

Guided Lesson Notes

Name: _____ Date: _____

Simple Harmonic Motion

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>simple harmonic motion</i>	<i>mass-spring system</i>
<i>Hooke's law</i>	<i>simple pendulum</i>
<i>oscillation</i>	<i>restoring force</i>

<i>period</i>	

Introducing SHM

1. Fill in the blanks below about simple harmonic motion.

_____ motion is defined as any _____ motion that happens in equal _____ of time. There are many types of periodic motion, but one type that we will discuss is called _____ (SHM). Simple harmonic motion is specifically any type of periodic motion that moves _____ and _____ across an _____ in which a _____ is _____ to the _____ from that _____ point.

2. In the example of the block oscillating on a horizontal spring, what provides the restoring force that keeps the block in motion?

3. Fill in the blank about the force involved in simple harmonic motion.

It is directly _____ to the _____ from the equilibrium point.

Force vs. Displacement

1. Use the table to define the terms.

Simple Harmonic Motion	Periodic (in the context of simple harmonic motion)	Restoring Force

2. Identify some examples of oscillations caused by simple harmonic motion.

3. What is unique about the equilibrium position in a mass-spring system?

4. Fill in the blanks:

According to Hooke's law, as the _____ gets larger, the _____ gets larger as well but in the opposite direction.

5. Hooke's law is shown. $\vec{F} = -k\vec{x}$

Define each of the following components below.

$\vec{F} =$	
$-$ (minus sign) =	
$k =$	
$\vec{x} =$	

Hooke's Law

1. Define the spring constant in your own words.

2. What are the units for the spring constant? How does Hooke's law lead to these units?

Hooke's Law Example Problems

Select one of the problems listed and complete the table with the appropriate information. Choose from: 4.92 N mass, 2.49 N mass, or 1.9 kg mass.

Problem:	
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Picture	Given/Find	Equation	Solution

The Pendulum

1. Sketch the drawing of the pendulum from the page. Identify all the forces acting on the mass at the end of the string and label the one that acts as the restoring force.

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2. Is a pendulum an example of simple harmonic motion (SHM)? Use the three requirements for SHM to explain.

