**Title:** Rationalizing Irrational Numbers

**Description:** This lesson focuses on differentiating between numbers that are rational and which are irrational. Rational and irrational are opposites of one another. Therefore if a number is rational it cannot also be irrational and vice versa. A value is rational if and only if it can be written as a fraction. There are no exceptions to this rule. If a value cannot be written as a fraction then it is not rational, hence it is irrational. Students will see that the irrational numbers when in decimal form are “unfriendly” never-ending, non-repeating decimals (hence the reason they can’t be converted into a fraction.)

**Introduction:** Students will need to come into the lesson with knowledge about fractions. Students need to have a strong understanding about how, for example, the number 7 can be written as a fraction, 7/1. Students need to be able to convert decimals to fractions and fractions to decimals. This lesson is designed to fit in a 50 minute period, however the ability level and ease of understanding of the class as a whole will vary from period to period. Students will understand why irrational numbers are important.

**Learning Objectives:**

Students will be able to:

-Define the terms rational & irrational number.

-Explain the differences between rational and irrational numbers

-Identify irrational numbers from a list of values.

-Understand why irrational numbers are important.

**Guided Question:** What makes an irrational number irrational?

**Materials:**

-One calculator for each student (to enable them to view the “unfriendly” decimals)

- One student response clicker for each student

-SmartBoard

**Procedures:**

- The teacher will begin the lesson by presenting different scenarios where irrational numbers appear and are vital. Irrational numbers are not to be ignored or substituted for rational numbers.

Consider: Measurement – building a house. You don’t want the refrigerator to not fit between the cabinets because the handyman estimated. Exactness – You don’t want the space shuttle to experience issues because an engineer rounded the decimal. Precision – You want to be 100% confident that the arrow will pierce the apple sitting on your head and not your eye!

- The teacher will use the SmartBoard throughout the entire lesson as well as the student response clickers.

* The class will begin discovering the definitions of rational and irrational numbers.
* Next the class will categorize a group of numbers as either rational or irrational.
* Then the each student will respond in their clicker to different numbers, stating whether they are rational or irrational.
* Each student must then come up with their own rational and irrational numbers (2 each). They will then partner up and switch numbers. The student will have to determine if their partner did come up and correctly designate rational and irrational numbers.
* The teacher will then have an exit slip asking if pi and 1/7 are rational or irrational.
* The homework is assigned.

**Assessment:** Homework from the corresponding section in the textbook.

**Answer Key or Rubric:** See teacher version of textbook.

**Benchmark or Standards:**

Process Standard: Communication

NGSSS: MA.912.A.1.1 - Know equivalent forms of real numbers (including integer exponents and radicals, percents, scientific notation, absolute value, rational numbers, irrational numbers).