

Teacher Instructions

Title: Building Arrays Using Excel Spreadsheets

Grade Focus: 3, 4, 5

Subject: Math

Technology Integration: PowerPoint Presentation, Digital Imaging

Recommended Time to Completion: Two 45 minute class periods

Introduction

Students will use a Microsoft Excel spreadsheet to model arrays to solve one-digit multiplication problems. During the lesson, students will be working in pairs to solve multiplication problems.

Prerequisite Experience

Prior to this lesson, students and teachers should be familiar with functions of Microsoft Excel (formatting background, changing font color, etc.) It is important to make the connection, that multiplication problems can be labeled or called different names. All of the following describe the same action.

- $2 \times 2 = 4$
- 2 times 2 = 4
- A 2 by 2 array is 4.

You may want to review these words prior to the lesson:

Important Vocabulary Words

Array

Rectangle

Dimension

Multiply

TEACHER PREP TIME: 1 hour

Prior to the lesson, you may want to review these videos.

- Mathematics for Primary Series: Multiplication. AIMS Multimedia. 1977. unitedstreaming. 4 January 2008
<<http://streaming.discoveryeducation.com/>>

- Array Back When: Understanding Multiplication. AIMS Multimedia. 1991.
unitedstreaming. 4 January 2008
<http://streaming.discoveryeducation.com/>

If you do not have access to United Streaming, you can sign up for a free 30 Day Trial at www.unitedstreaming.com.

Alternately, you may wish to show the following video on TeacherTube, a free teaching video web site.

Using Arrays to Solve Multiplication Facts
http://www.teachertube.com/view_video.php?viewkey=3730f82b150c5ef38b8f

MATERIALS:

Laptops/Classroom Computers
Copies of Building Arrays Multiplication Worksheet
Graph Paper

Project

Students will use a Microsoft Excel spreadsheet to model arrays in order to solve one-digit multiplication problems.

Assessment/Grading

Teachers will evaluate by checking for accuracy on their written work, observing students and having students explain their thinking out loud.

Time Management Tips

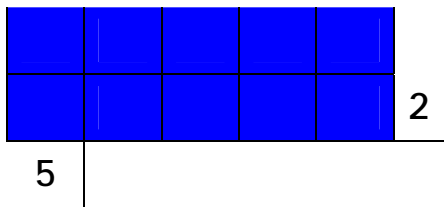
Students can be divided into pairs and share one computer. Also, create table groups to discuss problems.

Engage

Engage

Students:

Based upon the video clips that you saw, describe an array.



How does drawing help describe an array?

Your teacher will show you how to use the Microsoft Excel Spreadsheet entitled "Graph Paper" to build an array. We need to build a rectangle (or array) that has sides that are 2 units long and 3 units long. We call this a 2 by 3 array. Have you ever heard someone talk about a piece of wood called a 2 by 4? It means that the wood is 2 inches by 4 inches on the end.

Teachers: Using a computer and projector, open the Microsoft Excel Spreadsheet entitled "Graph Paper" (see attachment). Explain the example problem that is shown: 2×3 . Show the students that the dimensions of your array are 2 units by 3 units. When the students agree that this array is correct, ask the students the answer to 2×3 . Have a volunteer come up to count the number of squares that are shaded in. There are 6, therefore $2 \times 3 = 6$.

You can shade in the squares by highlighting the squares, then clicking on the paint bucket on the toolbar. You can choose a color for each array. If you want to change the color of the font, you can highlight the text you want to change and find the letter with the stripe of color underneath it on the toolbar and choose a color.

Explore

Explore

Building Arrays - Multiplication

Use Microsoft Excel to make the following arrays. Then solve the multiplication problems.

$1 \times 4 = \underline{\quad}$

$8 \times 2 = \underline{\quad}$

$3 \times 5 = \underline{\quad}$

$3 \times 8 = \underline{\quad}$

$4 \times 9 = \underline{\quad}$

$4 \times 2 = \underline{\quad}$

$5 \times 1 = \underline{\quad}$

$2 \times 5 = \underline{\quad}$

$6 \times 2 = \underline{\quad}$

$3 \times 6 = \underline{\quad}$

$4 \times 7 = \underline{\quad}$

$6 \times 5 = \underline{\quad}$

:

Using the worksheet provided, explore more arrays. Choose a partner to help you build your arrays. When you have built your array in Excel, solve the multiplication problem.

Then check with the others in your table group. Discuss each of the problems with your partner and table group.

As a team, write a description of an array.

Explain

Explain

Share your graphs with the rest of the class. Does everyone's graph look the same?

Work with a partner to create your own arrays using any numbers you choose. Share your thinking out loud and check over your work for accuracy.

Independently, write your own story problem for this array. Compare your story problem to the one your partner created. What are the similarities between your story and theirs?

Teacher: This web site will help solidify the students' understanding of arrays and the concept of multiplication.

http://www.eduplace.com/math/mw/background/3/05/te_3_05_array_develop.html

Elaborate

Elaborate

Create your own digital mini-book to explain multiplication using arrays. Share your books with 2nd graders to help them learn more about multiplication.

Review the attachment, Orange Orchard Digital Book, for an example.

Use the resources below to help in the creation of your book.

- <http://www.nortellearnit.org/technology/Imaging/>
- http://www.nortellearnit.org/technology/PowerPoint_Presentations/

Evaluate

Evaluate

Your teacher will be evaluating your work using the following questions.

- Do the dimensions of the array match the problem given?
- Are the dimensions labeled clearly?
- Is the answer correct?
- Is the answer clearly labeled on each array?
- Was the student able to create his own problem and solve it successfully?
- Does the story problem match the array?

(Many students will make the array correctly, and then write a story problem that does not connect to it. They might write an addition problem that has the same answer, for example.)

Extend

Extend

Consider extending this activity using any of these suggestions:

1. With a partner, create, label and print a new array. Then, on a separate paper, write your own story problem that goes with that array.

Your teacher will shuffle the arrays and place them on the carpet, face up. You and your teammate will be given a random story problem. Try to match your story problem to the correct array. What strategies did you use to do this?

2. Try to build arrays on the playground using a tape measure, where one foot equals one unit.

3. How is a basketball or tennis court an array? Figure out the area of this space.

4. Work as a class to create a quilt using different sizes of arrays.

5. Using 1-cm graph paper, create a repeating pattern/design using arrays. On a separate sheet of paper, write the multiplication facts that accompany the arrays.

Related Resources

Interactive Multiplication Games:

This web site offers educational games that sharpen multiplication skills. (One player)

http://www.multiplication.com/interactive_games.htm

Each Orange Had 8 Slices

By Paul Giganti

This book explores story problems that use multiplication. Have students make a model of the problems mentioned in this story.

