Just In Time Quick Check

Standard of Learning (SOL) 7.1d

Strand: Number and Number Sense

Standard of Learning (SOL) 7.1d

The student will determine square roots of perfect squares.

Grade Level Skills:

- Identify the perfect squares from 0 to 400.
- Determine the positive square root of a perfect square from 0 to 400.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - 7.1d - Square Roots (Word) / PDF Version
- VDOE Algebra Readiness Formative Assessments
  - SOL 7.1d (Word) / PDF
- VDOE Algebra Readiness Remediation Plans
  - Square Roots (Word) / PDF
- VDOE Word Wall Cards: Grade 7 (Word) | (PDF)
  - Perfect Squares
  - Square Root
- Desmos Activity
  - Squares and Square Roots

Supporting and Prerequisite SOL: 6.4

SOL 7.1d - Just in Time Quick Check

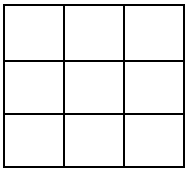
1) Determine the values that are perfect squares and the values that are not perfect squares. Justify your reasoning for each value.

Value	Perfect Square/Not Perfect Square	Justification
0		
50		
125		
200		
361		

2) Determine if the following statements are true or false. Justify your reasoning for each statement.

Statement	True or False	Justification
$\sqrt{9} = 81$		
$1^2 = 1$		
$13^2 = 196$		
$3 = \sqrt{6}$		

3) Consider the model.



Make a true statement by filling in values that represent the model.

$$\_\_\_\_\_ = \sqrt{\_\_\_\_\_}$$

4) Complete the table. Justify your reasoning.

Perfect Square	Square Root	Justification
25		
36		
	11	
	16	
324		
400		

SOL 7.1d - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1) In the table, determine which values are perfect squares and which are not perfect squares. Justify your reasoning for each value.

Value	Perfect Square/Not Perfect Square	Justification
0		
50		
125		
200		
361		

A common error students may make is assuming that even numbers are perfect squares because they can be divided by 2 to get a whole number. For example, the values of 50 and 200, when divided by two, provide students with whole numbers. Students may make the error of adding a number to itself to get the perfect square value instead of multiplying it by itself. Teachers should emphasize a square root is a repeated factor of the perfect square not a repeated addend. For example, 289 is a perfect square since $\sqrt{289} = \sqrt{17 \cdot 17} = 17$ *or* $17^2 = 17 \cdot 17 = 289$*. This shows the student the repeated factor of 17.*

Teachers should use graph paper or an area model to illustrate perfect squares giving students a concrete and pictorial representation of these concepts. The Desmos Activity is a tool to help students explore perfect squares and square roots further. However, on the state assessment, items measuring SOL 7.1d are assessed without the use of a calculator.

2) Determine if the following statements are true or false. Justify your reasoning for each statement.

Statement	True or False	Justification
$\sqrt{9} = 81$		
$1^2 = 1$		
$13^2 = 196$		
$3 = \sqrt{6}$		

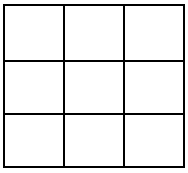
For the first statement, students may recognize there is a perfect square and square root relationship between the two values. However, students may need more understanding of what the radical means so they can recognize the placement of the 9 and 81 need to be reversed for it to be a true statement.

In the second and fourth statements, students may incorrectly multiply or divide the base and exponent and assume 1 squared equals 2 or divide 6 by 2 to get 3. Students may not understand the concept of an exponent and apply it as another factor or addend – demonstrating the misconception that raising a value to the second power means to multiply by 2 or, in some cases, adding 2 to the base.

For the third statement, students may transpose the perfect squares of 169 and 196 with the correct square roots.

Teachers should use graph paper or an area model to illustrate perfect squares giving students a concrete and pictorial representation of these concepts.

3) Consider the model.



Make a true statement by filling in values that represent the model.

$$\_\_\_\_\_ = \sqrt{\_\_\_\_\_}$$

A common error a student may make is reversing the placement of the 3 and the 9. This may happen if students always see the radical on the left side of the equation. Teachers should model statements written with the radical on the right side of the equation as well as on the left. In addition, students should practice creating statements to illustrate area models. The VDOE Mathematics Instructional Plan, 7.1d - Square Roots, uses a table to show the connection between perfect squares and their square roots. The Desmos Activity is a tool to help students explore this concept further. Teachers should use graph paper or an area model to illustrate perfect squares giving students a concrete and pictorial representation of these concepts.

4) Complete the table. Justify your reasoning.

Perfect Square	Square Root	Justification
25		
36		
	11	
	16	
324		
400		

A common error students may make for 11 or 16 is to multiply by 2 to get the perfect square.

A common error students may make for 16 is identifying 4 as the perfect square. Students may recognize there is a perfect square relationship between 4 and 16 but transpose the square root and perfect square as 16 is also a perfect square.

Teachers should provide students with matching games to help them to identify the perfect squares from 0 to 400 and to determine the positive square root of perfect squares from 0 to 400.