

# Guided Lesson Notes

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Error and Significant Figures

**Directions:** Complete this study guide as you move through the lesson. By taking notes, you are more likely to remember what you are learning. The completed study guide can be used for practice activities and to prepare for quizzes and exams. Be sure to save each study guide so you can access it when you need it.

### Essential Vocabulary

As you encounter these scientific terms in the lesson, enter the meaning and an example (or two) for each. You can even draw a picture. If there are other unfamiliar words you find, enter them in the blank spaces provided.

<i>accuracy</i>	<i>precision</i>
<i>significant figures</i>	<i>experimental error</i>
<i>parallax</i>	<i>theoretical value</i>

<i>experimental value</i>	

## Introduction

### 1. Fill in the blanks below about experimental error.

Error in the \_\_\_\_\_ setting needs to be kept to a \_\_\_\_\_ so that the \_\_\_\_\_ can be trusted and \_\_\_\_\_. In fact, much of what you will do in this course is \_\_\_\_\_ to find out relationships between \_\_\_\_\_. If your \_\_\_\_\_ are not \_\_\_\_\_ and \_\_\_\_\_, you may not \_\_\_\_\_ the relationships. With accurate and precise \_\_\_\_\_, you can speak to those \_\_\_\_\_ with confidence.

### 2. What are three examples of experimental error?


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### Accuracy and Precision

<b>1. Accuracy is defined as the _____ of a measurement.</b>
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**What are some practical examples of accuracy in measurement?**

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**2. List and define three types of accuracy errors:**


<b>3. Precision is defined as the _____ of a measurement.</b>
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**What are some practical examples of precision in measurement?**

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#### 4. Fill in the blanks about measuring precision.

\_\_\_\_\_ are used in measurement to numerically indicate precision.

#### Precision in Measurement

##### 1. When looking at a ruler, what determines its level of precision?

##### 2. Fill in the blanks below about using digits to make measurements.

When measuring, provide the number of digits you can tell exactly on the device

\_\_\_\_\_.

Why is a measurement of 1.033 cm more precise than 1.03 cm?

#### Significant Figures

List the key rules for determining significant figures and give an example of each rule.

Rule	Example
Significant figures in a measurement include the known digits plus a final estimated digit	

<b>Counting significant figures</b>	
<b>Adding/subtracting with significant figures</b>	
<b>Multiplying/dividing with significant figures</b>	
<b>Exact numbers</b>	
<b>Scientific notation</b>	
<b>When to apply significant figures</b>	

### **Percent Error**

1. Write the formula for calculating percent error.

2. When determining percent error, what is used as the reference value and placed in the calculation's denominator?

3. Why is absolute value used in calculating percent error?

### **Percent Error Practice**

1. If the experimental value is 27.56 cm, and the theoretical value is 29.52 cm, what is the percent error? Include the work to determine this answer.

**Percent error:**

2. If the experimental value is 14.58 seconds, and the theoretical value is 13.25 seconds, what is the percent error? Include the work to determine this answer.

**Percent error:**