

The Squares of Numbers in Multiplication

Grade Level: 2-3

OVERVIEW: As students begin memorizing the multiplication facts, they need many different ways of visualizing and practicing the multiplication concepts. They might begin practicing with arrays, skip counting, and moving manipulatives for the 0,1,2,3, and 4 times tables before they begin this lesson.

PURPOSE: It is easy enough for students to memorize $3 \times 3 = 9$, $4 \times 4 = 16$, etc. but this lesson gives a visual image for these simple patterns that will facilitate learning other patterns for the multiplication tables and extend to later math concepts.

OBJECTIVES: The learner will be able to:

- (1). Memorize the multiplication facts for a number times itself 1-10,
- (2) construct a visual image for these math facts,
- (3) label the shape created and predict the shape of other numbers using this pattern,
- (4) fill in a multiplication chart using the skills and answers from this activity.

RESOURCES/MATERIALS: Large paper, colored pencils, enlarged chart or chalk board.

ACTIVITIES AND PROCEDURES: The teacher explains that in addition when the same number was in the problem it was called a double, but in multiplication when a number is multiplied by itself it has a different name. Can we find what the label might be and why it is suitable? Pass out a large piece of paper with ten rows across and ten rows down to each student. The teacher works on an enlarged copy at the board. Each student and the teacher also need a marker. Choose a number from one to ten. Place the marker at the very top, left-hand corner of the large paper. Move down exactly that many boxes then across the given number of boxes. The area that appears inside the marker is the answer for how much that number equals when it is multiplied times itself. Count to identify. With a colored pencil, shade in this area. Choose another number one to ten and follow the same procedure until the pattern becomes apparent. A numerical answer may be recorded at the lower, left-hand side of each square. Write out a list of all the math facts 1-10 multiplied by itself and label the list MULTIPLICATION SQUARES.

TYING IT ALL TOGETHER: The student should observe that each time a number one through ten is multiplied by itself, the answer is a square. They can then predict that a two or three digit number times itself will also make a square. Later they can find square roots. Can the chart and marker be used to find other products and will the other products also be squares? If 5×5 is 25, what will 6×5 be? After

practicing and filling in the answers on the chart, the student will have a complete multiplication chart to be used meaningfully until the math facts are memorized.

SUGGESTIONS/MODIFICATIONS

- This lesson will work with just an enlarged copy at the board.
- Students should understand the importance of knowing the squares of numbers and be able to see their use in daily life.
- The teacher may want to make large signs of the multiplication problems and hang them throughout the room.

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