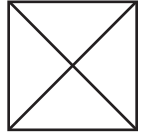


**Project****Divide and Conquer****Activity 1: Divide It Up** *Use after Lesson 6-1*

Many puzzles are based on one large shape that is divided into several smaller shapes. This activity will help you think about different ways a shape can be divided.

1. The figure shows a square that is divided into four congruent shapes. Use a sheet of graph paper to help you experiment with other ways of dividing a square into four congruent shapes. Keep track of your work to see how many different solutions you can find!
2. Now you are ready for a more challenging problem. Use isometric dot paper to draw a regular hexagon. How many different ways can you find to divide the hexagon into six congruent shapes?



You can score your results for the hexagon challenge as follows.

Puzzle Solver: 3 different solutions

Super Puzzle Solver: 4 different solutions

Master Puzzle Solver: 5 or more different solutions

**Activity 2: Squares in Squares** *Use after Lesson 6-5*

This puzzle is based on dividing a large square into many smaller squares.

1. On a sheet of graph paper, draw a square that is 14 units by 14 units.
2. Now divide the square into smaller squares. Be sure to follow these rules.
  - You must completely divide the square into smaller squares. No other shapes are allowed!
  - You must have at least three different sizes of squares.

The goal is to use as few squares as possible. Score your results as follows.

Puzzle Solver: 11-15 total squares in your solution (not counting the initial one)

Super Puzzle Solver: 10 total squares in your solution

Master Puzzle Solver: 9 total squares in your solution

**CHAPTER** **Project****6** ***Divide and Conquer*** continued**Activity 3: The Five Shapes Puzzle** *Use after Lesson 6-6*

Now you are ready to solve a more complex puzzle and then use your solution to make a jigsaw puzzle.

1. Draw a large square on a sheet of graph paper. Then find a way to divide the square into these ten shapes:
  - two congruent squares
  - two congruent rectangles (not squares)
  - two congruent parallelograms (not rectangles)
  - two congruent triangles
  - two congruent trapezoids

Be sure you divide the large square into these ten shapes with no gaps or overlaps. It may take several tries and a few adjustments to come up with a solution.

2. Once you have found a solution, see if you can find other ways to divide the large square into the required shapes.
3. Choose one of your solutions and use it to create pieces for a jigsaw puzzle. To do so, first glue a piece of patterned wrapping paper or a large magazine photo onto a piece of cardboard. When the glue is dry, tape your solution on top of the cardboard, and then use a pin to punch through each vertex of the solution. Now remove the paper with the solution. Using a straightedge, draw lines connecting the pin-hole vertices. This will reproduce the ten puzzle pieces on the cardboard.
4. Cut out the puzzle pieces. Mix them around. Then try to reassemble them into a large square.
5. Try to solve the puzzles your classmates made. You can also share your puzzle with friends and family members.