Square Roots

Strand: Number and Number Sense

Topic: Determining Square Roots

Primary SOL: 7.1 The student will
d) determine square roots of perfect squares

Materials

- Square Roots activity sheet (attached)
- Calculator
- Square Tiles

Vocabulary

exponent, perfect square, square (earlier grades)

square root, $\sqrt{}$ *(7.1)*

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Distribute the Square Roots activity sheet, and have the students construct squares (i.e., $1 \times 1, 2 \times 2, etc.$) using the square tiles. They should construct 20 square tiles. The number of tiles used to build the square is the area of the square. Students should complete the chart.

2. Explain to students that the dimensions of the number of tiles can be obtained from its construction and the square root of the area is the measurement of a side. Help students make connections as they complete the chart.

3. Explain that the square root of a number is one of its two equal factors. The completed chart on the activity sheet displays perfect squares from 0–400.

4. Give students some additional perfect squares, and ask them to determine the square root.

Assessment

- **Questions**
  - How can you create a definition for a perfect square, using tiles?
  - What is a square root?
  - Which number does not belong: 81, 99, 100, or 121? Why?

- **Journal/writing prompts**
  - Explain the difference between finding the square root and squaring a number.
  - Explain to a friend how to find the square root of a number.
  - Explain whether every number has a square root that is a whole number.
  - Explain the definition of the symbol $\sqrt{}$.

- **Other Assessments (include informal assessment ideas)**
  - Have students create a foldable for square roots and perfect squares.

      o Create an exit ticket about square roots for students to complete. Develop the questions based on the level of the student. Students must answer correctly to be allowed to exit the classroom.

Extensions and Connections (for all students)

- Have students continue the Square Roots activity sheet to find all of the perfect squares through 1,000.
- Have students make an analog clock using the square roots of perfect squares (1–144).

Strategies for Differentiation

- Use a hundreds chart to identify perfect squares by putting a square around each number and the numerical expression.
- Have students shade squares on graph paper instead of using square tiles.
- Provide more examples other than lines 1 and 2 on the Square Roots activity sheet.
- Have students draw representations of perfect squares on grid paper and identify their corresponding square root.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Name _____ **Date** _____

Number of Tiles (area of the square)	Dimensions of Number of Tiles	$\sqrt{area}$	Squares on a Side
0	0×0	0	$\sqrt{0} = 0$
1	1×1	1	$\sqrt{1} = 1$