

# SQUARE FOLDS

*Wayne R. Scott  
Genesee Intermediate School District  
Flint, MI 48507*

Paper folding can be a unique means of developing both spatial visualization and problem solving. Activities to assist students in developing spatial visualization are not commonly incorporated in the curriculum, and with the advent of television the amount of time children spend playing with blocks and tinker toys has declined significantly. In the past, boys spent more time with these types of toys and developed much more skill with visual perception than girls did. The following activities can be used to help develop spatial visualization abilities.

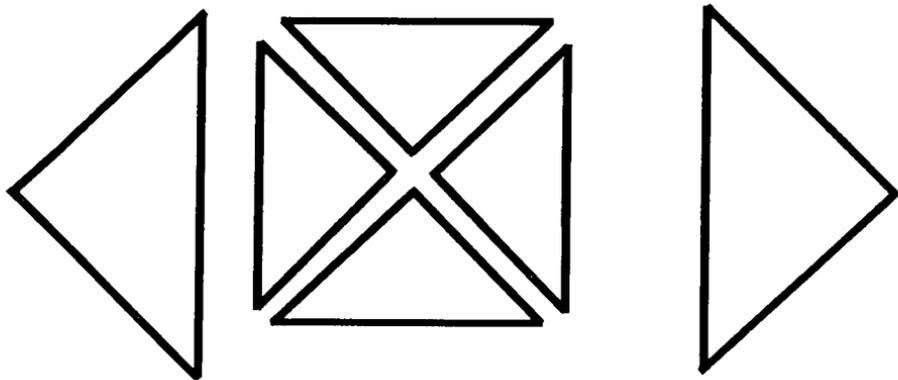
There are two types of activities which follow. In each it is necessary to have a supply of square pieces of paper. Each activity requires a new square piece of paper.

Good luck!

(FOLD ONE SQUARE TO OBTAIN THE SHAPES IN EACH OF THESE ACTIVITIES)

## **Activity 1** (one square)

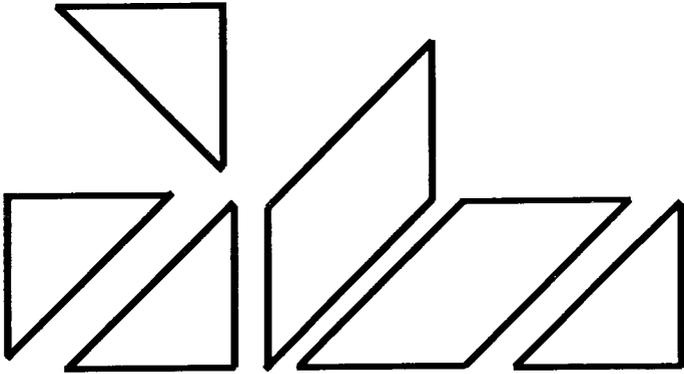
Fold and get these shapes – four small triangles and two large triangles. Do not open the paper between folds.



Write the fraction name on each piece.

### Activity 2

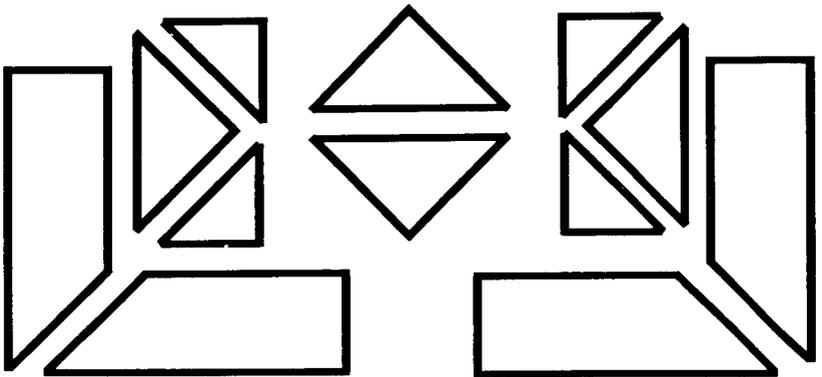
Fold a new square to obtain these four triangles and two parallelograms. Do not open the paper between folds.



Write the fraction name on each piece.

### Activity 3

Fold a square to obtain four small triangles, four large triangles and four trapezoids. Do not open the paper between folds.



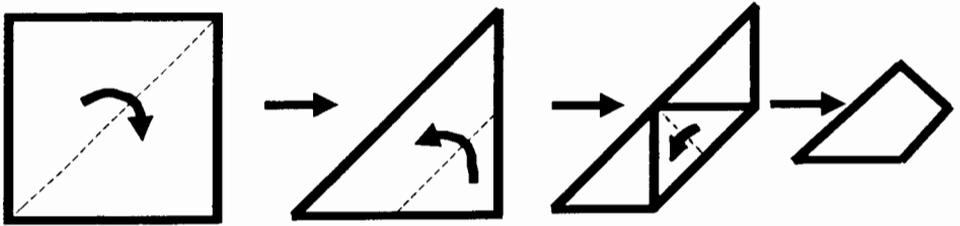
Write the fraction name on each piece.

In the previous activities it was necessary to visualize how to fold a square to obtain the desired shapes. In the following activities the folding procedure is given and it is necessary to visualize the resulting creases in the square piece of paper.

(IN EACH OF THESE ACTIVITIES FIRST DRAW LINES ON THE SQUARE WHERE THE CREASES WILL OCCUR. THEN FOLD THE SQUARE TO CHECK YOUR SOLUTION.)

**Activity 4**

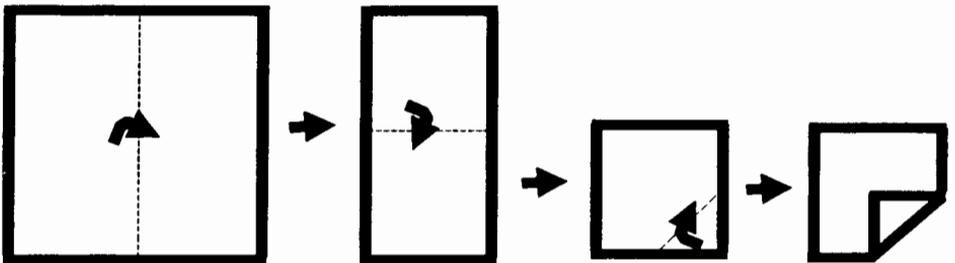
Draw the creases and then check by folding.



Write the fraction names on each piece.

**Activity 5**

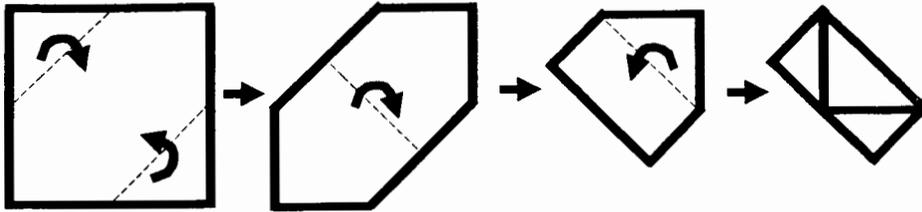
Draw the creases and then check by folding.



Write the fraction names on each piece.

**Activity 6**

Draw the creases and then check by folding.

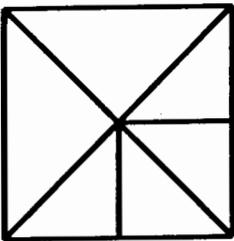


(Fold to the center)

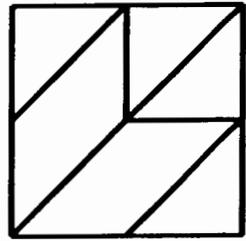
Write the fraction names on each piece.

**SOLUTIONS:**

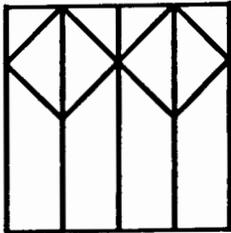
**Activity 1**



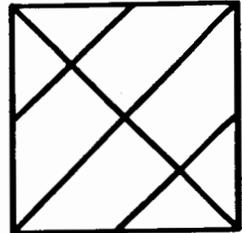
**Activity 2**



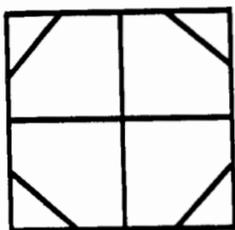
**Activity 3**



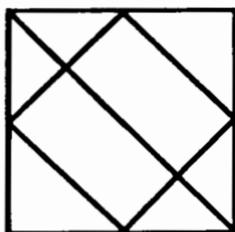
**Activity 4**



### Activity 5



### Activity 6



Reference

Huellmantel, P., C. Schloff, and W. Scott. *Shapes In a Square: Visual Thinking Activities Through Paperfolding*. Sunnyvale, CA: Creative Publications, 1989.

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## GRANTS

### The Ohio Problem Solving Consortium

The OHIO PROBLEM SOLVING CONSORTIUM is busy at work producing problem solving lessons and problems that teachers in grades K-8 can use. These classroom-ready lessons were written by 28 teachers from Southwest Ohio area schools and have been pilot-tested and revised. Two booklets of grade-specific problem solving lessons are available (*Problems for Early Primary* and *Problems for Middle School*) and cover a wide range of problem solving strategies. Additionally, four strategy-specific booklets are available: *Working Backwards*, *Guess and Check*, *Elimination*, and *Make A Table*. Each of these contains lots of problem solving exercises for students in grades K-8. Exercises are keyed to both grade-level and mathematics content. Also, a *Teachers Resource Manual* is available and contains teaching suggestions for each of the major problem solving strategies, reprinted readings from the *Arithmetic Teacher*, and summaries of the NCTM Standards related to problem solving.

While these resources are free while supplies last, a \$10 mailing and handling fee is charged (make check to Miami University). Write to Dr. Jerry K. Stonewater, Ohio Problem Solving Consortium Project Director, Department of Mathematics and Statistics, Miami University, Oxford, OH 45056. Materials have been made available through funding by a grant by the Ohio Board of Regents. Since you are free to copy any of these materials, only one copy of each booklet will be sent per request. Please indicate on your request which booklets you would like.