



Activity 2: Counting Smart

Part 1

Take a handful of paper clips, pennies, or tiles. Arrange them as arrays so you can see how many there are without counting each one.

1. Sketch your arrangement using columns and rows.
2. Write an equation that shows how you can find the total amount without counting each item.
3. Sketch another arrangement. If you did not try arranging by 10's, try that now.
4. Write an expression that shows how you found the total amount without counting each item.

Part 2

Draw a picture that communicates each mathematical expression.

1. $4 \times 9 + 2$

2. $20 - 3 \times 5$

3. $3 \times 4 \times 5$

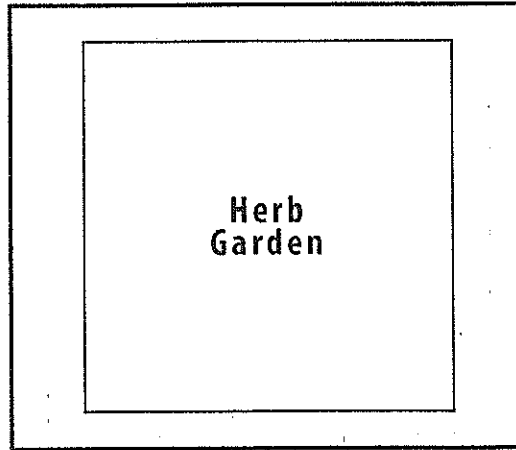
4. $3(4 + 6)$

5. Now pick one of the mathematical expressions above and write a word problem for it.



Activity 3: Garden Pathway

Valerie and Rebecca own a landscaping business. A customer wants them to install a garden and a square-tile pathway surrounding it. This is the picture the customer provided.



Each woman saw the math differently. Of course, they didn't count each tile! Show two different ways that Valerie and Rebecca could have figured out the number of tiles.

1. First way:

2. Second way:



Practice: Cartons of Eggs

Write your answers on a separate sheet of paper.

1. Without counting each egg, how many do you see?
2. How did you think of your answer?
3. List with words and numbers each step you took mentally or on paper to find the total.
4. Write another expression to show how you could count the eggs.



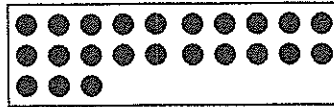
Practice: Expressions, Arrays, and Stories

Part 1

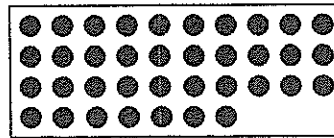
Below you will see three partially or totally filled arrays. Each is preceded by several expressions. Circle the expressions that do *not* match what you see.

Reminder: Parentheses indicate multiplication or tell you to do the operation inside them first.

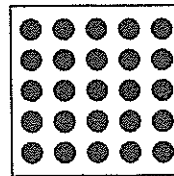
1. $10 + 10 + 3$ $3 \times 3 + 10$ $10 \times 2 + 3$ $3 + 2(10)$



2. $3 \times 10 + 7$ $10 + 10 + 10 + 7$ $3(10 + 3)$ $4 \times 7 - 3$



3. $5 + 5 + 5 + 5 + 5$ $5(5)$ $5 \times 5 + 5 + 5 + 5$ 5^2

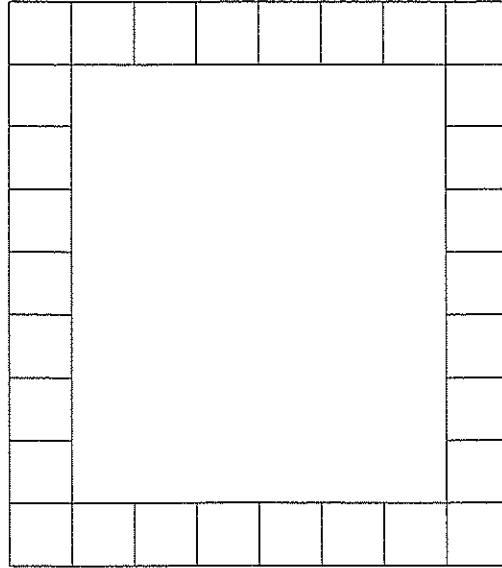


Part 2

Choose one of the arrays above to match each story.

- Zippy and four friends pool their money. Each person contributes five dollars. Array _____
- Zippy and two friends decide to go in together on a gift for their teacher. Zippy's two friends have 10 dollars each to give. Zippy has only three dollars. Array _____
- Three friends and Zippy decide to share the cost of a take-out order from the local restaurant. Everybody gives 10 dollars but Zippy. He is three dollars short. Array _____

2. Show how you find the total number of tiles. Is there more than one way?

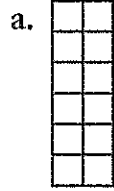




Practice: Stone Paths

The following are rectangular arrays for paths made using 12 flat stones.

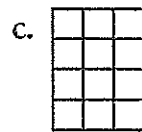
1. For each one, write a multiplication expression that describes the array.



Equation: _____



Equation: _____



Equation: _____

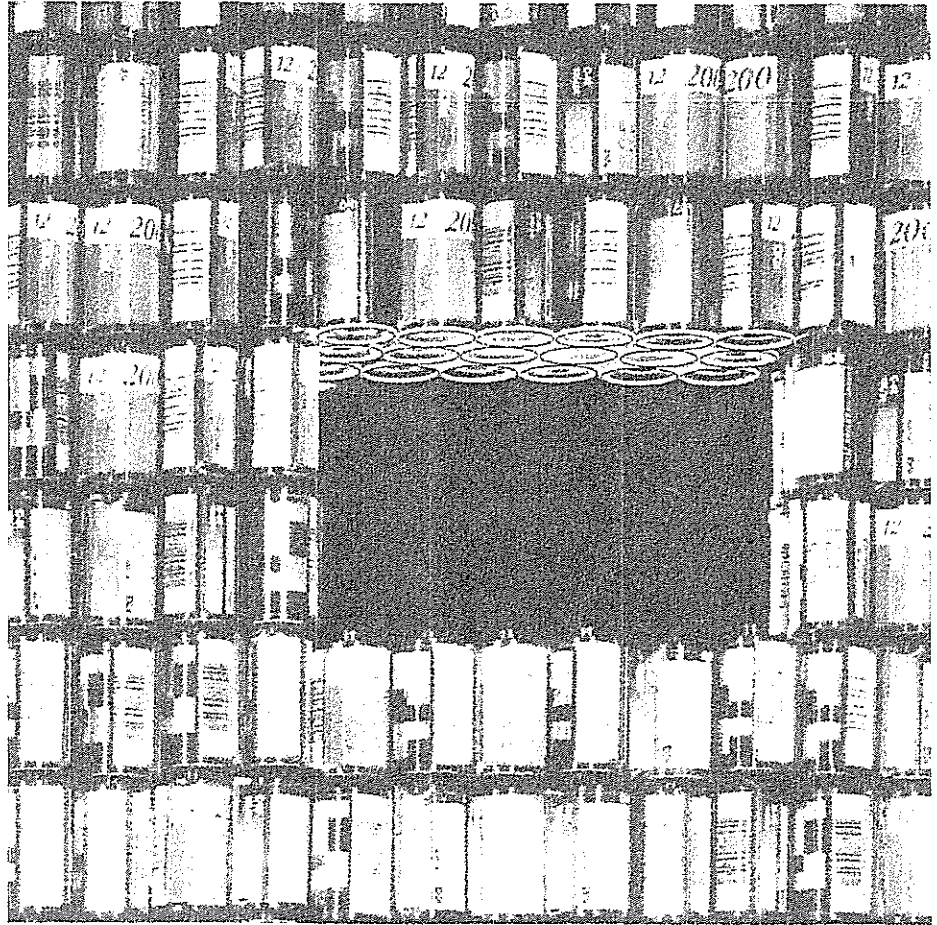
2. a. Find all the possible stone path arrays for 23, 24, and 25 stones.
Use the grid paper on the next two pages to draw the arrays.

- b. Write equations that describe each of the arrays you find.

- c. Why are there more paths for 24 stones?



Extension: Missing Rolls of Film



How many rolls of film are missing in the black area? How do you know?