
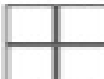


$$5y \leq 3y + 10 + 6(x + 3) = 6x + 18 + 3x + 2y + 24 + x$$

Crunchy Functions

Watch students sink their teeth into functions and problem solving (not to mention snack crackers) with this tasty hands-on activity!

Directions

1. Review the terms *function* and *perimeter* with students. Explain to groups that they will use crackers to find functions in shape patterns.
2. **FUNCTION 1:** On the board, draw one square. Note that if you call each side 1 unit, the square has a perimeter of 4 units.
3. Draw another square next to and touching the first one. Ask students: *What is the perimeter now?* [6 units] 
4. Next, have each group place crackers in a row to discover the perimeter for a row of 3, 4, 5, 6, or 7 crackers. Have them determine what function can be used to figure the perimeter for a row of 15 squares. [If s = the number of squares, the function is $2s + 2$. So a row of 15 squares has a perimeter of 32.]
5. **FUNCTION 2:** Tell students that in this activity, they will be building large squares from the small cracker squares. Draw squares on the board as shown. Point out that to make a square with a length of 1 unit, you need 1 cracker. To make a square with a length of 2 units, you need 4 crackers. 
6. Have students use crackers to make squares with lengths of 3, 4, and 5 units. Let them determine how many crackers it will take. Ask: *What function could be used to find the number of crackers you would need to make a square with a length of 12 units?* [If l = the length of the square, the function is $l \times l$, or l^2 . So for a 12-unit-long square, you need 144 crackers.]
7. **FUNCTION 3:** Have students build squares to find the function for the perimeter. Ask: *What is the perimeter of a square with a length of 12 units?* [When l = length, the perimeter is $4l$. For the 12-unit square, the perimeter is 48 units.]

Taking It Farther

Let students use sugar cubes to find functions for the surface area of a stack of cubes, and for large cubes made out of smaller cubes.

Assessing Skills

Observe whether students test their functions to see if they work.

LEARNING OBJECTIVE

Students use manipulatives to find and test functions.

GROUPING

Cooperative groups

MATERIALS

- one or two boxes of square-shaped crackers, at least 25 per group. (Square counters may be used instead of crackers.)
- pencil and paper for each group
- sugar cubes (optional)