1.1 Fraction Vocabulary

Math is a foreign language. Would you go to Spanish class without learning the vocabulary for the day? It is important that you learn the terms that I will use so you will understand what I am teaching. The vocabulary list for Chapter 1 is on p. 84. Many math words are defined in the Glossary Appendix p. G-1. Basic math terms are defined at http://www.amathsdictionaryforkids.com/ More advanced terms are defined at http://www.mathwords.com/index_algebra.htm The space is an underline. http://illuminations.nctm.org/ActivityDetail.aspx?ID=18 Fraction Game

1. **Natural number**: 1, 2, 3, 4,…
2. **Whole number**: 0, 1, 2, 3, 4,…
3. **Rational number** (fraction): a number written as a ratio such as $\frac{2}{3}$ or $\frac{2}{3}$ of the class members are wearing red. 2 out of 3 class members are wearing red. I need to make 1½ times the cookie recipe for the class party. I spend $1.25 ($1 + ¼) for the candy. [natural numbers, whole numbers, fractions, terminal decimals, repeating decimals]
   
   Name each of these numbers: \{3, -5, $\sqrt{3}$, 0, $\frac{4}{5}$, 3.2, 2.33..., 3.14\}

4. **Prime number**: a number that can only be divided by 1 and itself (example: 11)
   0 and 1 are neither prime or composite.
5. **Composite number**: a number composed of factors (example: 24)
6. **Prime factors** (prime factor tree): a number is written as the multiples of prime numbers
   List the prime factors of 72. [Read NOTE p. 3.]

7. **Parts of a fraction**:
   a. **Denominator**: the number of parts (divisions) in the whole
   b. **Numerator**: the number of parts (divisions) under consideration

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   Shade 1/2, 2/3, 4/6, 4/8, and 1.
   Which are equivalent? How do you know they are equivalent?

   Explain the numerator and denominator in $\frac{4}{7}$
8. **Lowest Terms**: The numerator and denominator contain no common factors. p. 3-4
   Read Caution p. 4.
   Write in lowest terms: \( \frac{132}{231} \)
   a. Write numerator and denominator as prime factors.

   b. Eliminate any sets that equal 1.

   
   \[
   \frac{132}{231} = \frac{3 \cdot 4 \cdot 11}{3 \cdot 7 \cdot 11} = \frac{4 \cdot 11}{7} = \frac{4}{1} \cdot \frac{11}{1} = \frac{4}{1} \frac{11}{1} = \frac{4}{7} \quad \frac{12}{18} = \frac{2 \cdot 6}{3 \cdot 6} = \frac{2}{3} \quad \text{For simple fractions:} \quad \text{Divide by the greatest common factor.}
   \]

   \[
   \text{Shortcut:} \quad \frac{132}{231} = \frac{\cancel{3} \cdot 4 \cdot \cancel{11}}{\cancel{3} \cdot 7 \cdot \cancel{11}} = \frac{4}{7} \quad \frac{12}{18} = \frac{\cancel{2} \cdot 6}{\cancel{2} \cdot 3 \cdot 3} = \frac{2}{6} = \frac{2}{3}
   \]

9. **Greatest Common Factor**: The product of all factors common to both or the largest number that will divide into both the numerator and the denominator. This is needed when finding Lowest Terms of a fraction. Greatest Common Factor of 132 and 231 is 33.

10. **Proper fraction**: The numerator is less than the denominator. The fraction is less than the whole.

11. **Improper fraction**: The numerator is greater than the denominator. The fraction is greater than the whole.

   Draw \( \frac{2}{3} \) and \( \frac{4}{3} \) pizzas. Which is a proper fraction and which is an improper fraction?

12. **Mixed number**: A whole number plus a proper fraction. The fraction is greater than a whole.

   Draw \( 2 \frac{3}{5} \) candy bars.

   Convert \( \frac{12}{5} \) to a mixed number.

   Convert \( 2 \frac{3}{7} \) to an improper fraction.

   This is required in multiplication and division of fractions.
13. Two very important properties of numbers:
   a. A number times 1 is that number. \(2 \cdot 1 = 2\)
   b. A number divided by itself is 1. \(\frac{7}{7} = 1\)

14. **Least Common Denominator**: The least common multiple of all the denominators or the smallest number into which all the denominators will divide. This is needed when adding and subtracting fractions. p. 7

   First Method:
   a. Prime factor all denominators.
   b. Find all the factors in all lists. Use the largest power of a repeated factor.

   Find the least common denominator of \(\frac{1}{6}\) and \(\frac{3}{27}\).
   \[6 = 2 \cdot 3 \quad \text{and} \quad 27 = 3 \cdot 3 \cdot 3 = 3^3\]
   The least common denominator is \(2 \cdot 3^3 = 54\).

   Alternate Method:
   a. List all multiplies of each denominator.
   b. Find the smallest one that is in all lists.

   Find the least common denominator of \(\frac{1}{6}\) and \(\frac{3}{27}\).
   \[6: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60 \ldots\]
   \[27: 27, 54, 81\]
   54 is the smallest number in both lists.

15. **Reciprocal**: One of two numbers whose product is 1 or multiplicative inverse of a number (except zero). This is needed when dividing fraction. p. 5

   The reciprocal of \(\frac{1}{2}\) is \(2/1\). The reciprocal of \(1\frac{1}{2}\) is \(2/3\).

Read and study all terms, examples, and cautions.
Study the directions for each homework carefully.