

Lesson 4-7: The Real Numbers Day 2

1. Benchmarks/Standards:
 - a. CCSS.MATH.CONTENT.8.NS.A.1
Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers, demonstrate that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
 - b. CCSS.MATH.CONTENT.8.NS.A.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 (e.g., π^2). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.
2. Learning Target(s):
 - a. I can classify numbers.
3. Anticipatory Set:
 - a. Estimation 180- <http://www.estimated180.com/day-176.html>
 - b. The students will answer the following question: How long will it take Mr. Stadel to walk across the court?
 - i. On their shape sheets, the students will write a low estimate, high estimate and their exact estimate.
 - ii. The teacher will ask for volunteers to share their answers for each part and have the students share their reason.
 - iii. The teacher will demonstrate to the student's the distance Mr. Stradel walked across the basketball court.
4. Behavior Objective/Essential Question:
 - a. How does an understanding of classifying numbers help students with expression and equations?
5. Input:
 - a. Task Analysis:
 - i. Homework check on Monday's Book Problems on page 197 (Problems 5-59 odds)
 1. The teacher will read out the answers to the students while they check their homework. Any student questions will be discussed after all of the answers have been disclosed.
 2. The teacher will work out any problem the student(s) would like to review.
 - b. Human plotting Real Numbers on the Number line Activity
 - i. The activity will take place outside of the classroom on the sidewalk. The number line will be pre-drawn with chalk to use for the three hours of math 8A.
 - ii. Each student will be given a notecard from the given set.

- iii. The objective of this activity is to have the students construct a human plot line with their real numbers and find the exact placement on the number line between -10 and 10.
 1. The students will have to figure out what integers and other rationales/irrational numbers.
- iv. Once the class has determined the placement, the teacher will start the discussion on how the students determined their location on the number line and how they know where their real number was located on the number line.
 1. How could the student determine the order and compare two different rational/irrational/integers?
- c. Once the discussion and activity is done, the students will return to their classroom to have a discussion of classifying numbers.
 - i. The students will review what number they are and get in groups of like classified numbers (Natural, whole, integers, rational, irrational)
 - ii. The students will go to the teacher to receive their classified sign.
 - iii. The only sign that the teacher will have left is a real number and a non-real number sign.
 1. "Why isn't anyone taking this sign?"
 - iv. The teacher hopes they will organize themselves in the different classification(s) of numbers.
- d. Once the students are able to determine which classification numbers they are and identify that they all belong to the real numbers family, the students will work on their book problems on classifying numbers: Lesson 4-7 page 197 Problems 6-60 (even) for the remainder of the hour.
- e. Thinking Levels:
 - i. Knowledge: What are natural numbers, whole numbers, integers, rational numbers, irrational numbers and non-real numbers? What numbers make up the real numbers?
 - ii. Comprehension: Why isn't anyone taking the real and non-real number sign?
 - iii. Application: Applying their understanding of real numbers and human plotting on the number line.
 - iv. Analysis- Compare/Contrast the difference between what are the similarities and differences between the different classifications?
- f. Learning Styles:
 - i. Auditory- direct instruction, class discussion
 - ii. Kinesthetic- Human Plotting on a number line and organizing into the different types of real numbers.
 - iii. Visual- Human Plotting and grouping into the different types of real numbers
- g. Methods and Materials:
 - i. Ways of Presenting:
 1. Direct Instruction, Small groups, Group Discussion

- ii. Materials needed:
 - 1. Socrative.com- Socrative Student Login (<http://b.socrative.com/login/student>) and Teacher Login (<http://b.socrative.com/teacher/#dashboard>), Socrative Classroom login (JJH28)
 - 2. Sidewalk Chalk
 - 3. Set of 32 notecards for real numbers
 - 4. Set of classifying numbers
 - 5. Lesson 4.7 Book Problems p 195-198: 6-60 even (Book Problems from Holt McDougal Mathematics Course 3)
- 6. Modeling:
 - a. Pick out a problem from the previous homework to reiterate a main conception and/or misconception from the previous class day.
 - i. The students will have the teacher work out a problem they like to review on the board from the previous night's homework (Problems 5-59 odds on page 198 in their textbook).
 - b. The students will organize into the different classifications of real numbers and the class will discuss how they know they are in the correct classification.
- 7. Check for Understanding:
 - a. Formative Assessment
 - i. The teacher will ask the complete an exit ticket using socrative.com. The students will login into their classroom and submit their response on the following question(s):
 - 1. How well did you understand today's material?
 - a. Totally got it
 - b. Pretty well
 - c. Not very well
 - d. Not at all
 - 2. What did you learn in today's class?
 - a. Students will summarize what they learned.
 - 3. Further questions?
 - a. Students will ask any questions about the real numbers and classifying numbers.
 - b. Various Questioning Techniques
 - i. Deeper Level of Knowledge- Explain, How, Why?
 - 1. Encourage the students to share how they would solve the problems.
 - 2. Is this the only way to identify the classification number?
- 8. Independent Practice:
 - a. The students will complete their homework assignment, practicing on how to classify real and non-real numbers.
 - i. Lesson 4.7 Book Problems p 195-198: 6-60 even (Book Problems from Holt McDougal Mathematics Course 3)

9. Closure:

- a. The teacher will have the students to use their educational devices (socrative.com) to answer the exit ticket questions: The students will login into their classroom and submit their response on the following question(s):
 - i. How well did you understand today's material?
 1. Totally got it
 2. Pretty well
 3. Not very well
 4. Not at all
 - ii. What did you learn in today's class?
 1. Students will summarize what they learned.
 - iii. Further questions?
 1. Students will ask any questions about the real numbers and classifying numbers.