***INTRODUCTION:*** Students are introduced to irrational numbers and are able to differentiate between rational and irrational numbers, as well as estimate the approximate value of irrational numbers.

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| **Grade 8 Math: The Number System** |
| **Duration: 2 weeks****Topics covered: Rational Numbers, Irrational Numbers** |
| **Common Core Learning Standards:*** 8.N.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers, show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
* 8.N.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions. *For example, by truncating the decimal expansion of* $\sqrt{2}$ *, show that it is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*

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| **BIG IDEAS/ENDURING UNDERSTANDINGS:*** *Rational numbers can be expressed as a fraction or repeating decimal*
* *Irrational numbers are non-repeating, non-terminating decimals.*
* *Irrationals numbers can be located approximately on a number line by estimating the value using perfect squares as benchmarks.*
 | **ESSENTIAL QUESTIONS:*** What is the difference between rational and irrational numbers?

 * How can you determine if a number is irrational?

 * How can you find the approximate value of an irrational number?
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| **CONTENT:** |
| *Subunit*: **Rational Numbers*** square roots
* Perfect squares
* Cube roots
 | *Subunit*: **Irrational Numbers*** Roots of non-perfect squares
* Approximation of irrational numbers on a number line

  | *Subunit*: **Comparing real numbers*** Rational vs. Irrational
* Ordering real numbers on a number line

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| **SKILLS AND PRACTICES:** * Find the square and cube roots of perfect squares and perfect cubes
* Use square roots to solve an equation.
* Estimate square roots
* Estimate cube roots
* Classify numbers as being irrational or rational
* Compare two real numbers that are either rational or irrational (less than, greater than, or equal)
* Order real numbers on a number line
* Justify the reasonableness of a number approximation of an irrational number
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| **VOCABULARY / KEY TERMS:** Perfect square, square root, radical sign, perfect cube, cube root, rational numbers, irrational numbers, real numbers, equation, solving  |
| **ASSESSMENT EVIDENCE AND ACTIVITIES** |
| Balanced Assessment: “Greater, Lesser, or In Between”http://balancedassessment.concord.org/m020.html |  | Grade 8 Number Sense Performance Task |
| **LEARNING PLAN AND ACTIVITIES** |
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| **Resources:** |