

 **POWER BASICS**  **PLUS**

# Physics

Workbook

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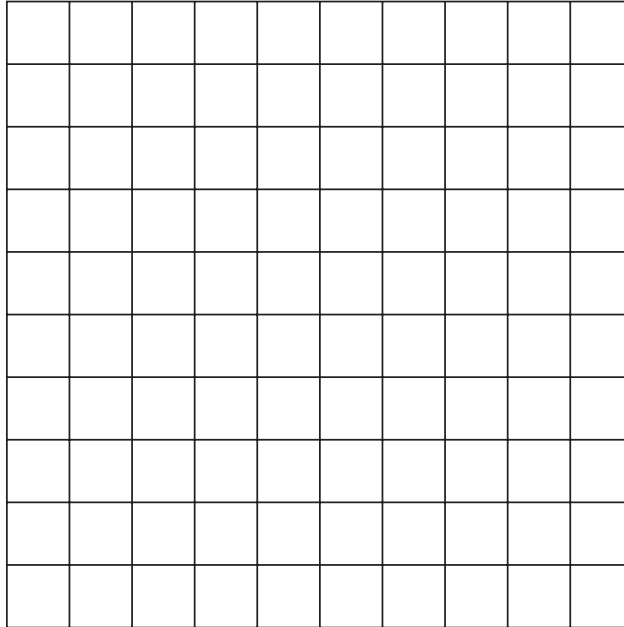
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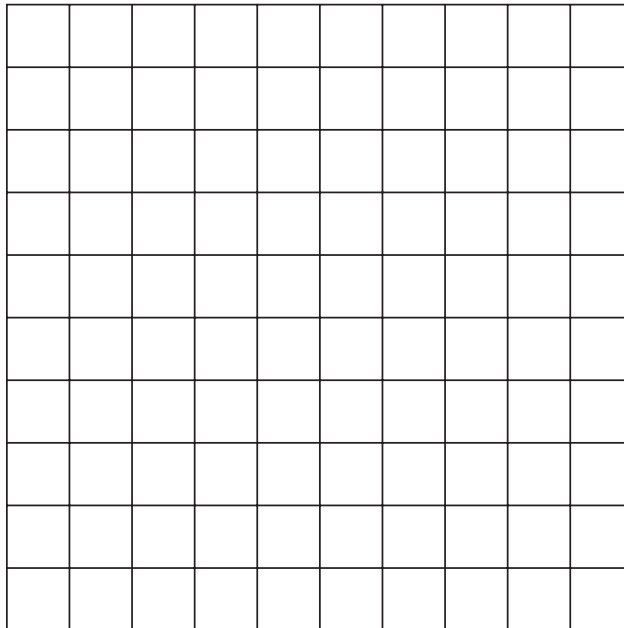
**UNIT 3 • ACTIVITY 48****Descriptions of Waves**

Read the two descriptions of waves below. Use the information to draw each wave on the grid that follows. Each square on the grid is 1 unit by 1 unit.

1. The wavelength is 4 units.  
The amplitude is 2 units.



2. The wavelength is 5 units.  
The amplitude is 1 unit.



**UNIT 3 • ACTIVITY 49****Frequency and Period**

Circle the answer that best completes each sentence below.

1. Suppose that a flag flutters 5 times per second on a windy day. The period of each individual flutter is \_\_\_\_\_.
  - a. 5 seconds
  - b. 0.5 seconds
  - c. 0.2 seconds
  - d. 0.02 seconds
  
2. A pendulum swings back and forth once every 2 seconds. The frequency of each complete swing of the pendulum is \_\_\_\_\_.
  - a. 0.5 Hz
  - b. 1 Hz
  - c. 2 Hz
  - d. 5 Hz
  
3. The period of the swing of the same pendulum is \_\_\_\_\_.
  - a. 0.5 seconds
  - b. 1 second
  - c. 2 seconds
  - d. 5 seconds
  
4. As the frequency of a wave increases, the period of the wave \_\_\_\_\_.
  - a. decreases
  - b. remains the same
  - c. increases
  - d. approaches infinity

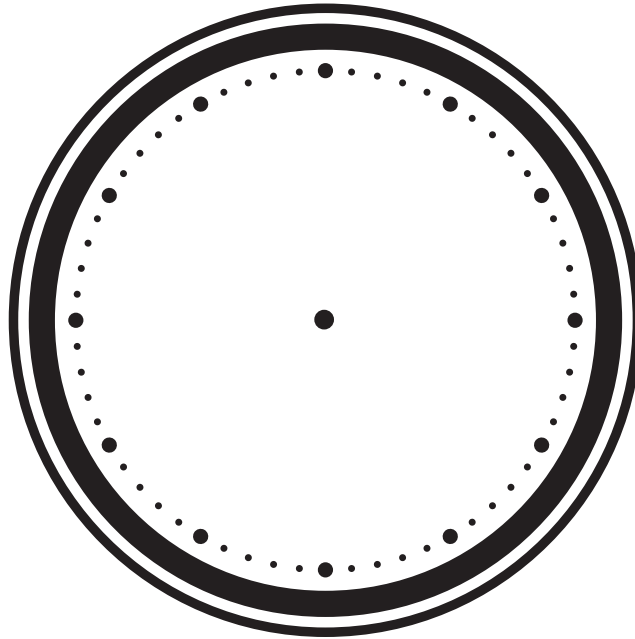


**UNIT 3 • ACTIVITY 50****Measuring in Hertz**

In your student text, you learned that the most common unit used to measure frequency is the hertz. Hertz is the number of waves per second.

In this activity, you will measure the frequency of the hands of a clock in hertz.

Draw in the numbers (1 to 12) on the clock below. Then draw in the second hand, the minute hand, and the hour hand.



Now think about how often each hand moves around the clock, and answer the following three questions. Be sure to write your answer in hertz!

1. What is the frequency (in hertz) of the second hand? (*Hint:* It takes the second hand 60 seconds to move all the way around the clock.)

\_\_\_\_\_

2. What is the frequency (in hertz) of the minute hand?

\_\_\_\_\_

3. What is the frequency (in hertz) of the hour hand?

\_\_\_\_\_

**UNIT 3 • ACTIVITY 52****Motion of Waves**

Circle the answer that best completes each sentence below.

1. The frequency of a wave is \_\_\_\_\_.
  - a. how quickly the wave moves from one place to another
  - b. the density of the medium through which the wave travels
  - c. how quickly the wave oscillates
  - d. the direction the wave is traveling
  
2. One way to increase the speed of a wave traveling along a rope is to \_\_\_\_\_.
  - a. shake the rope slower
  - b. shake the rope faster
  - c. stretch the rope tighter
  - d. None of the above. There is no way to increase the speed of a wave.
  
3. When the crests of two different waves overlap and create an even bigger crest, it is called \_\_\_\_\_.
  - a. destructive interference
  - b. constructive interference
  - c. diffraction
  - d. a longitudinal wave
  
4. Suppose a transverse wave is traveling through a medium left to right. The particles of the medium will move \_\_\_\_\_.
  - a. from left to right only
  - b. both left and right
  - c. both up and down
  - d. up, down, left, and right

**UNIT 3 • ACTIVITY 51****Transverse Waves and Longitudinal Waves**

Remember that a transverse wave is the kind of wave in which the medium moves perpendicular to the direction the wave travels. Imagine that several of your friends or family members are standing in a line in front of you. It is your job to instruct them how to create one big transverse wave. The medium is the line of people. The wave should travel all the way from one end of the line to the other.

1. What would you say to your friends or family members to make them understand how to move to produce the transverse wave? Write your instructions on the lines below.

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2. Next you decide to ask the group to produce a longitudinal wave. Remember that a longitudinal wave is the kind of wave in which the vibration of the medium is in the same direction as the wave is traveling. What would you say to the line of people to explain how to create a longitudinal wave? Write your instructions on the lines below.

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3. Which wave do you think would be the most difficult for the group to create? Why?

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