Cover Up

Grade 3

Activity 317

Relevant Chapters in the *Digi-Block Comprehensive Teacher's Guide:*
　　Book III, 3-3: Combining Equal Groups of Larger Blocks, pages 84 - 86

Overview

Students use basic fact knowledge to multiply tens and hundreds by a single digit number.

Objectives

Thinking Skills:　　Students model "growing" products as they use blocks to compare facts such as 3 x 4, 3 x 40, and 3 x 400. They note the shift to the left in the products, from 12, to 120, and 1200. Students explore commutativity and verify that the order of the factors (10 x 4, 4 x 10) does not affect the product.

Mastery Skills:　　Students learn to multiply tens and hundreds by a single digit number.

Materials

Each pair of students needs:
- "Cover Up" game boards, one per student (Activity Sheet 1)
- "Cover Up" cards, one set per pair (Activity Sheet 2)
- Small cup in which to place the "Cover Up" cards
- Blocks available, for students to model problems when necessary

Class Introduction   **(20 minutes)**

Use blocks to model the concept of multiplying a single-digit number by 1, 10, and 100. For example, have students compare the block representations of 4 ones (4 x 1), then 4 blocks-of-10 (4 x 10) , then 4 blocks-of-100 (4 x 100).

- Compare the products, 4, 40, and 400 and review the place value of the 4 and the zeros in each product.
- Ask, **How are the products different? How are they the same?** Repeat with different problems to be sure all students understand the concept.
- Discuss the shifting of the digits to the left in each product. Students should note that when blocks are multiplied by ten, they become blocks that are one size larger. Or, in the case of multiplying by 100, they become two sizes larger.

Have students predict the answers to problems such as,

- 8 x 1, 8 x 10, 8 x 100*
- 5 x 100
- 6 x 1
- 9 x 100

*   Check each product with blocks. Discuss the shifting of the digits.

If students are ready ask, **What would happen if instead of making 4 ones, 4 tens, and 4 hundreds, we "switched" the factors and made one four (1 x 4), ten fours (10 x 4) and one hundred fours (100 x 4)?**

- Allow "think time" for this and then have students quietly discuss their ideas with their neighbors.
- Students who understand the commutative property of multiplication may explain that the order of the factors does not change the product. Ask students to prove this.
- In small groups, or as a whole class, make the 1 group of 4, the 10 groups of 4, and the 100 groups of 4.
  - Students will easily "see" the connection between the four ones and the one four.
  - Next, show the ten fours. Students may count by fours to 40 to prove that there are 40 blocks in all. If the blocks are

arranged in an array, students may also be able to find and count the 4 tens as a "shortcut."

- The 100 fours will be a challenge! Students may be able to visualize an arrangement where they extend the array above, where the rectangle is 100 blocks wide. Help them see the 100 fours and the four hundreds, as well.

Students will agree that it is much easier to think of 4 hundreds than one hundred fours! This idea will be revisited when students are introduced to 2-digit multiplication problems later on.

Depending on students' level of understanding, extend the idea to show multiplying a single-digit number times a multiple of 1, 10, and 100. For example, model 4 x 3, 4 x 30, and 4 x 300. Another, more difficult growing fact to try is: 6 x 7, 6 x 70, and 6 x 700.
- Have students discuss the shift of the digits in the products, as they are represented by the "growing" or larger blocks.

Activity   **(10 - 15 minutes)**

Explain to students that they will work in pairs to play a game called "Cover Up" to give them practice multiplying larger numbers. Have blocks available for student use as they are playing the game.
- Each player has a game board (Activity Sheet 1) and 20 fact cards (Activity Sheet 2).
- Cut out the cards, shuffle them, and place them in a cup.
- Players take turns drawing a card from the cup and placing the card on top of the matching product space on their game boards.
- Students may use blocks to verify products when needed.
- If a product is already covered, the player skips a turn.
- The winner is the first player to cover 4 spaces in a row.

Have students play a second round and/or change partners, if time permits.

Closure (10 minutes)

Have students pick a card from their game cup and describe how they knew the answer. Students should be able to describe how their basic fact knowledge is related to each problem and explain the product's shift to the left. Encourage students to demonstrate one or two problems with blocks to reinforce the idea of the "growing" product, as described in the Introduction.

Assessment

As students participate in the introductory discussion, observe and note:
Do they –
- Understand the relationships between 4 x 1, 4 x 10, and 4 x 100?
- Predict products of single digit numbers x 10 and x 100 with accuracy?
- Apply the commutative property of multiplication when determining 10 groups of 4 and 100 groups of 4?
- Extend the concepts above, modeling a single digit multiplied by a multiple of ten, *other* than 10 and 100? For example, 7 x 30 and 7 x 300?

As students play "Close Up" note:
Do they –
- Mentally compute products, rely on using the blocks, or are they somewhere "in between?"
- Identify the basic fact in order to name the product for each problem?
- Describe the shift of the digits with mathematical understanding?

Extensions

❑ Give students a game board and a set of fact cards. Have them match two facts for each space on the board.
❑ Have students create their own version of "Cover Up" using harder or easier facts.

Cover Up cards: Copy on colored paper (optional) to contrast with game board. Provide one set for every two players.

300 x 2	6 x 100	2 x 400	100 x 8	3 x 30	9 x 10	100 x 2	4 x 50	5 x 60
100 x 3	6 x 40	30 x 8	600 x 2	4 x 300	800 x 2	4 x 400	4 x 10	20 x 2

300 x 2	6 x 100	2 x 400	100 x 8	3 x 30	9 x 10	100 x 2	4 x 50	5 x 60
100 x 3	6 x 40	30 x 8	600 x 2	4 x 300	800 x 2	4 x 400	4 x 10	20 x 2

300 x 2	6 x 100	2 x 400	100 x 8	3 x 30	9 x 10	100 x 2	4 x 50	5 x 60
100 x 3	6 x 40	30 x 8	600 x 2	4 x 300	800 x 2	4 x 400	4 x 10	20 x 2

300 x 2	6 x 100	2 x 400	100 x 8	3 x 30	9 x 10	100 x 2	4 x 50	5 x 60
100 x 3	6 x 40	30 x 8	600 x 2	4 x 300	800 x 2	4 x 400	4 x 10	20 x 2

Cover Up game board: Provide one for each player.

600	240	90	800	1200	40	200	1600	300

90	800	600	240	1600	40	300	1200	200

800	40	240	300	1200	90	200	1600	600

Cover Up game board: Provide one for each player.

600	240	90	800	1200	40	200	1600	300

90	800	600	240	1600	40	300	1200	200

800	40	240	300	1200	90	200	1600	600