Rational Numbers in Expressions and Equations

Real Numbers

Rational or Irrational

Rational $\frac{7}{9}$ $\frac{3}{2}$ 1.4

- Integers -2, -1, 0, 1, 2
  - Whole Numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9
    - Natural Counting Numbers

Numbers we can say exactly

Irrational: numbers that are not rational

In decimal form, a number that doesn't repeat or end

example

π (pi) ≈ 3.14159... ellipsis

Expressions (looks like) Equations

Expressions

① Numerical

5-9   3+7
4(-6) $\frac{6}{2}$

Illustrated

______ has $5 in her pocket, but she wants to buy ______ for $9.

② Algebraic

x+4   7c-6
4(y+7)   5(x+3)-7

Illustrated

______ has a bill in his pocket. His friend gave him back the $4 he owed him.

Equations

① Numerical

5-9 = 6-2
8 = 18-10
4+3 = 9-2

Illustrated

Find the sum of 4 and 3, set equal to the difference of 9 and 2.

② Algebraic

2[1-(x+3)] = -2x-4
7+y = 3x3

Illustrated

Add 3 to x, subtract the result from 1, then double what you have to equal -2x-4.

terms

7x - 3

coefficient → 7; variable → x; variable term → 7x; constant → 3

Equalities

→ where two expressions or quantities are equal

example

2(x+4) = 2x+8

Inequalities

→ more than one solution to make a true statement

example

x - 2 > 5

Standards + Mathematical Practices

We will demonstrate quantitative reasoning by representing and solving real world problems using visuals, equations, and inequalities.

We will model an understanding of expressions, equations, and inequalities using tools such as algebra tiles/blocks, counters, and visuals to represent real world situations.

We know...

Inquiry

Rational Numbers In Expressions & Equations

We want to learn...

AIM4S³ ™

UNIT PLANNING TOOL What real-world situations can be represented by + & − of rational #'s

Unit Grade 7 : Expressions & Equations

CCSSM:
7.EE.1-4 ① expand linear expressions ② rewrite expressions ③ solve multi-step real-life & mathematical prob. w +/− integers. ④ use variables to represent quantities
7.NS.1-3 ① apply & extend +/− to rational numbers ② apply & extend ×/÷ to rational numbers ③ solve real-world prob (fractions) w/ +, −, ×, ÷ w/rational #s

Essential Question(s):
How will understanding the principles of algebra help me in real world situations?

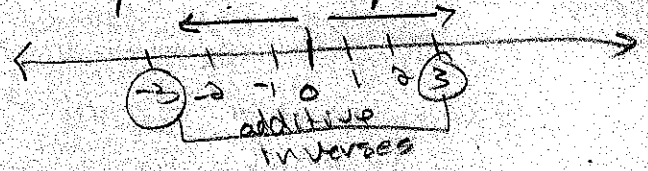
Pre and Post Assessments

Metacognition Boxes
- integers
- expressions
- equations
- rational numbers

SE Learning Task
Georgia Department of Education
www.georgiastandards.org

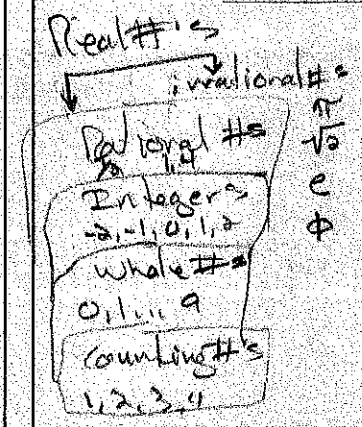
Key Concepts

p + q located |q| from p



real numbers
rational irrational

Visual Models of Concepts

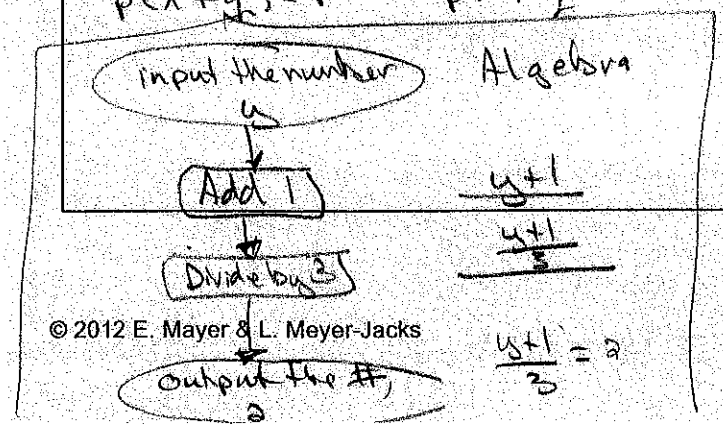


PEMDAS

Algorithms/Diagrams

p − q = p + (−q)

px + q = r px + q > r
p(x + q) = r px + q < r



Algebra

Connections (Real World Applications)

money
elevation
temperature
algebra — graphing equations
interpreting change mathematically
finance - money market, stocks
business - calculate loses, profits, cost
science - global warming, environmental changes
medical
engineering
higher levels of math

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Language Functions/Structures

Expressions are different than equations because _____

_____ are examples of rational numbers because _____

The difference between equalities and inequalities is _____

Vocabulary

rational numbers
integers
natural numbers
real numbers
equation
algebraic expressions
numerical expressions
constant
variable
term
variable term
inequality
quantities
coefficient
distributive prop
commutative prop
associative prop.

Focus and Motivation

Literature

"Less than Zero"
by S. Murphy

"One Grain of Rice"
by Demi

Animation

BrainPop - Inequalities
Equations w/ variables
+/- integers

Guess my number

* My number times 25 will equal 100. What is my number?
* 15 divided by my number will equal 5. What is my number?

StudyJams - Integers
- Creating Equations w/ Word Problems
- Order of Operations
- Number Patterns
- Determine the Missing Operation in an Equation
- +/- Equations

Metacognitive Boxes
integers, absolute value, algebraic expressions
algebraic equations