

## ICS Lower Elementary Math Standards

Adopted from NCTM

### Numbers and Operations Standards

#### **N1. Understand numbers, ways of representing numbers, relationships among numbers, and number systems**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
N1a. Count with understanding and recognize "how many" in sets of objects				
N1b. Use multiple models to develop initial understandings of place value and the base-ten number system				
N1c. Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and their connections				
N1d. Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers				
N1e. Connect number words and numerals to the quantities they represent, using various physical models and representations				
N1f. Understand and represent commonly used fractions, such as $\frac{1}{4}$ , $\frac{1}{3}$ , and $\frac{1}{2}$				

**N2. Understand meanings of operations and how they relate to one another**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
N2a. Understand various meanings of addition and subtraction of whole numbers and the relationship between the two operations				
N2b. Understand the effects of adding and subtracting whole numbers				
N2c. Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally				

**N3. Compute fluently and make reasonable estimates**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
N3a. Develop and use strategies for whole-number computations, with a focus on addition and subtraction				
N3b. Develop fluency with basic number combinations for addition and subtraction				
N3c. Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculators				

**Algebra Standards****A1. Understand patterns, relations, and functions**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
A1a. Sort, classify, and order objects by size, number, and other properties				
A1b. Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another				
A1c. Analyze how both repeating and growing (number) patterns are generated				

**A2. Represent and analyze mathematical situations and structures using algebraic symbols**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
A2a. Illustrate general principles and properties of operations, such as commutativity, using specific numbers				
A2b. Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations				

**A3. Use mathematical models to represent and understand quantitative relationships**

Benchmark	K3/K4	Kindergarten	Grade 1	Grade 2
A3a. Model situations that involve the addition and subtraction of whole numbers, using objects, pictures, and symbols				

**A4. Analyze change in various contexts**

Benchmark	K3/K4	Kindergarten	Grade 1	Grade 2
A4a. Describe qualitative change, such as a student's growing taller				
A4b. Describe quantitative change, such as a student's growing two inches in one year				

**Geometry Standards****G1. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships**

Benchmark	K3/K4	Kindergarten	Grade 1	Grade 2
G1a. Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes				

G1b. Describe attributes and parts of two- and three-dimensional shapes				
G1c. Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes				

### **G2. Specify locations and describe spatial relationships using coordinate geometry and other representational systems**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
G2a. Describe, name, and interpret relative positions in space and apply ideas about relative position				
G2b. Describe, name, and interpret direction and distance in navigating space and apply ideas about direction and distance				
G2c. Find and name locations with simple relationships such as "near to" and in coordinate systems such as maps				

### **G3. Apply transformations and use symmetry to analyze mathematical situations**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
G3a. Recognize and apply slides, flips, and turns				
G3b. Recognize and create shapes that have symmetry				

**G4. Use visualization, spatial reasoning, and geometric modeling to solve problems**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
G4a. Create mental images of geometric shapes using spatial memory and spatial visualization				
G4b. Recognize and represent shapes from different perspectives				
G4c. Relate ideas in geometry to ideas in number and measurement				
G4d. Recognize geometric shapes and structures in the environment and specify their location				

**Measurement Standards****M1. Understand measurable attributes of objects and the units, systems, and processes of measurement**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
M1a. Recognize the attributes of length, volume, weight, area, and time				
M1b. Compare and order objects according to these attributes				
M1c. Understand how to measure using nonstandard and standard units				
M1d. Select an appropriate unit and tool for the attribute being measured				

**M2. Apply appropriate techniques, tools, and formulas to determine measurements**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
M2a. Measure with multiple copies of units of the same size, such as paper clips laid end to end				
M2b. Use repetition of a single unit to measure something larger than the unit, for instance, measuring the length of a room with a single meterstick				
M2c. Use tools to measure				
M1d. Develop common referents for measures to make comparisons and estimates				

**Data Analysis and Probability Standards**

**DP1. Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
DP1a. Pose questions and gather data about themselves and their surroundings				

DP1b. Sort and classify objects according to their attributes and organize data about the objects				
DP1c. Represent data using concrete objects, pictures, and graphs				

**DP2. Select and use appropriate statistical methods to analyze data**

Benchmark	K3/K4	Kindergarten	Grade 1	Grade 2
DP2a. Describe parts of the data and the set of data as a whole to determine what the data show				

**DP3. Develop and evaluate inferences and predictions that are based on data**

Benchmark	K3/K4	Kindergarten	Grade 1	Grade 2
DP3a. Discuss events related to students' experiences as likely or unlikely				

**DP4. Understand and apply basic concepts of probability**

**Mathematical Process Standards****P1. Develop and use problem solving skills**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
P1a. Build new mathematical knowledge through problem solving				
P1b. Solve problems that arise in mathematics and in other contexts				
P1c. Apply and adapt a variety of appropriate strategies to solve problems				
P1d. Monitor and reflect on the process of mathematical problem solving				

**P2. Develop and use mathematical reasoning and proof**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
P2a. Recognize reasoning and proof as fundamental aspects of mathematics				
P2b. Make and investigate mathematical conjectures				
P2c. Develop and evaluate mathematical arguments and proofs				
P2d. Select and use various types of reasoning and methods of proof				

**P3. Communicate mathematical thinking clearly**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
P3a. Organize and consolidate their mathematical thinking through communication				
P3b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others				
P3c. Analyze and evaluate the mathematical thinking and strategies of others				
P3d. Use the language of mathematics to express mathematical ideas precisely				

**P4. Connect mathematical ideas inside and outside of mathematical contexts**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
P4a. Recognize and use connections among mathematical ideas				
P4b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole				
P4c. Recognize and apply mathematics in contexts outside of mathematics				

**P5. Represent mathematical ideas clearly**

<b>Benchmark</b>	<b>K3/K4</b>	<b>Kindergarten</b>	<b>Grade 1</b>	<b>Grade 2</b>
P5a. Create and use representations to organize, record, and communicate mathematical ideas				
P5b. Select, apply, and translate among mathematical representations to solve problems				
P5c. Use representations to model and interpret physical, social, and mathematical phenomena				

