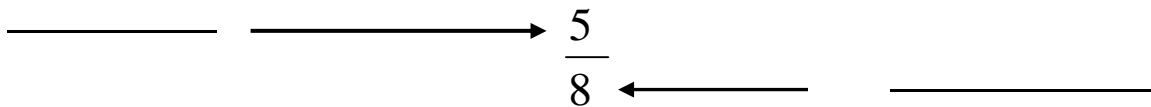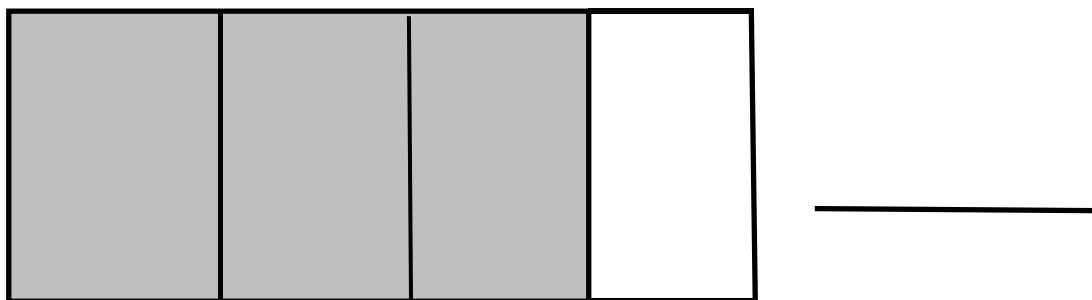## Introduction to Fractions and Mixed Numbers

Please read the Learn portion of this lesson while completing this handout.

o The parts of a fraction are (shown below):

$$\frac{5}{8}$$

o Fractions are used to indicate _____ of a whole.

o Use the picture below to write a fraction representing the shaded portion of the shape:

_____

o The fraction $\frac{2}{7}$ represents _____ of _____ equal parts.

o Whole numbers can be thought of as fractions with a denominator of

_____.

o Fraction notation represents the operation of _____.

o There are two rules to keep in mind when working with the value of zero in a fraction:

o For any nonzero value, b, $\frac{0}{b} = 0$. An example of this would be $\frac{0}{4} = 0$.

o For any value of a, $\frac{a}{0}$ = undefined. An example of this would be $\frac{6}{0}$ = undefined.

o Steps to multiply fractions:

1. Multiply the _____.

2. Multiply the _____.

o Multiply the following fraction: $\dfrac{2}{3} \cdot \dfrac{1}{5} =$ _____ = _____

o To find an equivalent fraction, you need to _____ the numerator and the denominator by the _____ nonzero whole number.

o Find an equivalent fraction for $\dfrac{2}{3} =$ _____ by multiplying both the numerator and the denominator by 5.

o There are two steps to reducing fractions to lowest terms:

1. Factor the _____ and _____ into prime factors.

2. Use the fact that $\dfrac{k}{k} = 1$ and divide out all of the _____ factors.

o What is the common factor that can be divided out of the fraction, $\dfrac{4}{12}$?

o What is $\dfrac{4}{12}$ in lowest terms?

o A mixed number is the sum of a _____ and a _____ fraction.

o To change a mixed number to an improper fraction, you need to:

1. Multiply the whole number by the _____ of the proper fraction.

2. Add the _____ of the proper fraction to this product.

3. Write this _____ over the denominator of the fraction.

o Change $3\dfrac{1}{2}$ to an improper fraction:

Multiply the whole number by the denominator: _____ · _____ = _____

o Add the numerator to the product from above: _____ + _____ = _____

o Write this sum over the denominator: _____

Introduction to Decimal Numbers

Please read the Learn portion of this lesson while completing this handout.

o Decimal notation uses a _____ _____ system and a

_____ point, with whole numbers written to the

_____ and fractions written to the _____ of the

decimal point.

o To read or write a decimal number:

   o _____ (or write) the whole number.

   o Read (or write) the word "_____" in place of the decimal point.

   o Read (or write) the _____ part as a whole number. Then name the fraction

      with the name of the last _____ on the right. Add "th" to the end of the

      fraction place value.

   o Remember that if there is not a whole number, you can put a _____ to the left

      of the decimal point.

o Write the following mixed number as a decimal number:

$$3\frac{4}{100} = \underline{\hspace{1cm}}.\underline{\hspace{1cm}}\ \underline{\hspace{1cm}}$$

   and it would be read as _____ AND _____ _____

o When writing seventeen and 5 thousandths in decimal notation you would have

_____ holders in the tenths and hundredths place values.

It would look like 17.005.

o When comparing decimals:

   o Moving _____ to _____, compare digits with the same

      _____ value.

o When one compared digit is larger, the _____ is larger.

o Compare the following values:

5.7<mark>8</mark>9   Notice that the numbers are lined up, for easier comparison.
5.7<mark>5</mark>4

When moving from left to right, the digits are the same until the _____ place

values. Those are going to be used to compare. Since the 8 is a larger value than 5,

_____ is a larger value.

o Rules for rounding decimals:

   o Look at the digit to the _____ of the place of desired accuracy.

   o If this digit is 5 or _____, make the digit in the desired place of accuracy one

     larger and replace all digits to the right with zeros.

   All digits to the left remain unchanged unless a 9 is made one larger. This effectively changes

   the 9 to 10 which means the next digit to the left must be increased by 1.

   o If this digit is _____ than 5, leave the digit in the desired place of accuracy as

     it is and replace all digits to the right with zeros.

   All digits to the left remain unchanged.

   o Zeros **to the right of the place of accuracy** and to the right of the decimal point must be

     _____. In this way the place of accuracy is clearly understood. If a rounded

     number has a 0 in the desired place of accuracy, then that 0 remains.

Round 13.2687 to the nearest hundredth.

   The digit in the hundredths is _____ .

   The digit in the place value to the right of the hundredths is _____ .

   Since that digit is greater than 5, the 6 in the hundredths place value changes to a 7.

   The rounded value is _____._____ _____

Decimals and Percents

Please read the Learn portion of this lesson while completing this handout.

- o The word percent comes from the Latin *per centum*, meaning per

   _____.

- o Percent means _____, or the ratio of a number to 100.

- o The symbol _____ is called the percent sign. This sign has the same

   meaning as the _____ $\frac{1}{100}$.

- o Changing fractions with denominators of 100 to percents:

- o Example: $\frac{25}{100} = 25\%$
   The _____ did not change.

- o Example: $\frac{3.8}{100} = 3.8\%$
   The _____ is not changed, the decimal point doesn't move if

   the _____ is 100.

- o To change a decimal to a percent:

1. Move the decimal point to places to the _____.

2. Write the _____sign.

   - ▪ Example: $0.56 = 56\%$

   - ▪ Example: $0.345 = 34.5\%$

   - ▪ Example: $0.02 = 2\%$

- o To change percents to a decimal number:

1. Move the decimal two places to the _____.

2. Delete the _____ sign.

- Example: $97\% = 0.97$

- Example: $68.5\% = 0.685$

- Example: $0.64\% = 0.0064$

Fractions and Percents

Please read the Learn portion of this lesson while completing this handout.

- o If a fraction has denominator _____, it can be changed to a percent by writing the _____ and adding the _____ sign.

- o If the denominator is a factor of _____ (2, 4, 5, 10, 20, 25, or 50), the fraction can be changed to an equivalent fraction with denominator of _____ and then changed to a percent.

- o When fractions do NOT have factors of 100 as denominators you will need to:

- o Change the fraction to decimal form by _____, either by long division or with a calculator (depending on instructions from instructor).

- o Move the decimal two places the _____ and write the _____ symbol.

    Example: $\dfrac{3}{4} = 4\overline{)3} = 0.75 = 75\%$

- o Helpful calculation tips:

- o The numerator goes _____ the division symbol and the denominator goes _____ of the division symbol.

- o If you are using a calculator, you will type the numerator _____, then the division symbol, and then the _____, followed by enter/equal.

- o To change a percent to a fraction or a mixed number:

- o Write the percent as a fraction with 100 as the _____ and drop the _____ symbol.

- o _____ the fraction, if possible.

Example: $80\% = \dfrac{80}{100} = \dfrac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 5}{2 \cdot 2 \cdot 5 \cdot 5} = \dfrac{4}{5}$

Solving Percent Problems by Using Proportions: P/100 = A/B

Please read the Learn portion of this lesson while completing this handout.

o The process of division with decimal numbers is similar to division with whole numbers.

   With whole numbers, we are concerned with the _____ but with decimal

   numbers, we are concerned with the _____ in the quotient.

o To divide decimal numbers:

   o Move the decimal point in the divisor to the _____ so that the divisor is a

      whole number.

   o Move the decimal point in the dividend the _____ number of places to the

      right.

   o Place the decimal point in the quotient directly _____ the new decimal point

      in the dividend.

   o Divide just as with _____ numbers. (0's may be added as needed to the

      dividend.)

o What to do if the remainder is not 0:

   o Decide first how many _____ _____ are to be in the

      quotient.

   o Divide until the _____ is one digit past the place of desired accuracy.

   o Using this last digit, round the _____ to the desired place of accuracy.

o Types of decimals:

   o Is eventually 0, the decimal number is said to be _____.

      Example: 3.5

   o If the remainder is not eventually 0, the decimal number is said to be _____.

Example: 9.888888888…….

o   To divide a decimal number by a power of 10:

  o   Count the number of _____'s in the power of 10.

  o   Move the decimal point to the _____ the number of places equal to the

      number of 0s.

o   Mental Math Quick Tips:

  o   Division by 10 moves the decimal point _____ place to the left.

  o   Division by 100 moves the decimal point _____ places to the left.

  o   Division by 1000 moves the decimal point _____ places to the left.

  o   And the pattern keeps going….

o   In order to estimate with division, _____ both the divisor and the dividend

    to the place of the last nonzero digit on the left and then _____ with these

    rounded values.