

15.3 Behavior of Waves
Honors Integrated Science
Problem Set

Name _____ Per. _____ Date _____

Directions: Use the online ck12 reading, which is posted on the class website, to help you answer the following questions.

True/False: Write (T) for true and (F) for false on the line provided.

- _____ 1. Reflection occurs only with sound waves.
- _____ 2. All reflected waves appear to be standing still.
- _____ 3. The angle of incidence is always greater than the angle of reflection.
- _____ 4. Diffraction is more pronounced with sound waves than light waves.
- _____ 5. Wave interference occurs whenever waves enter a new medium.
- _____ 6. Wave interference occurs only when a wave is reflected.
- _____ 7. Light waves refract when they pass from air to water.
- _____ 8. Interference occurs only when the crests of one wave overlap with the troughs of another wave.
- _____ 9. A standing wave occurs when a wave is reflected straight back from an obstacle.
- _____ 10. Wave interference always changes the speed of a wave.

Multiple-Choice: Write the letter of the correct choice on the line provided.

- 1. _____ Ways that waves may interact with matter include
 - a. diffraction.
 - b. destructive interference.
 - c. constructive interference.
 - d. all of the above
- 2. _____ Reflected waves differ from the original waves before they were reflected in their
 - a. speed.
 - b. direction.
 - c. frequency.
 - d. wavelength.

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3. _____ Refraction occurs because waves
 - a. cannot travel through an obstacle such as a wall.
 - b. travel at different speeds in different media.
 - c. interfere with their reflected waves.
 - d. none of the above

4. _____ If the length of an obstacle is greater than the wavelength of a wave, you would expect to see
 - a. no diffraction.
 - b. very little diffraction.
 - c. a lot of diffraction.
 - d. wave interference.

5. _____ A standing wave is a wave that
 - a. is not moving.
 - b. has an upright direction.
 - c. is taller than other waves.
 - d. appears to be standing still.

6. _____ A standing wave occurs because of a combination of
 - a. incidence and reflection.
 - b. refraction and diffraction.
 - c. refraction and interference.
 - d. constructive and destructive interference.

7. _____ Which statement about destructive interference is true?
 - a. It occurs when waves pass through each other.
 - b. It results in a wave with a higher frequency.
 - c. It occurs when waves interact with matter.
 - d. It always produces a standing wave.

Matching: Match each definition with the correct term.

Terms: a. diffraction b. wave interaction c. reflection d. constructive interference
e. refraction f. destructive interference g. wave interference

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Definitions

- _____ 1. change in direction of waves as they enter a new medium at an angle
- _____ 2. bouncing back of waves from a barrier
- _____ 3. any interaction of waves with other waves
- _____ 4. situation in which crests of one wave overlap crests of another wave
- _____ 5. any interaction of waves with matter
- _____ 6. spreading out of waves as they pass around a barrier
- _____ 7. situation in which crests of one wave overlap troughs of another

Fill-In: Fill in the blank with the appropriate term on the line provided. Words may be used more than one time.

Terms: constructive, reflect, wavelength, incidence, refractions, reflection, diffraction

- 1. An echo is an example of wave _____.
- 2. We can see objects because they _____ waves of light.
- 3. You can hear sounds around the corner of a building because of wave _____.
- 4. How much a wave is diffracted depends on the length of the obstacle and the _____ of the wave.
- 5. _____ interference increases wave amplitude.
- 6. A straight straw in a glass of water appears to be bent because of wave _____.
- 7. The angle with which waves strike a barrier is called the angle of _____.