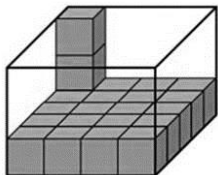| First Name: _____ | Last Name: _____ | Grade: _____ |
| Teacher: _____ | Parent's email: _____ | |

Squares and Cubes

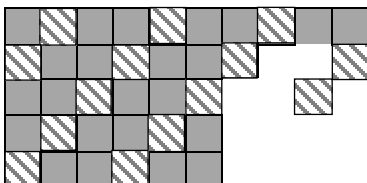Welcome to Math Challenge #15. This is the last challenge of this school year. Let's have fun with squares and cubes!

Kinder & First Grade: solve <u>at least</u> 3 problems.
Second & Third Grade: solve <u>at least</u> 7 problems.
Fourth Grade and above: solve <u>at least</u> 12 problems.

Answer

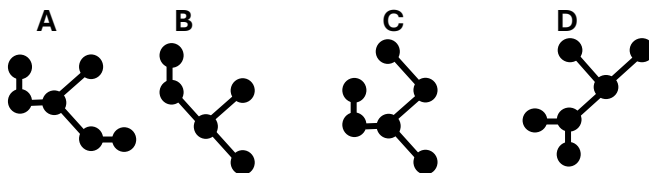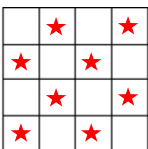|		
1.	Tiara uses cubes to make an X. How many cubes does she use to make two Xs?	
2.	Tim is builiding a structure with cubes. He has 5 cubes already. How many more cubes does he need to build the structure shown in figure 1? Figure 1	
3.	a. What is the 11th shape in this pattern? a. What is the 15th shape in this pattern?	*a.* *b.*
4.	Three identical cubes cost 10 cents more than one cube. How many cents does one cube cost?	
5.	Laura is walking from M to S along the lines, picking up the letters in MATHEMATICS in order. The letters are scattered in the square grids. Each square is 1 yard by 1 yard. How long, in yards, is the **shortest walk** that Laura can take?	

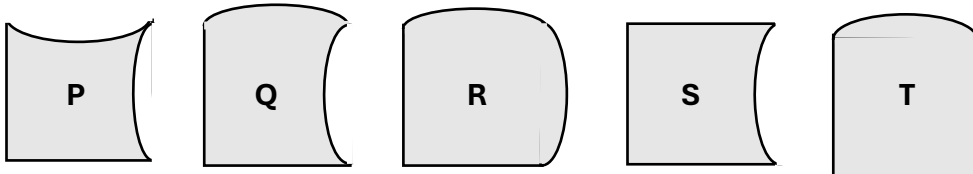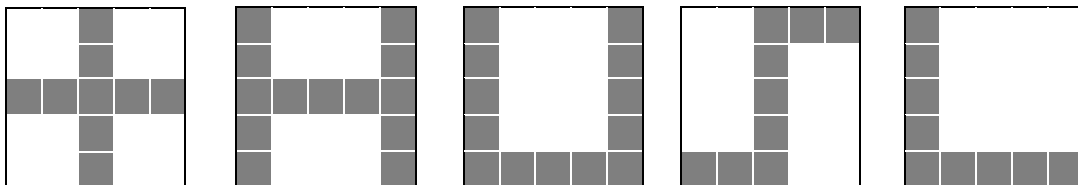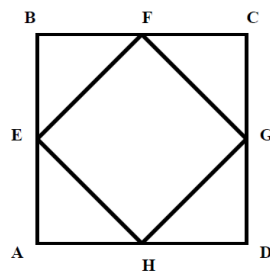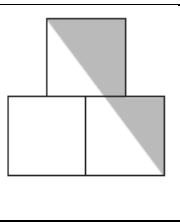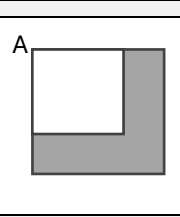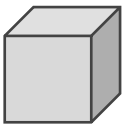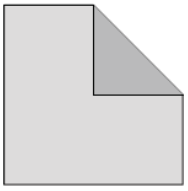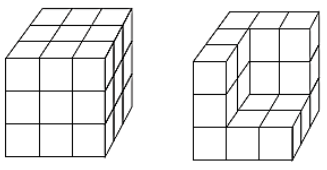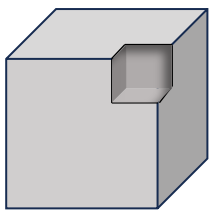|		
6.	How many more cubes will be needed to fill the rectangular prism below?	
7.	Two kinds of square tiles are used for a wall design with repeating patterns. The wall, when completed, will be 10 tiles by 5 tiles. How many more solid gray tiles are needed to complete the design?	
8.	Tina has the following squares marked with stars. How many of the following pieces cover at least 5 stars?	
9.	A square can be formed using four of these five pieces. Which piece will not be used?	
10.	Five squares are shaded as follows. How many of these shapes have the same perimeter as the sheet of paper itself?	
11.	Figure ABCD is a square with sides that each have a length of four units. E, F, G, and H are the midpoints of the sides. What is the area of square EFGH?	

12.	Three identical squares are arranged so that the center of the top square is directly above the common edge of the lower two squares. Each square has sides of length 5 inches. What is the area of the shaded region?	
13.	In the figure shown, two squares share corner A. The larger square has an area of 49 sq cm. The smaller square has an area of 25 sq cm. What is the perimeter of the shaded region, in cm?	
14.	The faces of a cube are numbered 1, 2, 3, 4, 5, and 6. Which number appears on the face opposite to the one numbered as 4 on a cube, given that faces 1 and 6 share an edge, and faces 1 and 5, 1 and 2, 6 and 2, 6 and 4, and 6 and 5 also share edges?	
15.	One corner of a square is folded to its center to form an irregular pentagon as shown in the diagram. The area of the square is 1 square unit greater than the area of the pentagon. What is the area of the square?	
16.	It takes 7.5 liters of paint to cover the surface of the cube on the left. How much paint would it take to cover the surface of the shape on the right? *The **surface area** of a solid object is a measure of the total area that the surface of the object occupies.*	
17.	A large square paper was cut into half, from which each of the resulting rectangles was then cut into half to make four smaller squares. This process was repeated for each of those smaller squares until the original square paper was successfully cut into 256 identical tiny squares. If each of those tiny squares had a side length of 1.5 inches, what was the perimeter of the original large square paper?	
18.	Tony cut out a corner of a wooden cube with an edge of 3 cm. The cut was in the shape of cube with an edge of 1 cm. He repeated that process for each of the corners of the big cube. a. What is the number of faces of the solid after cutting out such a small cube at each corner of the big cube? b. What is the surface area of the wooden cube after the cuts?	*a.* *b.*