Section 2.1: Rational Numbers Notes

POD: Compare. Use >, <, or = to complete each statement.

1.) $-5 > -8$ 2.) $-2 < -1.5$

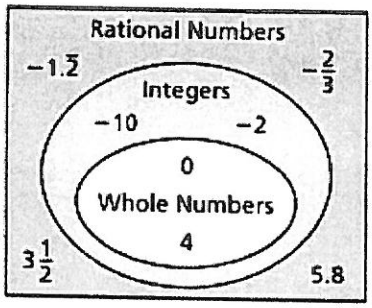
Objective: Students will be able to order, compare, and convert rational numbers into decimals and fractions.

Vocabulary:

Rational Number: A number that can be written as the ratio of two integers

Terminating Decimal: A decimal that ends

Repeating Decimal: Decimal that has a repeating pattern.



Examples: Write the rational number as a decimal

1.) $\frac{5}{6} = 0.8\overline{3}$	2.) $-5\frac{5}{11} = -5.\overline{45}$	3.) $-2\frac{1}{4} = -2.25$

Examples: Write the decimal as a fraction in simplest form

4.) $0.28 = \frac{28}{100}$ Divide by 4 $= \frac{7}{25}$	5.) $0.125 = \frac{125}{1000}$ Divide by 125 $= \frac{1}{8}$	6.) $-11.35 = -11\frac{35}{100}$ Divide by 5 $= -11\ \frac{7}{20}$

Examples: Compare using >, <, or =

7.) -2.2 ____ -2.42 >	8.) -1.82 ____ -1.81 <	9) $-5\frac{3}{11}$ ____ $-5.\overline{2}$ <

10.) The table shows the elevations of four sea creatures relative to sea level. Which of the sea creatures are deeper than the whale? Explain.

Convert all to decimals to compare:

Creature	Elevations (km)
Anglerfish	$-\frac{13}{10}$
Squid	$-2\frac{1}{5}$
Shark	$-\frac{2}{11}$
Whale	-0.8

Decimal
Anglerfish: -1.3
Squid: -2.2
Shark: -0.18
Whale: -0.8

The squid and the angler fish are deeper than the whale because they are -2.2 and -1.3.

Section 2.2: Adding Rational Numbers Notes

POD: Compare. Convert both fractions to a common denominator.

1.) $\frac{3}{4} < \frac{5}{6} = \frac{9}{12} < \frac{10}{12}$

2.) $\frac{2}{3} < \frac{4}{5} = \frac{10}{15} < \frac{12}{15}$

Objective: Students will be able to add rational numbers.

Rules for adding fractions with different denominators:

1. Find their least common denominator.
2. Change the fractions according to their least common denominators.
3. Add or subtract the numerators.
4. Keep the common denominator.
5. Simplify.

Examples:

1.) $\frac{3}{4} + \frac{1}{6} =$

$\frac{9}{12} + \frac{2}{12} = \frac{9+2}{12} = \frac{11}{12}$

2.) $\frac{1}{3} + (-\frac{4}{5}) =$

$\frac{5}{15} + (-\frac{12}{15}) = -\frac{7}{15}$

3.) $-1\frac{1}{5} + -\frac{1}{2} =$

$-\frac{6}{5} + -\frac{1}{2} = -\frac{12}{10} + -\frac{5}{10} = -\frac{17}{10} = -1\frac{7}{10}$

4.) $\frac{15}{4} + -3\frac{1}{3}$

$\frac{15}{4} + \frac{-10}{3} = \frac{45}{12} + \frac{-40}{12} = \frac{5}{12}$

5.) -5.8 + 3.7

5.8 (Subtract since they're different signs)

-3.7

-2.1 (Should stay negative, because bigger one is negative)

6.) -2.5 + -3.2

2.5 (Add since they are same signs)

+3.2

-5.7 (Should stay negative because they were both negative)

7.) Your bank account balance is -20.85. You deposit $10.50. What is your new balance?

20.85 (Subtract since they're different signs)

-10.50

-$10.35 (Should stay negative since larger number was negative)

Section 2.3: Subtracting Rational Numbers Notes

POD: Solve.

1.) $\frac{7}{12} + \frac{1}{6} = \frac{3}{4}$

2.) $\frac{1}{2} + \frac{4}{5} = 1\frac{3}{10}$

Objective: Students will be able to subtract rational numbers.

Rules for subtracting fractions with different denominators:

1. Find their least common denominator.
2. Change the fractions according to their least common denominators.
3. Add or subtract the numerators.
4. Keep the common denominator.
5. Simplify.

Examples:

1.) $-\frac{1}{2} - \left(-\frac{5}{9}\right) = -\frac{1}{2} + \frac{5}{9}$

$-\frac{9}{18} + \frac{10}{18} = \frac{1}{18}$

2.) $-5 - \frac{5}{3}$

$\frac{-15}{3} + \frac{-5}{3} = \frac{-20}{3} = -6\frac{2}{3}$

3.) $-4\frac{1}{7} - \left(-\frac{6}{7}\right) = -4\frac{1}{7} + \frac{6}{7}$

$\frac{-29}{7} + \frac{6}{7} = \frac{-23}{7} = -3\frac{2}{7}$

4.) 12.8 - 21.9

21.9 (Subtract since they're different signs)

-12.8

-9.1 (Should stay negative, because bigger one is negative)

5.) -8.4 - 6.7

8.4 (Add since they're same signs)

+ 6.7

-15.1 (Should stay negative because they were both negative)

6.) Find the distance between -2.2 & 8.4

-2.2 - 8.4 = -2.2 + -8.4

2.2 (Add since they're same signs)

+ 8.4

10.6 (Distance can be positive)

7.) A cook has $2\frac{2}{3}$ cups of flour. A recipe calls for $2\frac{3}{4}$ cups of flour. Does the cook have enough flour?

$2\frac{3}{4} - 2\frac{2}{3} = 2\frac{9}{12} - 2\frac{8}{12} = \frac{1}{12}$

Not enough flour, still needs $\frac{1}{12}$ of a cup.

Section 2.4: Multiplying and Dividing Rational Numbers Notes

POD: Solve.

1.) $-\frac{4}{5}-\left(-\frac{2}{3}\right)=-\frac{2}{15}$

2.) $1\frac{1}{2}-2\frac{2}{3}=-1\frac{1}{6}$

Objective: Students will be able to multiply and divide rational numbers.

Steps for Multiplying Fractions:

1. Write each number as a fraction.
2. Multiply the numerators.
3. Multiply the denominators.
4. Simplify.

***YOU DO NOT NEED TO FIND A COMMON DENOMINATOR!

***YOU MAY SIMPLIFY THE FRACTIONS BEFORE MULTIPLYING!

Examples:

1.) $\frac{5}{8}\cdot\frac{2}{3}=\frac{10}{24}=\frac{5}{12}$ OR $\frac{5}{\cancel{8}_{4}}\cdot\frac{\cancel{2}^{1}}{3}=\frac{5}{12}$	2.) $-\frac{1}{4}\cdot-\frac{4}{3}=\frac{4}{12}=\frac{1}{3}$

Steps for Dividing by a Fraction:

1. Write each number as an improper fraction.
2. Rewrite the **second** fraction as a reciprocal (FLIP!)
3. Follow the rules for multiplying fractions.

**DIVIDING A FRACTION IS THE SAME AS MULTIPLYING ITS RECIPROCAL!

3.) $-\frac{3}{10}\div\frac{2}{5}$ $-\frac{3}{10}\cdot\frac{5}{2}=-\frac{15}{20}=-\frac{3}{4}$	4.) $-2\frac{4}{5}\div-7$ $\frac{-14}{5}\cdot\frac{-1}{7}=\frac{14}{35}=\frac{2}{5}$

5.) Rosa makes $2\frac{1}{2}$ cups of pudding. If she splits the pudding into cups of $\frac{1}{3}$ for each serving, how many servings can she get from the pudding?

$2\frac{1}{2}\div\frac{1}{3}=\frac{5}{2}\cdot\frac{3}{1}$

$\frac{15}{2}=7\frac{1}{2}$ servings