|  |  |
| --- | --- |
| ***Multiplying and Dividing Decimals***  **Handout KEY** | **Name: Date:** |

**Objective: Learn how to multiply and divide Decimals**

**PART A (segment 1&2)**

**Segment 1**: **Multiplying Decimals by Positive Powers of 10**

Powers of 10 are numbers like 10, 100, 1000, 10000 etc. Because our place value number system is based on tens, when we multiply by a power of 10, the decimals will simply move. Notice when you multiply by a positive power of 10, you are making the number larger. So the decimal will move to right.

Therefore: To Multiply a Decimal by a positive power of 10, simply move the decimal to the right the same number of places as the exponent on the 10.

**Example 1 Multiply  235.46**

**Example 2 Multiply  8714000**

**Example 3 Multiply  0.217**

**Segment 2: Multiplying Decimals**

To Multiply Decimals, first recognize that it is a little more complicated than simply lining up the decimals. Therefore to multiply decimals we will need to use a two-step process.

1. Multiply the numbers (Don’t worry about the decimal)
2. Now use estimation or count the total number of decimal places in both   
   factors to determine where to place the decimal in the answer. (For example  
   if the first number has 3 digits to the right of the decimal and the second   
   number has 4 digits to the right of the decimal, then the answer will have to  
   have 3+4 or 7 digits to the right of the decimal.)

**Example 5  30.36**

**Example 6  10.914**

**Example 7  0.297078**

***Now it is time for you to practice. Work on the following problems using the rules discussed above. The instructor will post the answers on the board for you to check. Break up into pairs and discuss wrong answers with your partner.***

**Practice 1** **Multiply  387560**

**Practice 2** **Multiply  52.891**

**Practice 3** **Multiply  9264.1**

**Practice 4** **Multiply  5.68**

**Practice 5** **Multiply  6.058**

**Practice 6** **Multiply  1.692222**

**PART B (segment 3&4)**

**Segment 3: Dividing Decimals by Positive Powers of 10**

Recall that positive powers of ten are numbers like 10, 100, 1000 etc. We saw that when we multiply by powers of ten we simply have to move the decimal to the right the same number of places as the exponent on the ten. Well dividing is no different. When we divide by a positive power of ten, we are making the number smaller, so we will move the decimal to the left.

Note that division problems can be written with the division symbol or as a fraction.

**Example 8 Divide  0.078684**

**Example 9 Divide  *(Round answer to the nearest cent)* $1.24**

**Example 10 Divide  1.34972**

**Segment 4: Dividing Decimals**

Dividing Decimals can be difficult. Recall that we want our divisor (the number we are dividing by) to be a whole number. Hence use the following steps.

1. Convert the divisor into a whole number by moving the decimal to the right as many places as needed until it is a whole number. (Note: If the divisor is already a whole number, then skip steps 1 and 2 and go right to setting up the long division.)
2. Move the decimal to the right the same number of places as in step 1 for the number being divided. Now rewrite the long-division and line up the place value.
3. Perform the long division. Add zeros as needed to the end of the number being divided until the division process ends or we see a repeating pattern. Note: Do Not move the decimal point from its position in step 3. It is in the correct place.

**Example 11 Divide  3.684**

**Example 12 Divide  (*Round to the hundredths place)* 0.57**

**Example 13 Divide  **

***Now it is time for you to practice again. Work on the following problems using the rules discussed above. The instructor will post the answers on the board for you to check. Break up into pairs and discuss wrong answers with your partner.***

**Practice 7 Divide  0.92763**

**Practice 8 Divide  0.0065321**

**Practice 9 Divide  0.2783**

**Practice 10 Divide  *(Round your answer to the thousandths place)* 0.065**

**Practice 11 Divide  **

**Practice 12 Divide  5.61**

**Quiz:** Let’s check to see how much you have learned. Take the quiz. Then check your answers.

When you are done, answer the following self-reflection questions.

**SELF-REFLECTION**

-If you were going to make a mistake when you multiply or divide a decimal, what would be the mistake?   
Why do you think you make that mistake more often?

-What steps are you going to take so that you make fewer mistakes when you multiply or divide decimals?