Arrays

Unit 5 Investigation 3

3.1 Arranging Chairs

Objectives:
- Using arrays to model multiplication situations
- Using arrays to find factors of 2-digit numbers up to 50

Ways To Arrange 12 Chairs

Different Ways to Make 12
Arrays

**Arranging Chairs** (page 1 of 3)

You need:
- 3D cubes
- 4 sheets of half-inch grid paper
- Scissors
- Glue stick
- 2 sheets of unlined colored paper

Work with a partner:
1. Write the first number you are working on: _____
2. Figure out all the ways you can arrange that many chairs. Each row of each arrangement must have the same number of chairs. Show your arrangements as rectangles.
3. Draw each rectangle on the grid paper.
4. Cut out each rectangle and glue it onto the colored paper. Label each rectangle with its dimensions.
5. Make a list of the dimensions you found for your number. Your paper should look like the one on Mite.
6. Write the second number you are working on and follow steps 2-5: _____

**Discovery Education Video**
"Array Back When" (Understanding Multiplication)


**3.2 Investigating Arrays**

Objectives:
- Using arrays to identify characteristics of numbers, including prime and square numbers
- Using arrays to find factors of 2-digit numbers up to 50

**How to Make Array Cards**

You need:
- 8 sheets of Array Cards (M17-M20)
- Reusable plastic bag
- Pencil
- Scissors

Work on your own:
1. Start with the first sheet of Array Cards (M17). Label the grid side of each array with the dimensions of the array.
2. When you have finished labeling the dimensions of the array, cut it out. Cut carefully, following the outlines of each array as exactly as you can.
3. On the back of each card, write the number of squares in the array (the product) and one dimension of the array.
4. Write your initials on each card. Put your cards in the plastic bag.
5. Repeat these steps with each sheet of Array Cards. Be sure to keep your cards together.

**3.3 Finding the Number of Squares in an Array**

Objectives:
- Using arrays to find a product by skip counting by one of its dimensions
- Breaking an array into parts to find the product represented by the array
- Identifying and locating multiplication combinations not yet known
Arrays

2A) Arranging Chairs

2B) Making Array Cards

3.4 Array Games

Part 1

Objectives:

• Using arrays to find a product by skip counting by one of its dimensions
• Identifying and learning multiplication combinations not yet known
• Using known multiplication combinations to determine the product of more difficult combinations

Factor Pairs

You need:

• Set of Array Cards
• “Combinations I Know” and “Combinations I’m Working On”

Play alone or with a partner.

1. Spread out all of the Array Cards in front of you with the dimensions side up.

2. Choose an Array Card and put your finger on it. Say the number of squares in the array if you know it. [Do not pick up the card until you say the answer.]

3. If you do not know the strategy to figure it out, find a way to figure out how many squares there are without counting every one.

4. Turn the card over to check your answers if your answer is correct, keep the card.

5. If you are playing with a partner, take turns choosing cards and finding the number of squares in each array. Play until you have picked up all the cards.

6. While you are playing, make lists for yourself of “Combinations I Know” and “Combinations I’m Working On.” You will be using these lists to help you learn your multiplication combinations.
Arrays

3.5 Learning Multiplication Combinations

**Objectives:**
- Identifying and learning multiplication combinations not yet known
- Using known multiplication combinations to determine the product of more difficult combinations

### Practice with Multiplication Cards

**You need:**
- 1 sheet of Multiplication Cards
- Array Cards
- Scissors
- paperclip
- reusable plastic bag

**Play with a partner.**

1. Cut out each Multiplication Card and write your initials and the product on the back. Check each product with a calculator, your Array Cards, or someone else’s help.
2. Ask someone to show you the front of each Multiplication Card. Say the product as quickly as you can. If you get it right away, put the card in a pile of combinations that you “just know.”
3. If you have to stop and figure it out, put it into a different pile of combinations that you are “working on.”
4. Paperclip your “just known” cards together and put them in the plastic bag.

### Practice with Multiplication Cards

**You need:**
- 1 sheet of Multiplication Cards
- Array Cards
- Scissors
- paperclip
- reusable plastic bag

**Play with a partner.**

1. Look at each card in your “working on” pile. Think of an easy multiplication combination that you already know that can help you remember this one. Write it on the line that says “Start with ______.”
2. For all your cards back together, including the ones you “just know” and go through them again. Keep practicing over the next few weeks until you have no more cards in your “working on” pile.

2A) Factor Pairs
2B) Arranging Chairs

3.6 Array Games Part 2

**Objectives:**
- Breaking an array into parts to find the product represented by the array
- Identifying and learning multiplication combinations not yet known
- Using known multiplication combinations to determine the product of more difficult combinations
Unit 5 Investigation 3

Arrays

Count and Compare
You need:
• set of Array Cards

Play with a partner or in a small group:
1. Place the Array Cards so that all players have the same number of cards. Set aside any cards that are left over.
2. Players place their cards in a stack in front of them with the dimensions side up.
3. Each player places their top card from his or her stack dimension side up in the middle of the table.
4. Players decide whose card has the largest array by skip counting. Using a known multiplication combination, placing the arrays on top of each other, or some other strategy. Counting the squares by 1s is not allowed.
5. Each player with the largest array takes all cards from the round and places them on the bottom of his or her stack. If all arrays in the round have the same product, players make a rule to determine who gets the cards. When a rule is decided, it cannot be changed until the game is over.
6. When all the cards are gone the player wins.

2A) Play Count and Compare
2B) Making Multiplication Cards
2C) Factor Pairs

Arrays Game
http://exchange.smarttech.com/details.html?id=aa84e863ee2f4c0b9e60842b9aaf975dce54e779e3bbb30477ae092e6cd636b6
Multiplication Combinations
http://exchange.smarttech.com/details.html?id=x10797c6d58b94f389ebad805b6c46b03
Using Arrays To Show Multiplication Concepts - Lesson
http://www.mathcats.com/explore/multiplicationtable.html

Explore the Multiplication Table

3x5
5x3
3x11
12x3
2x2
2x8