

Core Content

Cluster Title: Work with equal groups of objects to gain foundations for multiplication.
Standard 4: Use addition to find the total number of objects arranged in rectangular arrays with up to five rows and up to five columns; write an equation to express the total as a sum of equal addends.
MASTERY Patterns of Reasoning:
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will understand what a rectangular array is. Students will understand how to arrange any set of objects into a rectangular array. Students will understand how the rectangular array represents repeated addition. Students will understand how to write an addition equation representing the array as a sum of equal addends. <p>Procedural:</p> <ul style="list-style-type: none"> Students can determine the total number of objects in each row or column for arrays with up to five rows and up to five columns. Students can use addition to find the total number of objects in a rectangular array. Students can write an addition equation to express the total of objects or representations in a rectangular array as a sum of equal addends (adding either columns or rows). <p>Representational:</p> <ul style="list-style-type: none"> Students can build a rectangular array with objects. Students can build a rectangular array on a geoboard. Students can draw a rectangular array using grid paper or a pictorial representation.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will understand the attributes of a rectangle. Students will understand that a rectangle can be divided into rows and columns.

Students will understand how to write an addition equation.
 Students will understand the definition of sum and addend.

Procedural:

Students can identify an array as being arranged in rows and columns.
 Students can identify the number of rows in a rectangular array.
 Students can identify the number of columns in a rectangular array.
 Students can identify the number of squares within a row/column.
 Students can write an addition equation and find the sum of the addends.

Representational:

Students can create a rectangle using objects.
 Students can create a rectangle on a geoboard.
 Students can draw a rectangle.

Academic Vocabulary and Notation

rectangular array, repeated addition, row, column, equation, sum, and addend

Instructional Strategies Used

Use square color tiles to create an array. Split the array into rows to represent a repeated addition equation.

Roll two number cubes. One cube will represent the number of columns in an array; The other cube will represent the number of rows in an array. Create an array with color tiles. Write an addition problem with equal addends to express the total sum of color tiles in the array.

Put students into cooperative groups. Give each group 12 small objects. Challenge the groups to make as many different rectangular arrays as possible. Have them draw a picture to show all the arrays they were able to create. With each picture, have them write a repeated addition equation to express the total sum of the objects.

Resources Used

Hutchins, Pat. *The Doorbell Rang*. Live Oaks Media, 2004.

Princzes, Elinor J. *One Hundred Hungry Ants*. Sandpiper, 1999.

plastic square color tiles

Arrays at BrainPOP Jr.:
<http://www.brainpopjr.com/math/multiplicationanddivision/arrays/grownups.weml>

Fit! Game:
http://www2.edc.org/thinkmath/lib/samples/G3C2L2TG_Sample.pdf (see p. 24)

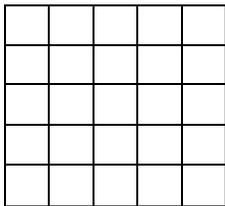
Give the students dot paper and counters. Have the students arrange the counters in many different arrays. Next, have the students mark the dots in each array on the dot paper. Next to each array, write a repeated addition equation to show the sum of the dots.

Read the book *The Doorbell Rang* by Pat Hutchins. Give the students 12 paper cookies. As the teacher reads the book, have the students arrange their cookies into arrays to match the story. Write a repeated addition problem for each array. This activity can also be done with *One Hundred Hungry Ants* by Elinor J. Princzes.

Assessment Tasks Used

Skill-Based Task:

Write a repeated addition problem for the following array.



Problem Task:

Sally got a box of chocolates for Valentine's Day. She wants to eat one row of chocolates each day. How many chocolates will she eat in four days? Write an addition problem to find the number of chocolates she will eat.

