Title-Base-10 Multiplication Arrays

Lesson Summary This activity focuses on creating a conceptual understanding of multiplication of whole numbers. The students manipulate base 10 blocks to form arrays showing the products and factors of various multiplication problems.

Major Topic and SOL SOL 4.4 The student will multiply whole numbers.

Length of Lesson-One 60 minute class session

Student Objectives

In Mathematics the student will be able to: The student will be able to use base-10 blocks to solve and model multiplication problems. The student will understand how to trade/exchange units for rods and rods for flats when necessary to build their arrays.

In Language the students will be able to: The students will be able to work as a team to discuss their method of problem-solving using appropriate math language.

21st Century Skills

- Communication
- Collaboration
- Critical-thinking and problem-solving

Assessment Evidence

- The teacher will informally assess the students by monitoring the process of working in groups. The teacher will also monitor the students' models of arrays.

Supplies/Materials/Technology

- Base-10 blocks
- Calculators
- Whiteboard, expo markers
- Activboard
- Flipchart
- Math journals

Lesson Plan

Motivation & Building Background:

Students have previously modeled 1digit by 1digit arrays as they built their understanding of multiplication concepts.

- 1. TSW solve the Problem of the Day: A racecar driver raced 5 days a week. Each day, he had to replace 6 tires. How many tires did the racecar driver have to replace after 5 days? TSW draw a picture of an array to solve. Remember, arrays must be rectangular in shape.

- Students will share how they solved the problem with their math team. Students will discuss how they can solve the problem in more than one way. Example: a 5 by 6 array or a 6 by 5 array.

- Students will share how they solved the problem with the class. The teacher will model the arrays on the flipchart.
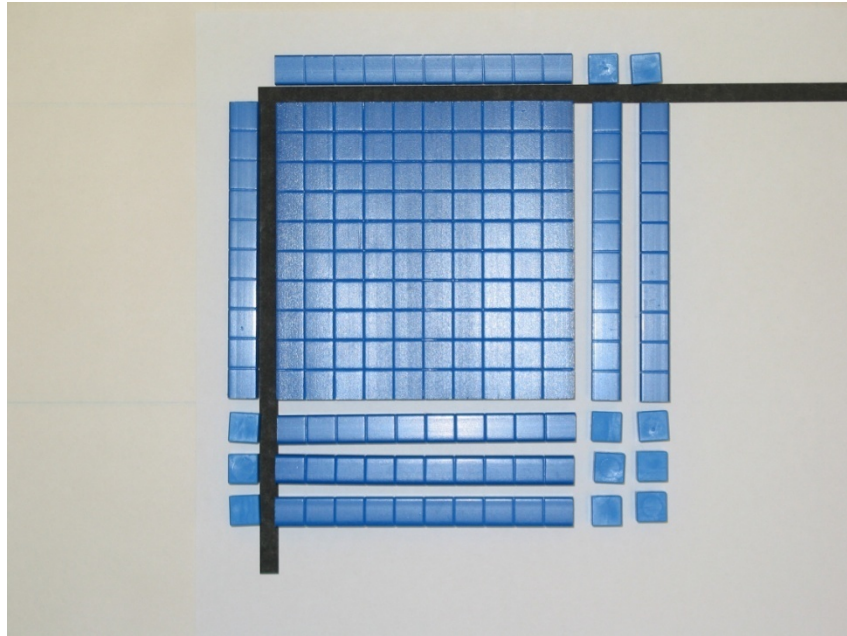
Presentation

- Discuss the learning goal with students. –Today we will use our base ten blocks to help us build and solve multiplication problems. We will build arrays to help us solve these problems.

Practice/Application

- 1. Review how to build a 13-by-2 rectangle with base-10 blocks. Begin by representing 13 with 1 rod and 3 units to correspond to the width of the rectangle. Then represent 2 with 2 units placed to correspond to the length of the rectangle. Remind students that they were able to find the product of 5 times 6 by completing a rectangle that was 5 units wide and 6 units long and that the same process can be used to find the product of two-digit factors. Ask students what blocks can be used to complete the 13-by-2 rectangle, using the fewest number of blocks. Model building an area model of this problem and solve.

- 2. Demonstrate how to build 13 x 10. Discuss which base 10 blocks we will need to use. Start with the largest blocks, the flats. Model placing the flat in the rectangle. Ask students, "What is 10x10?" Lead them to understand that they could use a flat. Next, ask how many units will fit in the remaining area. Ask students, "What is 3x10?" "I could use 30 units or 3 rods." Distribute the whiteboards, markers, and base 10 blocks. Model how to set up their white board. Allow students time to build the problem: 13 x 10.

- 3. Demonstrate how to find the product of 13 times 12, using the same process. Discuss which base 10 block we will need to use. Students should understand that it will be much easier to use a flat than building with rods. Have the students try with a partner and check together.

- 4. With a partner, students will build and find the product of 14 x 11. TSW record their answer on their whiteboard and check with a calculator.

- 5. With a partner, students will build and find the product of 12 x 13. TSW record their answer on their whiteboard and check with a calculator.
- 6. TTW model drawing a picture of 12x13 in boxes to record and organize this information. TSW copy this into their examples section of their math journal. The student can color code the partial products they get from the arrays. This will help wit the transition from pictorial representations to traditional procedures for multiplication.

	10	+	2	
100		20		
30		6		

10

+

3