

Rational Numbers

Lesson Overview

During this lesson, students will learn the value of the mathematical practices in applying their understanding of adding and subtracting rational numbers. Students will read an article about rational numbers and use the GIST strategy to formulate a definition for rational numbers.

Standards Addressed

- 7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
- MP.3 Construct viable arguments and critique the reasoning of others.
- MP.6 Attend to precision.
- MP.7 Look for and make use of structure.

Disciplinary Literacy Best Practices

GIST Summaries

Table Talk

Highlighting

Venn diagram

Lesson Plan

Time Required – One 65-minute Class Period

Disciplinary Vocabulary : rational numbers, integers, irrational numbers, absolute value, square root, square number, fraction, decimal, percent

Materials Needed:

- Index card with a number (one per student)
- Rational Number article (<http://www.quickanddirtytips.com/education/math/what-are-irrational-numbers>)

Assessment: Completed Venn Diagram

Engage

- Brain Pop video: Rational and Irrational Numbers (<http://www.brainpop.com/math/numbersandoperations/rationalandirrationalnumbers/preview.weml>)

Explore and Explain

- Teacher will set the purpose for reading: “To be able to describe in detail what a rational number is.”
- Students will explore the definitions of rational and irrational numbers through a close reading of the article “What are Irrational Numbers?”, as well as reading explanations in the mathematics text book. As students read, they will take notes in their math notebook on important information, key vocabulary, and examples.
- Students will use the GIST strategy to summarize their reading.
 - GIST: Write a summary of each section in 20 words or less. Combine the GIST statements for each section of the text into a concise summary of the material.
- Teacher will draw a Venn diagram on the board with three overlapping circles. Circles will be labeled integers, rational numbers, and irrational numbers. Students should also draw a similar Venn diagram in their math notebook. . Provide a list of numbers on the board. In small groups, students discuss the placement of the numbers on the Venn diagram. Distribute index cards, one per student, with the same numbers from the list on the board on them (one number per index card.) Students will attach their index card (using tape) to the class Venn diagram and explain the reason for placement in the category chosen. Student groups should self-assess their previous organization as the index cards are added to the board, using a different color to correct any previous misplacement.
- Note: When students misplace a card, or other students disagree, an opportunity for authentic discussion arises and the teacher should question students to help them develop skill in mathematical argument.

Extend

- Optional Notebook Reflections:
 - Why is $\sqrt{2}$ irrational?
 - Where do you use rational numbers in your every day life?

Lesson Assessment:

- Completed Venn diagrams
- Next Day Warm-Up: Provide three Venn diagrams on the board with a specific number written above each. Each student places a sticker or note where the number falls in the Venn diagram (student should write integer, irrational, or rational on the sticker along with their name.)

Teacher Reflections and Biographical Information

Students need to come to the conclusion that all integers are rational numbers, but not all rational numbers are integers. Also, irrational numbers will never be integers but can be negative.

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