

## NJDOE MODEL CURRICULUM PROJECT

|                           |          |           |                              |
|---------------------------|----------|-----------|------------------------------|
| CONTENT AREA: Mathematics | GRADE: 8 | UNIT #: 2 | UNIT NAME: The Number System |
|---------------------------|----------|-----------|------------------------------|

| #        | STUDENT LEARNING OBJECTIVES                                                                                                                                                                                                                              | CORRESPONDING CCSS |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>1</b> | Compare rational and irrational numbers to demonstrate that the decimal expansion of irrational numbers do not repeat; show that every rational number has a decimal expansion which eventually repeats and convert such decimals into rational numbers. | 8.NS.1             |
| <b>2</b> | Use rational numbers to approximate and locate irrational numbers on a number line and estimate the value of expressions involving irrational numbers.                                                                                                   | 8.NS.2             |
| <b>3</b> | Apply the properties of integer exponents to simplify and write equivalent numerical expressions.                                                                                                                                                        | 8.EE.1             |
| <b>4</b> | Use scientific notation to estimate and express the values of very large or very small numbers and compare their values (how many times larger/smaller is one than the other).                                                                           | 8.EE.3             |
| <b>5</b> | Perform operations using numbers expressed in scientific notation, including problems where both decimals and scientific notation are used (interpret scientific notation generated when technology has been used for calculations).                     | 8.EE.4             |
| <b>6</b> | In real-world problem solving situations choose units of appropriate size for measurement of very small and very large quantities.                                                                                                                       | 8.EE.4             |

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

**Bold type indicates grade level fluency requirements.** (Identified by PARCC Model Content Frameworks).

### Selected Opportunities for Connection to Mathematical Practices

1. **Make sense of problems and persevere in solving them.**  
SLO 6 Use problems that describe complex real-world conditions.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.

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5. Use appropriate tools strategically.
- 6. Attend to precision.**  
SLO 6 Determine appropriate sized units for a given context.
- 7. Look for and make use of structure.**  
SLO 3 Examine the form of expressions involving integer exponents and apply the correct property of exponents to create equivalent expressions .
- 8. Look for and express regularity in repeated reasoning.**  
SLO 1 Explain orally or in written language the difference between a rational and an irrational number.
- All of the content presented at this grade level has connections to the standards for mathematical practices.*

***Bold type identifies possible starting points for connections to the SLOs in this unit.***

| Code #        | Common Core State Standards                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>8.NS.1</b> | 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.                                                                                                                                      |
| <b>8.NS.2</b> | 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. <i>For example, by truncating the decimal expansion of the square root of 2, show that the square root of 2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.</i>             |
| <b>8.EE.1</b> | Know and apply the properties of integer exponents to generate equivalent numerical expressions.                                                                                                                                                                                                                                                                                                                               |
| <b>8.EE.3</b> | Use numbers expressed in the form of a single digit times an integer power of 10 estimate very large or very small quantities, and to express how many times as much one is than the other. <i>For example, estimate the population of the United States as <math>3 \times 10^8</math> and the population of the world as <math>7 \times 10^9</math> and determine that the world population is more than 20 times larger.</i> |

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**8.EE.4**

Perform operations with numbers expressed in scientific notation, including problems where both decimals decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

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