

## Mathematical Emphasis

### **Investigation 1 - Composing and Decomposing Shapes**

- Sorting, describing, and identifying shapes by various attributes
- Composing and decomposing two- and three-dimensional shapes
- Describing spatial and numerical relationships found among shapes

### **Investigation 2 - What is a Rectangle?**

- Identifying triangles and rectangles based on the number of sides, the number of corners, and the number of square corners
- Visualizing, constructing, and drawing rectangular arrays
- Using numbers to compare rectangular arrays

### **Investigation 3 - Fractions of Geometric Shapes**

- Constructing arrays to represent numbers and identifying halves of the arrays
- Investigating halves of three-dimensional solids
- Constructing two-dimensional arrays that are divided into thirds and fourths
- Describing fractional parts of an array as fractions of a rectangular region
- Describing fractional parts of an array as fractions of the set of tiles used to construct the array
- Designing and constructing a rectangular region that is divided into halves, thirds, or fourths

### **Investigation 4 - Symmetry**

- Finding and describing objects that have mirror symmetry
- Making two-dimensional symmetrical designs
- Building three-dimensional symmetrical structures.

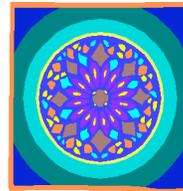
## **Tips for Helping at Home**

- Questions to ask:
  - What is it that you don't understand (have the student be specific)?
  - What information do you need?
  - What strategies are you going to use?
  - Can you guess and check?
  - Does this make sense?
  - What can you do to explain your answer to show others what you are thinking?
  - Does your answer seem reasonable?

- Look for different shapes in the environment. Where do you see rectangles and squares? Are there some shapes within other shapes, such as panes in a window?



- Look for arrays - for example, in floor tiles, calendars, and window panes.
- Look for patterns in fabric, wallpaper, flags, or other places that are half one color and half another. How can your child tell that the patterns are half and half?
- Look for designs that are symmetrical.



- Have fun exploring these ideas with your child!

## **GAME Turn Over 10**

- Materials: One deck of Number Cards 0 - 10 (four of each) plus four wild cards

- Players: 2 to 3

- How to play:

1. Arrange the cards face down in four rows of five cards. Place the rest of the deck face down in a pile.

2. Take turns. On a turn, turn over one card then another. A wild card can be made into any number.

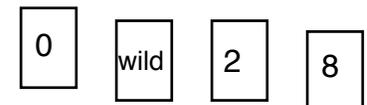
\*If the total is more than 10, your turn is over and the cards are turned face down in the same place.

\*If the total is 10, take the cards and replace them with cards from the deck. You get another turn.

3. Place each of your card combinations of 10 in separate piles so they don't get mixed up.

4. The game is over when no more 10's can be made.

5. At the end of the game, make a list of the number combinations for 10 that you made.

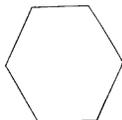


## Vocabulary for Parents

**Symmetry** - an object is symmetrical when one side is a mirror image of the other



**Hexagon** - a shape with six sides



**Trapezoid** - a four sided shape with one pair of parallel sides



**Rhombus** - a shape with four equal sides



**Triangle** - a shape with three sides.



**Array** - a set of objects usually arranged in rows and columns



### Web Sites

<http://www.investigations.scottforesman.com/pdfs/parentpage.pdf>

<http://www.everett.k12.wa.us/math/Second%20Grade>

<http://www.amathsdictionaryforkids.com/>

## About the Mathematics In This Unit

For the next few weeks we will be investigating geometry and fractions. We will investigate relationships among shapes and put shapes together to build other shapes. For example, children will be using pattern blocks (two dimensional shapes) to make a hexagon shape by combining two trapezoids or by combining six triangles. Children will look for ways that a large design can be covered with different numbers of blocks.

We will also investigate rectangular arrays. Checkerboards and floor tiles are arrays that are familiar to many children. An egg carton is a 2-by-6 array. Activities with arrays provide experiences with fractions and area.

Children will build arrays with square tiles, then draw them. They will compare all the arrays that can be built for a number such as 12. Later in the unit we will use rectangular arrays to show fractions. Each child will design a Fraction Flag that is divided into equal parts.

The last part of this unit is about symmetry. Students will make symmetrical designs with pattern blocks and investigate symmetry using a mirror. These activities, as well as others in this unit, help children develop visual thinking.



Economopoulos, K. Investigations in Number, Data and Space: Coins, Coupons, and Combinations.

Dale Seymour Publications, 1998



## Shapes, Halves and Symmetry

### Grade 2

Geometry and Fractions



State College Area School District