# Lesson 05: Decimals

## Decimals: Introduction, Place Value, and Rounding

**Place Value:**

| Hundreds | Tens | Ones | AND | Tenths | Hundredths | Thousandths | Ten thousandths | Hundred thousandths |
|---|---|---|---|---|---|---|---|---|
| 7 | 4 | 9 | . | 2 | 1 | 8 | 9 | 6 |

Seven hundred forty-nine AND twenty-one thousand, eight hundred ninety-six hundred thousandths

**Reading a decimal:** 749.21896

1. Read the digits to the left of the decimal point as a whole number. *Seven hundred forty-nine*
2. Red the decimal point as *AND*
3. Read the digits to the right of the decimal point as a whole number followed by the place value of the rightmost digit. *twenty-one thousand, eight hundred ninety-six hundred thousandths*

TRY: Write the following in words.

3.025

12.009

**Vocabulary**

| Decimal Fraction | A fraction whose denominator is a power of 10 |
|---|---|

| Hundreds | Tens | Ones | AND | Tenths | Hundredths | Thousandths | Ten thousandths | Hundred thousandths |
|---|---|---|---|---|---|---|---|---|
| $10^2$ | $10^1$ | $10^0$ | . | $\frac{1}{10^1}$ | $\frac{1}{10^2}$ | $\frac{1}{10^3}$ | $\frac{1}{10^4}$ | $\frac{1}{10^5}$ |
| 100 | 10 | 1 | | .1 | .01 | .001 | .0001 | .00001 |
| 7 | 4 | 9 | . | 2 | 1 | 8 | 9 | 6 |

Examples:

13.07 is read thirteen and seven hundredths. As a mixed number it is: $13\frac{7}{100}$

245.125 is read two hundred forty-five and one hundred twenty-five thousands.

As a mixed number it is: $245\frac{125}{1000}$ which simplifies to: $245\frac{1}{8}$

TRY: Complete the following table (do not simplify).

| Mixed Number | Decimal | Mixed Number | Decimal |
|---|---|---|---|
| | 35.4 | $3\frac{23}{10000}$ | |
| $7\frac{3}{10}$ | | | 12.009 |
| | 3.025 | $13\frac{7}{100}$ | |

**Which is larger?**

To compare two decimals, line up the decimal points. If one has fewer digits to the right of the decimal point than the other, add zeros as needed. Compare the two values.

Example:

.228 > .215 .3266 ? .327 (change to .3270 and compare)

.3266 < .3270

TRY: Arrange the following in order from smallest to largest.

.61 .061 $\frac{6}{100}$ .0059 $\frac{6}{10}$

**Process of Rounding:**

| | |
|---|---|
| Round .52634 to the nearest .001<br><br>Rounded answer: .526 | 3. Look at the digit to the right of the .001's place. (Look at the 3.)<br>4. Since the digit is less than 5, discard that digit and all others to the right. (i.e., discard the 3 and the 4) |

| | |
|---|---|
| Round 17.648 to the nearest .01.<br><br>Rounded answer: 17.65 | 1. Look at the digit to the right of the .01's place. (Look at the 8.)<br>2. Since the digit is 5 or greater, increase the value of the .01's place by one and discard all other digits to the right. (i.e., increase the 4 to a 5 and discard the 8) |

TRY:

| Round each to the … | Nearest tenths | Nearest hundredths | Nearest thousandths |
|---|---|---|---|
| 8.3238 | | | |
| 14.9794 | | | |
| 5.0723 | | | |

Careful! If asked to round to a specific place, be sure to have a digit remain in that place – even if the digit is 0.