Fluffy Puppy Hotel

A Multiplication Mini Unit

Standards

3.OA.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7*.

3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.5 Apply properties of operations as strategies to multiply and divide.2 *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)*

3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends*.

The Scenario

Fluffy Puppy Inc. is the leading provider in everything puppy. This company has just purchased a plot of land, and is planning on building a top-of-the-line puppy hotel. Forget what you already know about dog boarding. This new hotel will feature individual doghouses and yards for each dog, and a large area for a dog park. The plot of land is 28 by 36 feet. Each doghouse is the same size in square feet, but no two houses will have the same dimensions, making them each unique in their own way. Your job is to divide the land into plots that are each 36 square feet. Each plot also needs to include a doghouse, which is 24 square feet. In addition, there needs to be enough room for a large dog park.

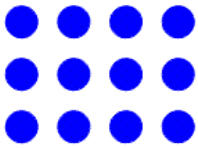
A few things to keep in mind…

- The more doghouses and yards that you are able to fit, the more dogs will be able to stay, and the more money the company will make.
- The yards may or may not have the same dimensions
- No two dog houses can have the same dimensions, however, you can use the commutative property to switch the length and width. (For example: 12 ft x 2 ft = 24 sq ft can be changed to 2 ft x 12 ft = 24 sq feet)
- Using graph paper to find area is just like creating an array to represent a multiplication problem. Each square will equal one square foot.
- You will use graph paper to create as many rough drafts as needed, and then create a final product.

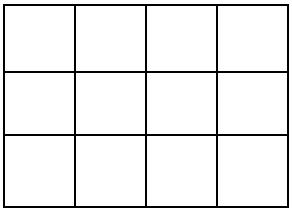
Task One

Arrays vs. Area Model

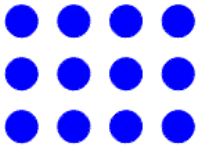
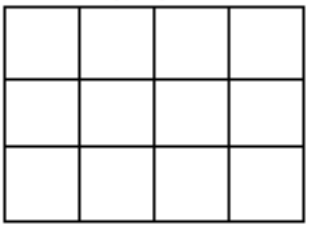
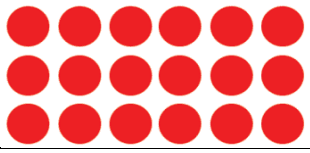
Making an array is just like finding area. To represent the problem 3 x 4 you could draw the following array…

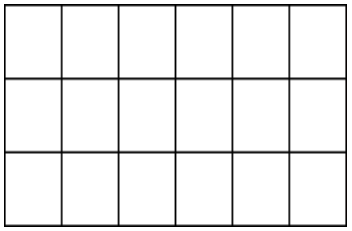


To use an area model to represent the same problem, you would draw this…



Fill in the chart using an array and the area model for each multiplication problem. Don't forget to fill in the product.

Multiplication problem	Array	Area Model
4 x 3 =____		
2 x 4 = _____		
		

5 x 4 = _____		
		

Challenge: Now that you understand the area model, see how many models you can create with a product of 12. That means that every model will have 12 squares in total. Show your work below or on another paper.

Task Two Rough Draft

Use the attached pieces of paper to create as many rough drafts as you need for your Fluffy Puppy Hotel. The total area has already been marked off for you.

Task Three Final Draft

Use an attached piece of paper to create your final copy. Take your time and make it as neat as possible. Feel free to include color and extra details!

Task Four

Word Problems

1. Fluffy Puppy charges $12 a night for a dog to stay in one of the doghouses. How much money will the company make a night if you fill each doghouse?

2. Fluffy Puppy spends $3 a day on dog food for its furry guests. How much money will the company spend on food each night if you fill each doghouse?

3. Write your own word problem about Fluffy Puppy Hotel. Find a friend to solve it.

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