

Richmond Public Schools
Curriculum Framework
Grade 7 Honors (7/8)

Strand: Measurement and Geometry	
8.3	<p>The student will</p> <p>a) estimate and determine the two consecutive integers between which a square root lies; and</p> <p>b) determine both the positive and negative square roots of a given perfect square.</p>
7.1	<p>The student will</p> <p>d) determine square roots of perfect squares;* and</p>
Suggested Pacing	
Related Standards	
Spiral Down: 6 th Grade: <ul style="list-style-type: none"> • SOL 6.4 	Spiral Up: Algebra: <ul style="list-style-type: none"> • A.3a,b,c
Essential Questions	Common Misconceptions
<ul style="list-style-type: none"> • How can we locate rational numbers on a number line? • How do I use concrete materials and drawings to understand and show understanding of perfect squares and square roots? 	<ul style="list-style-type: none"> • Non-Perfect Squares: students get confused about determining the two whole numbers or integers the square root falls between (plotting on a number line will assist)
Understanding the Standard	Essential Knowledge and Skills
SOL 8.3: <ul style="list-style-type: none"> • A perfect square is a whole number whose square root is an integer. • The square root of a given number is any number which, when multiplied times itself, equals the given number. • Both the positive and negative roots of whole numbers, except zero, can be determined. The square root of zero is zero. The value is neither positive nor negative. Zero (a whole number) is a perfect square. 	SOL 8.3: <ul style="list-style-type: none"> • Estimate and identify the two consecutive integers between which the positive or negative square root of a given number lies. Numbers are limited to natural numbers from 1 to 400. (a) • Determine the positive or negative square root of a given perfect square from 1 to 400. (b) 7.1d:

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- The positive and negative square root of any whole number other than a perfect square lies between two consecutive integers (e.g., $\sqrt{57}$ lies between 7 and 8 since $7^2 = 49$ and $8^2 = 64$; $-\sqrt{11}$ lies between -4 and -3 since $(-4)^2 = 16$ and $(-3)^2 = 9$).
 - The symbol $\sqrt{}$ may be used to represent a positive (principal) root and $-\sqrt{}$ may be used to represent a negative root.
 - The square root of a whole number that is not a perfect square is an irrational number (e.g., $\sqrt{2}$ is an irrational number). An irrational number cannot be expressed exactly as a fraction $\frac{a}{b}$ where b does not equal 0.
 - Square root symbols may be used to represent solutions to equations of the form $x^2 = p$. Examples may include:
 - If $x^2 = 36$, then x is $\sqrt{36} = 6$ or $-\sqrt{36} = -6$.
 - If $x^2 = 5$, then x is $\sqrt{5}$ or $-\sqrt{5}$.
 - Students can use grid paper and estimation to determine what is needed to build a perfect square. The square root of a positive number is usually defined as the side length of a square with the area equal to the given number. If it is not a perfect square, the area provides a means for estimation.
- 7.1d:
- A perfect square is a whole number whose square root is an integer. Zero (a whole number) is a perfect square. (e.g., $36 = 6 \cdot 6 = 6^2$).
 - A square root of a number is a number which, when multiplied by itself, produces the given number (e.g., $\sqrt{121}$ is 11 since $11 \cdot 11 = 121$).
 - The symbol $\sqrt{}$ may be used to represent a non-negative (principal) square root. Students in grade 8 mathematics will explore the negative square root of a number, denoted $-\sqrt{}$.
 - The square root of a number can be represented geometrically as the length of a side of a square.
 - Squaring a number and taking a square root are inverse operations.
- Identify the perfect squares from 0 to 400. (d)
 - Determine the positive square root of a perfect square from 0 to 400. (d)

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Vocabulary			Instructional Activities Organized by Learning Objective									
SOL 8.3: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Perfect Square</td> <td style="width: 33%;">Integers</td> <td style="width: 33%;">Square Roots</td> </tr> <tr> <td>Radical</td> <td>Root</td> <td>Squared</td> </tr> <tr> <td>Whole Number</td> <td></td> <td></td> </tr> </table>			Perfect Square	Integers	Square Roots	Radical	Root	Squared	Whole Number			Textbook Notes Resources <ul style="list-style-type: none"> ● Print ● Technology-based Station Activities
Perfect Square	Integers	Square Roots										
Radical	Root	Squared										
Whole Number												
SOL 7.1d: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Perfect Square</td> <td style="width: 33%;">Square Root</td> <td style="width: 33%;">Radical</td> </tr> <tr> <td>Squared</td> <td></td> <td></td> </tr> </table>			Perfect Square	Square Root	Radical	Squared						
Perfect Square	Square Root	Radical										
Squared												
Assessment												
Cross-Curricular Connections			Tiered Differentiations									