

Richmond Public Schools

Curriculum Framework

7th Grade Math

Strand: Computation and Estimation

7.2 The student will solve practical problems involving operations with rational numbers.

Suggested Pacing

First Nine Weeks- 8 Instructional Days

Spiraling Standards

Spiraling Down:

- 6.5** The student will
- a) multiply and divide fractions and mixed numbers;
 - b) solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of fractions and mixed numbers; and
 - c) solve multistep practical problems involving addition, subtraction, multiplication, and division of decimals.
- 6.6** The student will
- a) add, subtract, multiply, and divide integers;*
 - b) solve practical problems involving operations with integers;
 - c) simplify numerical expressions involving integers.*
- 5.4** The student will create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers.

Spiraling Up:

- 8.4** The student will solve practical problems involving consumer applications.

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5.5 The student will
b) create and solve single-step and multistep practical problems involving addition, subtraction, and multiplication of decimals, and create and solve single-step practical problems involving division of decimals.

5.6 The student will
a) solve single-step and multistep practical problems involving addition and subtraction with fractions and mixed numbers; and
b) solve single-step practical problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction, with models.

4.4 The student will
d) create and solve single-step and multistep practical problems involving addition, subtraction, and multiplication, and single-step practical problems involving division with whole numbers.

4.5 The student will
b) add and subtract fractions and mixed numbers having like and unlike denominators; and
c) solve single-step practical problems involving addition and subtraction with fractions and mixed numbers.

4.6 The student will
a) add and subtract with decimals; and
b) solve single-step and multistep practical problems involving addition and subtraction with decimals.

Essential Questions

Common Misconceptions

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How can estimation help us accurately solve questions involving multiplication and division of decimals?

When working with decimals, estimation is a great place to begin as it shows us what the reasonable range for a solution looks like.

How important are estimations in real life situations?

In some situations, an estimation is as useful as an exact answer. For example, we use estimation when in the grocery store to make sure we are staying on budget.

How does converting between fraction/decimal/percent help make numbers more manageable?

In order to compare and combine fractions, decimals and percents, you first need to convert them all to the same form.

When is fraction the most convenient representation? Decimal? Percent?

Fractions are best to use when talking about part of a group, decimals are the best representation of money, and percents are best to use when using pie graphs and talking about sales and tax.

How can operations with integers be illustrated in multiple ways?

This can be demonstrated through the use of patterns and models.

- Students are often confused as to which operation match the key words in the problem.
- Students are not able to convert improper fractions.
- Students do not find the common denominator when adding or subtracting fractions.
- Students may not add numbers with opposite signs correctly, or are unable to work with multiple negatives.
- Students do not multiply to find the percent of a number.
- Students incorrectly convert between decimal, fraction and percent.
- Students forget to line up decimals when adding/subtracting and move decimal when multiplying/dividing decimals

Understanding the Standard

Essential Knowledge and Skills

- The set of rational numbers includes the set of all numbers that can be expressed as fractions in the form $\frac{a}{b}$ where a and b are

The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to

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<p>integers and b does not equal zero. The decimal form of a rational number can be expressed as a terminating or repeating decimal. A few examples of rational numbers are: $\sqrt{25}$, $\frac{1}{4}$, -2.3, 82, 75%, $4.\overline{59}$.</p> <ul style="list-style-type: none"> • Proper fractions, improper fractions, and mixed numbers are terms often used to describe fractions. A proper fraction is a fraction whose numerator is less than the denominator. An improper fraction is a fraction whose numerator is equal to or greater than the denominator. An improper fraction may be expressed as a mixed number. A mixed number is written with two parts: a whole number and a proper fraction (e.g., $3\frac{5}{8}$). A fraction can have a positive or negative value. • Solving problems in the context of practical situations enhances interconnectedness and proficiency with estimation strategies. Practical problems involving rational numbers in grade seven provide students the opportunity to use problem solving to apply computation skills involving positive and negative rational numbers expressed as integers, fractions, and decimals, along with the use of percents within practical situations. 	<ul style="list-style-type: none"> • Solve practical problems involving addition, subtraction, multiplication, and division with rational numbers expressed as integers, fractions (proper or improper), mixed numbers, decimals, and percents. Fractions may be positive or negative. Decimals may be positive or negative and are limited to the thousandths place.
Vocabulary	Instructional Activities Organized by Learning Objective
Rational Numbers Percents Fractions Improper Fractions Reciprocal Mixed Numbers Integers Words to Describe Positive Rational Numbers Words to Describe Negative Rational Numbers	VDOE Not available Textbook Virginia Math Connects, Course 2, ©2012, Glencoe/McGraw-Hill page(s) 4 - 12, 86-98, 102 –115, 139-165, 168-173, 318 - 341(in part) Notes - Can You Figure This Out?

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<p>Opposites Zero Pairs Common Denominator Sum Difference Product Quotient Operations Numerical Expressions</p>	<p>Resources</p> <ul style="list-style-type: none"> ● Print <ul style="list-style-type: none"> ○ Virginia Coach, New SOL Edition, Mathematics, Grade 7, @2018, Triumph Learning pg(s) 46 - 58, 66 - 67 ● Technology-based <ul style="list-style-type: none"> ○ Smart Exchange <ul style="list-style-type: none"> ■ Word Problems Connect 4 ○ QR Codes <ul style="list-style-type: none"> ■ Word Problem QR Code Activity ○ Shmoop <ul style="list-style-type: none"> ■ Rational Number Word Problems <p>Stations Working with Fractions (Algebra Readiness) pg(s) 16 - 21, 22 - 25, 28(in part)</p>
<p>Assessment</p>	
<p>Power School Assessment 7.2</p>	
<p>Cross-Curricular Connections</p>	<p>Tiered Differentiations</p>
<p>Science – Real World Connection: Virginia Math Connects, Course 2, ©2012, Price, et al, McGraw-Hill School Education Group , page 115</p> <p>Computer Science – Excel can be used as a tool to solve and visualize practical problems involving rational numbers.</p>	<p>Adding and Subtracting Fractions (Tier 1) Students will be given problems involving deposits and withdrawals and asked to find the ending balance after multiple transactions using decimals. (Tier 2) Students are asked to add fractions and decimals, as well as fractions with unlike denominators. (Tier 3) Give students fractions with unlike denominators and ask them to extend the fractions in arithmetic form until they can identify the fractions with common denominators. Once they have identified the common denominators, ask students to add and subtract them.</p>

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