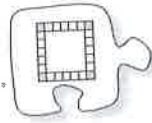
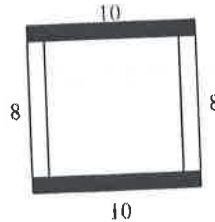


4.1.3 How can I describe any figure?

Using Variables to Generalize



4-21. The diagram below represents one method you can use to find the number of tiles in the frame of a 10-by-10 square. Use the diagram to answer parts (a) and (b) below.

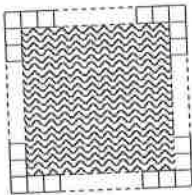


a) Look at your resource page (on NB 91).

Whose method was this?

b) Use this method to determine the number of tiles in the frame of a square that is 18 tiles by 18 tiles.

4-22. GENERALIZING: Can you describe how to use the method described in problem 4-21 to find the number of tiles in a square frame with any side length?



Your Task: Work with your team to write a general set of directions in words that describes how to calculate the number of tiles in the frame of any square, if you are given the side length.

4-23. What if you wanted to send the directions from problem 4-22 in a text message? When people send text messages, they often find ways to shorten words. For example, they might use a letter that sounds like a word, such as "u" instead of "you." They might also use an abbreviation like "btw" instead of "by the way."

In Lesson 4.1.1, you used a variable (h) to represent an unknown number for the distance Croakie traveled in one hip-hop jump. Now you are going to use a variable in a different way: to represent a number that can vary within a given situation.

Your task: You have written a set of directions for calculating the number of tiles in any square frame. How can you use numbers and symbols (an expression) to shorten your directions? With your team find a way to shorten your set of directions by using a variable (such as x) to stand for "the number of tiles in one side of the frame."

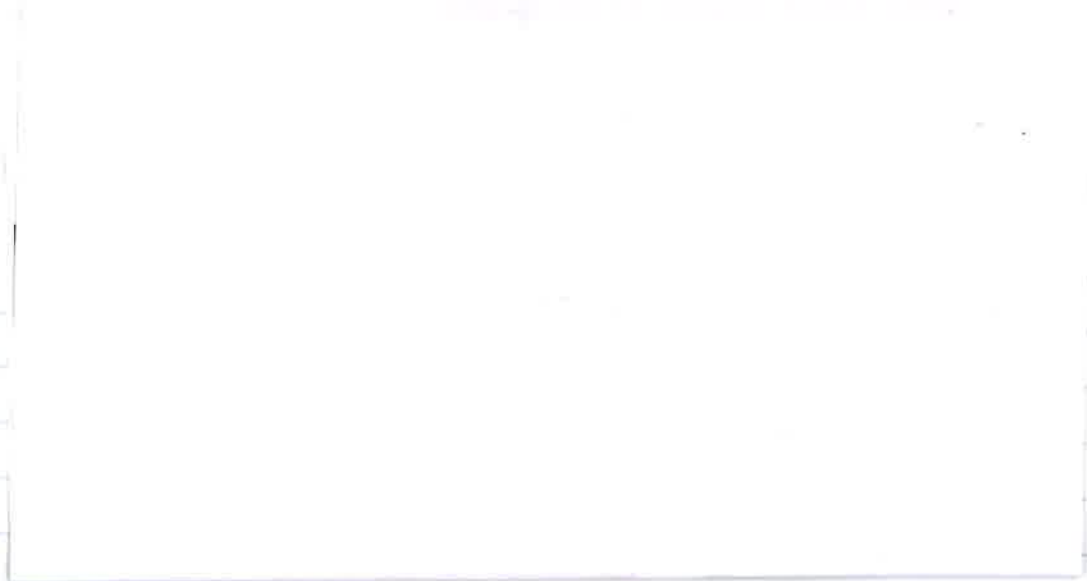


4-2

4-2

4-2

led



4-21^{a)} This is Tina's method.

b) $18 + 18 + 16 + 16 = \underline{68}$ tiles

4-22 To find the number of tiles needed using Tina's method you add the side length twice and the side length minus two twice.

4-23 $x =$ the length of one side

$x + x + (x - 2) + (x - 2)$

Algebraic Expression