LESSON 5 - DECIMALS

INTRODUCTION

Now that we know something about whole numbers and fractions, we will begin working with types of numbers that are extensions of whole numbers and related to fractions. These numbers are called *decimals* or *decimal numbers*.

The table below shows the specific objectives that are the achievement goal for this lesson. Read through them carefully now to gain initial exposure to the terms and concept names for the lesson. Refer back to the list at the end of the lesson to see if you can perform each objective.

Lesson Objective	Related Examples
Identify *decimal place values*.	1, YT4c
Write *decimal numbers* in words.	2, YT4a
Round *decimals numbers* to a given place value.	3, YT4b
Convert *decimals* to fractions.	5, YT6
Convert fractions to *decimals*.	7, YT8
Simplify *decimal* expressions with the aid of a calculator	9, YT10
Solve problems involving *money decimals*.	11, 12, YT13
Order decimals & fractions from least to greatest.	14, YT16
Solve applications involving *decimals*.	15, YT17

KEY TERMS

The key terms listed below will help you keep track of important mathematical words and phrases that are part of this lesson. Look for these words and circle or highlight them along with their definition or explanation as you work through the MiniLesson.

- Decimals/Decimal Numbers
- Decimal Point
- Decimal Place Values
- Rounding Decimals
- Mathematical Operations
- Order of Operations (PEMDAS)
- Money Decimals
- Ordering Decimals

LESSON CHECKLIST

Use this page to track required components for your class and your progress on each one.

Component	Required? Y or N	Comments	Due	Score
Mini-Lesson				
Online Homework				
Online Quiz				
Online Test				
Practice Problems				
Lesson Assessment				

MINILESSON

DECIMALS, PLACE VALUE, and ROUNDING

*Decimal*s contain numbers to the right of the *decimal point*. The place value chart below identifies the first few decimal places. Use this chart to help you with the examples below.

BILLIONS				MILLIONS				THOUSANDS				ONES				DECIMALS			
100	10	1	,	100	10	1	,	100	10	1	,	100	10	1	.	tenths	hundredths	thousandths	ten-thousandths

Example 1: What place does the DIGIT 4 occupy in each number?

a. 324, 231.17

b. 256.134

c. 0.04

d. 1.4671

Example 2: Write in words the numbers listed in Example 1.

a. 324, 231.17 In Words: _____

b. 256.134 In Words: _____

c. 0.04 In Words: _____

d. 1.4671 In Words: _____

As in lesson 1, *rounding* is used to approximate numbers to a particular place value. The process of rounding involves choosing a number (to the indicated place value) that is closest to the number you have. *Decimal rounding* is similar to whole number rounding, however, the decimal place values have different names and locations.

Example 3: Round each of the following numbers to the indicated place value.

a. 42.3456 to the nearest tenths place

b. 42.3999 to the nearest hundredths place

c. 42.3456 to the nearest thousandths place

YOU TRY

4a. Write the number 12.619 using words.

_____

4b. Round 12.699 to the nearest hundredth. _____

4c. What place does the digit 6 occupy in the number 12.619? _____

CHANGING FROM DECIMALS TO FRACTIONS

Decimals are really fractions in disguise, as you will see in the examples below.

Example 5: Change each of the following to a simplified fraction or mixed number.

a. 0.6 b. 1.15 c. 0.0564

YOU TRY

6. Change each of the following to a simplified fraction or mixed number.

a. 5.375 b. 0.025

Your calculator can help you convert decimals to fractions. Look for Frac<->Dec somewhere on the calculator. Refer to your calculator manual for steps.

CHANGING FROM FRACTIONS TO DECIMALS

Fractions can easily be converted to decimals using the mathematical operation of division.

Example 7: Change each of the following to a decimal. Round to the nearest hundredth as appropriate.

a. $\frac{3}{4}$

b. $\frac{52}{10}$

c. $\frac{1}{3}$

d. $10\frac{3}{7}$

YOU TRY

8. Change each of the following to a decimal. Round to the thousandths place as appropriate.

a. $\frac{531}{25}$

b. $\frac{41}{9}$

c. $3\frac{6}{11}$

OPERATIONS WITH DECIMALS – CALCULATOR ASSISTED

When performing the mathematical operations of addition, subtraction, multiplication, and division using decimals, our calculator is a great support tool. Once the given numbers are combined, rounding often comes into play when presenting the final result.

Example 9: Use your calculator to compute each of the following. Round as indicated.

a. Multiply $4.32 \cdot 3.17$ then round the result to the nearest tenth.

b. Divide $523.14 \div 23.56$ then round the result to the nearest thousandth.

c. Multiply $(0.1)^2$. Write your result first in decimal form. Then, convert to a simplified fraction.

d. Combine the numbers below. Round your final result to the nearest whole number.

$3.721 + 4.35 \cdot 21.72 - 0.03$

YOU TRY

10. Use your calculator to combine the numbers below. Round your final result to the nearest hundredth. When computing, try to enter the entire expression all at once.

$(6.41)^2 - 5.883 \div 2.17$

DOLLARS AND CENTS – WORKING WITH MONEY

Pennies = Cents = 2 decimal places = Hundredths place

Dollars = ones place

Example 11: Write each of the following word phrases as a decimal

a. Twelve dollars and seventy-five cents

b. Thirty-two cents

c. Five cents

d. One hundred dollars and seven cents

Example 12: Round each of the following monetary amounts as indicated:

a. $127.56 to the nearest dime

b. $127.56 to the nearest dollar

c. $127.56 to the nearest ten dollars

d. $127.56 to the nearest hundred dollars

YOU TRY

13a. Write as a decimal: Twenty dollars and five cents _____

13b. Round $311.58 to the nearest dollar. _____

ORDERING DECIMALS & FRACTIONS

When given numbers in decimal and/or fraction form, can you order them correctly from smallest to largest? The following examples will explain ways to do that.

Example 14: Order each of the following sets of numbers from smallest to largest.

a. 0.042, 0.420, 0.402

b. 1.73, $1\frac{11}{15}$, 1.7

APPLICATIONS WITH DECIMALS

Example 15: In preparation for mailing a package, you place the item on your digital scale and obtain the following readings: 6.51 ounces, 6.52 ounces, and 6.60 ounces. What is the average of these weights? Round to the nearest hundredth of an ounce.

GIVEN:

GOAL:

MATH WORK:

CHECK:

FINAL ANSWER AS A COMPLETE SENTENCE:

YOU TRY

16. Order the following set of numbers from smallest to largest. Show work or explain your reasoning.

$$3.555,\quad 3.055,\quad 3.55,\quad 3\frac{3}{5},\quad 3.5,\quad 3.05$$

17. Rally went to Target with $40 in his wallet. He bought items that totaled $1.45, $2.15, $7.34, and $14.22. If the tax comes to $2.26, how much of his $40 would he have left over? Round to the nearest cent.

GIVEN:

GOAL:

MATH WORK:

CHECK:

FINAL ANSWER AS A COMPLETE SENTENCE: