

# Investigations in Data, Number, and Space

## Math Curriculum

### Unit Topics 2001-2002

## Junior First Grade

### Counting Ourselves and Others (Exploring Data)

- Developing and using strategies for counting and comparing quantities
- Exploring and using one-to-one and two-to-one correspondence
- Collecting, recording, and representing data in a variety of ways
- Looking at and discussing different representations of the same data set
- Finding different ways to sort and classify a group of objects by attributes
- Solving mathematical problems based on data

### Making Shapes and Building Blocks (Exploring Geometry)

- Developing vocabulary to name and describe 2-D and 3-D shapes and their attributes
- Relating 2-D and 3-D shapes to real-world objects
- Exploring relationships among shapes or to fill an area
- Exploring 2-D shapes using the *Shapes* software

### How Many in All? (Counting and the Number System)

- Developing and using strategies to count and compare quantities
- Using pictures, number, or words to record solutions to a problem, to represent quantities, and to record number combinations
- Repeating a nonstandard unit (e.g., a craft stick) to quantify length (e.g., 3 sticks long)
- Recording and representing measurements with pictures, numbers, and words
- Becoming familiar with combinations of numbers up to about 8
- Making sense of story problems that involve combining and separating by acting them out and retelling them
- Developing strategies for solving combining and separating story problems

## **MATHEMATICAL EMPHASIS IN JUNIOR FIRST GRADE BY UNIT**

### **Counting Ourselves and Others (Exploring Data)**

Students count to collect data about themselves, their classmates, and their environment. They sort and classify objects, first as *same* or *different*, and then into categories based on common attributes. These experiences help students organize their data when they represent the information through pictures, graphs, and physical models. Finally, students solve a mathematical problem based on attendance data.

### **Mathematical Emphases**

- Developing and using strategies for counting
- Relating counting to the quantity of items in a group
- Exploring and using one-to-one correspondence
- Exploring two-to-one correspondence
- Comparing the size of different groups
- Collecting data
- Recording and representing data
- Looking at different representations of the same data set
- Observing and describing attributes
- Sorting and classify objects by attributes
- Composing survey questions
- Making sense of data representation (explaining, interpreting, presenting)
- Solving a mathematical problem based on data

### **Making Shapes and Building Blocks (Exploring Geometry)**

Students use pattern blocks, Geoblocks, clay, and the *Shapes* software as they observe, describe, construct, and represent 2-D and 3-D shapes. Through pattern block puzzles, block structures, and a game called Fill the Hexagon, students explore how shapes can be combined to make other shapes. They investigate the relationship between 2-D and 3-D as they match Geoblocks to 2-D outlines of the block faces.

### **Mathematical Emphases**

- Recognizing shapes in the environment
- Observing and describing two- and three- dimensional (2-D and 3-D) shapes
- Developing vocabulary to describe and name 2-D and 3-D shapes
- Becoming familiar with the names of 2-D and 3-D shapes
- Relating 2-D and 3-D shapes to real-world objects
- Using shapes to make or design a picture

- Make a 2-D representation
- Putting shapes together to make other shapes
- Finding combinations of shapes that fill an area
- Building knowledge about the relationships among pattern block shapes
- Exploring 2-D shapes using the *Shapes* software
- Visualizing which shape to select to fill in a design
- Visualizing how a shape needs to be moved or turned in order to fit into a particular shape or design
- Relating a 3-D object to a 2-D picture of its geometric shape
- Observing and describing attributes of 2-D and 3-D shapes
- Constructing 2-D shapes
- Combining smaller 3-D shapes to make a larger 3-D shape
- Analyzing visual images
- Describing the position of and spatial relationships among objects
- Looking at 3-D objects as wholes and as having parts
- Observing similarities and differences between the faces of 3-D shapes
- Matching a 3-D block to a 2-D outline of one of the block faces
- Using the *Shapes* software to replicate a pattern block design or picture

### **How Many in All? (Counting and the Number System)**

Students play mathematical games in which they count, combine, and compare amounts; solve problems involving number combinations (e.g. 6 is a 3 and 3, or 2 and 3 and 1); count quantities as they use objects to measure length and distance; use their growing understanding of numbers to solve addition and subtraction story problems; and explore different ways to represent quantities with manipulatives, numerals, and pictures.

### **Mathematical Emphases**

- Counting up to about 20 objects
- Using pictures, numbers, or words to record solutions to a problem, to represent quantities, and to record number combinations
- Repeating a nonstandard unit (e.g. a craft stick) to quantify length (e.g., 3 sticks long)
- Recording and representing measurements with pictures, numbers, and words
- Describing lengths that fall between two whole numbers (e.g. lengths between 3 and 4)
- Keeping track of the size of a growing collection of objects
- Becoming familiar with combinations of numbers up to about 8
- Recording strategies for counting 6 things grouped in different ways
- Determining the larger of two amounts, up to about 20
- Exploring different ways to arrange a set of 6 objects
- Using numbers to describe arrangements of objects and to record how many
- Describing position of and spatial relationships among objects
- Developing strategies for solving combining and separating story problems
- Finding the total of two or more single-digit numbers
- Using objects to model number combinations
- Making sense of stories that involve combining and separating by acting them