Number and Operations

Goal: The learner will understand and compute with rational numbers

Objective:

1.04 Develop fluency in addition, subtraction, multiplication, and division of nonnegative rational numbers.

a) Analyze computational strategies.

b) Describe the effect of operations on size.

c) Estimate the results of computations.

d) Judge the reasonableness of solutions.

To achieve this objective, students should:

- Understand fractions as a part-whole relationship.
- Explore the relationship between two numbers and their product to generalize the conditions under which the product is greater than both factors, between the factors, or less than both factors.
- Use 0, $\frac{1}{2}$, 1, $1\frac{1}{2}$, 2 and so on as benchmarks to make sense of the size of a sum, difference, product or quotient.
- Develop strategies to estimate the results of fraction and decimal operations.
- Make sense of whether a situation requires an overestimate or an underestimate.
- Examine the patterns of quotients (products) when numbers are divided (multiplied) by powers of 10.
- Develop ways of modeling addition and subtraction of fractions and decimals.
- Develop ways of modeling multiplication of fractions and decimals, including use of the area model.
- Develop ways of modeling division of fractions and decimals.
- Use inverse operations to develop an understanding of the relationship between addition and subtraction or multiplication and division of nonnegative rational numbers. *For example: 8 divided by 2 is equivalent to the product of 8 and one-half.*
- Understand that the product of a positive rational number and its multiplicative inverse (reciprocal) is 1.
- Use patterns and/or models to develop algorithms for fraction and decimal operations.
- Apply knowledge of decimal and fraction operations to solve problems.