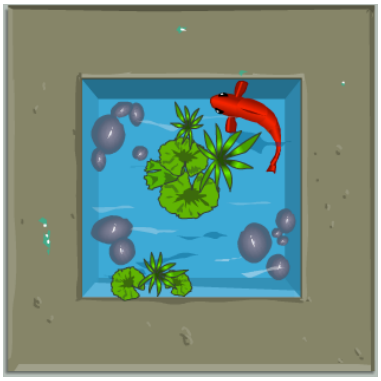
Student: _____ Class: _____ Date: _____

Multiple representations in the real world

Student Activity Sheet 1; use with *Overview*

1. Anthony's father is going to put a tile border around this square fish pond. The pond is 1 yard on each side. The tiles are squares that are 1 foot on each side. How many tiles will Mr. Chen need? Explain how you solved this problem.



2. When you use real objects (or pictures of real objects) to model a problem, you are making a _____ of the problem.

Without space for student work

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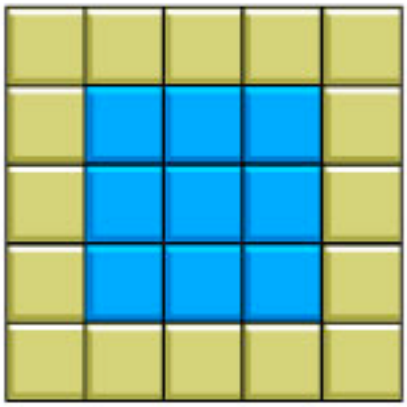
Student Activity Sheet 2; use with *Exploring* "Tiling square pools"

1. Here is Anthony's model for the 1-yard-square pool and border.



What should Anthony's models for the two smallest pools in this sequence look like? Make a sketch.

2. What is the relationship between the length of the side of each pool and the number of tiles in the border? Make a numerical representation of the relationship.

Pool Side Length and Borders

Length of pool side in feet	Tiles in border

3. What pattern does the numerical representation reveal, and how does it connect to the model?

4. Write a symbolic representation (a function rule) of the relationship between the length of the side of the pool and the number of tiles in the border.

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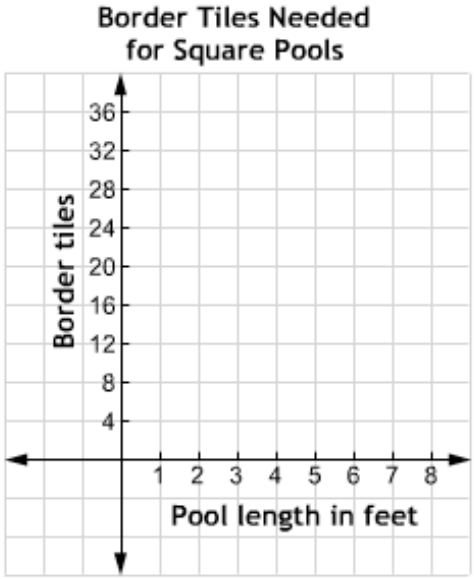
Student Activity Sheet 2; use with *Exploring* "Tiling square pools"

5. Make a graph of your numerical representation of the relationship between the length of the side of the pool and the number of tiles in the border. Then add the graph of your symbolic representation to the same graph.

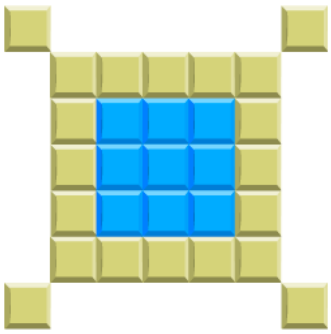


6. Notice that the graph of the mathematical function $y = 4x + 4$ is continuous.

   a. What are the domain and range of the mathematical function?

   b. Anthony's pool-tiling problem is a discrete situation. What are the domain and range of the function that models this situation?

7. Create each of the following representations of the relationship between the length of the side of a square pond and the number of tiles in the border for this new design.



   a. Numerical representation

   b. Verbal representation

   c. Graphical representation

   d. Symbolic representation

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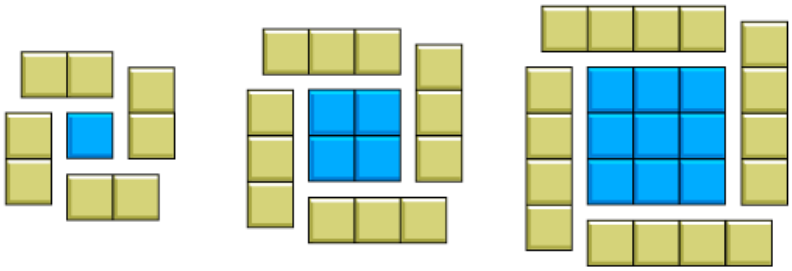
Multiple representations in the real world

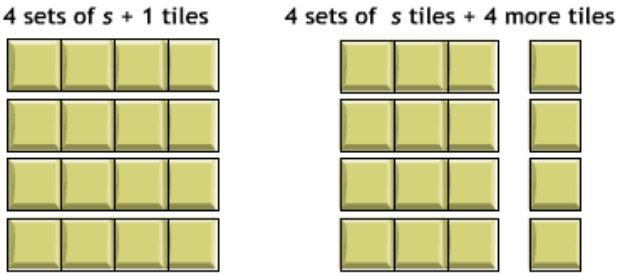
Student Activity Sheet 3; use with *Exploring* "What's in a rule"

1. Anthony explains his representations to his dad and his uncle Tajil. Mr. Chen is impressed, but Uncle Tajil, unconvinced, makes a model of his own. "Look here, Anthony," he says. "I think of the pools like this."



Let ***s*** represent the length of one side of the pool, and ***t*** represent the number of tiles in the pool's border. Can you write a rule that represents Uncle Tajil's model?

2.

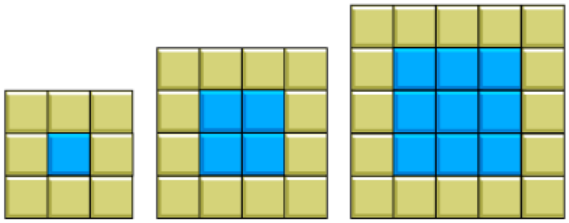


This model shows that ____(_____) = _____.

This is an example of the _____ property

of _____ over _____.

3. Explain why the number of tiles in the border of a pool is the same as the area of the border.



4. Explain using words and pictures why $(s+2)^2 - s^2 = s^2 + 4s + 4 - s^2 = 4s + 4$.

Without space for student work

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Student Activity Sheet 3; use with *Exploring* "What's in a rule"

5. Evaluate each of the expressions at your assigned number and record the results in the table. What do you notice?

$t = 4s + 4$	$t = 4(s + 1)$	$t = (s + 2)^2 - s^2$

Without space for student work