, and number systems.

Benchmarks - By the end of Kindergarten, students will:

5 – 1 Connect physical, verbal, and symbolic representations of whole numbers to 20.

5 – 2 Use drawings, diagrams, and models to show the concept of fractions as part of a whole and part of a set.

5 – 3 Explain how numbers are used in various ways, including counting, ordering, representing quantities, measuring and labeling to 20

5 – 4 Knows the common language for comparing quantities to 20 (such as more than and less than).

5 – 5 Explain the connections between operation (e.g) addition and subtraction.

5 – 6 Use concrete objects to count, order, group, and demonstrate one-to-one correspondence with whole numbers to 20

5 – 7 Identify patterns in number sequences (identify even and odd numbers, count by 5s, 10s)

5 – 8 Read, write, and order numbers to 20.

Standard 6 - Students will estimate, compute, and assess reasonableness of solutions.

Benchmarks - By the end of Kindergarten, students will:

6-1 Add and subtract single- and two-digit whole numbers.

6-2 Apply addition and subtraction in a variety of situations (such as working out a problem based question) to 20.

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- 6-3 Understand and appropriately use the vocabulary of estimation (such as, between, less than, more than)
- 6-4 Use a estimation skills to find solutions.
- 6-5 Determine the value of a set of host country currency and U.S. currency (using 1s, 2s, 5s).

STRAND 2- MEASUREMENT and GEOMETRY

Standard 7 - Students will estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools, and technologies.

Benchmarks - By the end of Kindergarten, students will:

- 7 – 1 Estimate before measuring to determine the reasonableness of a solution using non-standard units.
- 7 – 2 Estimate and measure length, capacity and mass to the nearest unit using nonstandard measurement.
- 7 – 3 Compare and order measurable characteristics (for example, time, , length, mass, capacity,) of different objects on the same dimensions.
- 7 – 4 Tell time to the hour and half hour

Standard 8 - Students will use spatial reasoning and apply the properties and relationships of geometric figures to represent, investigate, analyze, and solve problems.

Benchmarks - By the end of Kindergarten, students will:

- 8– 1 Use comparative directional and positional words (such before, between, after, left, right, above).
- 8– 2 name, geometric two- and three-dimensional shapes).(circle, square, rectangle, triangle, hexagon cube, sphere, and cone),
- 8 – 4 Identify and describe geometric figures in the environment.
- 8 – 5 Order simple geometric figures by size.

STRAND 3- ALGEBRA

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Standard 9 - Students will use algebraic methods to represent, analyze, and solve abstract and practical mathematical situations involving patterns and functional relationships.

Benchmarks - By the end of Kindergarten, students will:

- 9 – 1 Recognize, reproduce, create, and describe repeating patterns and sequences using color, shape, movement and sound.
- 9-2 Generate and solve simple functions by identifying patterns.
- 9-3 Generate, write, and solve open sentences using informal methods (such as using manipulatives, drawing, or acting out the solution).

STRAND 4- DATA ANALYSIS and PROBABILITY

Standard 10 - Students will pose a question, collect, organize, analyze, and represent data in order to make decisions and predictions.

Benchmarks – By the end of Kindergarten, students will:

- 10 – 1 Pose a question and collect data by observing, measuring, surveying, and counting.
- 10 – 2 Construct, read, interpret, and label graphs pictographs and simple bar charts.
- 10 – 3 Interpret data by looking for patterns and relationships (such as most, least and same).