Study Guide for Modeling Waves through Various Mediums--

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

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour: \_\_\_\_\_\_\_\_\_

I have completed the study guide along with studying for \_\_\_\_\_\_\_\_ minutes/hours for this test.

I am aware that my son /daughter has a test on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and that they have studied either independently or with me.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Parent Signature)

# Use your Stemscopedia to complete this portion of the study guide

Information from this part can be used as True / False or Multiple Choice

* Waves are created when a source (force) generates a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Waves are moving ­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Some waves need a medium to travel, while others do not. Waves such as water must transfer energy through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, they are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Waves such as sunlight can transfer energy through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and do not need a medium, they are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* The type of matter that a wave travels through determines the speed of the wave. The waves traveling through \_\_\_\_\_\_\_\_\_\_\_\_\_\_ move the slowest, waves traveling through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ move the fastest, leaving waves traveling through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the middle.
* Characteristics of how a wave behaves allows the wave to be categorize mechanical waves as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (up and down movement) or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (horizontal compression)
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ travel in a direction perpendicular to the wave direction. These types of waves cannot propagate in a fluid (gas or liquid) because there is no mechanism for driving the motion---which means this type of wave are only transmitted through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Characteristics of transverse waves include:
  + \_\_\_\_C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_W\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_F\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ travel in the same direction ( \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) as the wave energy, another name for this type of wave is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ wave. Fluids (\_\_\_\_\_\_\_\_\_\_) and (\_\_\_\_\_\_\_\_\_\_\_) transmits only longitudinal wave, such as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Characteristics of longitudinal waves include:
  + \_\_\_\_C\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_R\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_T\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* How sound waves are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (bounce back), are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (stop within the medium), or are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_( pass through) depends on the mediums they encounter.
  + Smooth surfaces reflect sound more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ while rough surfaces \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sound (reflect in many directions)
  + Porous or soft materials \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ more sound than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ surfaces
  + Thin materials or materials allow more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than thick or nonmetal mediums
  + Denser materials \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sound better than less dense materials
  + \_\_\_\_\_\_\_\_\_\_\_\_\_ transmit sound better than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ transmit sound better than \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Law of reflection states that the angle of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ wave equals the angle of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* When sound reflects off distant canyon walls, sometimes you can hear an \_\_\_\_\_\_\_\_\_\_. Sound travels very fast but to create a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_, the distance must be at least 75 meters.
  + Animals such as \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ use their sensitive hearing to detect and locate echoes from objects by emitting a high pitch sound that bounces back to their ears---this is called animal sonar called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Too much reflected sound can be a nuisance ---acoustical engineers will often use \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, eggcrate foam tiles, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to absorb sound in movie theaters, concert halls, and office area
* Even though sound waves travel as longitudinal waves---they are sometimes drawn as transverse waves---the area of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ represented by crest and areas of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by troughs. With this type of graphic, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (loudness) and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (pitch) of the sound are easier to understand

# Vocabulary Definitions

Be familiar (know the definition) of the following terms: These can be used on the test as either matching or fill in the blank style questions

* Absorption
* Diffraction
* Longitudinal Waves
* Mechanical Waves
* Medium
* Reflection
* Refractive Index
* Sound Waves
* Transmitted
* Transversal Wave
* Waves

# Short Answer or Multiple Choice Style Questions

* Explain why you would not hear sound in space
* Explain how a sound waves is created and how they travel
* Be able to give examples of how sound waves are absorbed, reflected, or transmitted (think about Explore Activities)

# Math Connections---Calculations

* Calculation of Frequency
  + f = 1/time (period) measured in Hertz
* Velocity of Wave (wave speed)
  + V = wavelength / frequency measured in meters/seconds
* Amplitude
* Wavelength these types of measurements can be taken from a graph
* Period