

Name _____ Date _____ Class Period _____

Waves: Sound & Light Unit Study Guide

1. Waves transfer **Energy** .
2. Which of the following types of waves requires a medium: microwave, visible light, sound waves or x-rays? **Sound waves**
3. If a wave is traveling at a certain speed and its frequency is doubled, what happens to the wavelength of that wave? It is **cut in half**
4. A wave can make a leaf bob up and down on the water, but it cannot move the leaf toward the shore. This is because waves only transfer **Energy**.
5. Which of these waves do NOT require a medium? Sound, ocean, **radio**, or seismic.
6. Which of the following is NOT a property of a wave? Amplitude, frequency, wavelength, **refraction**.
7. An echo is the result of a **reflected** sound wave.
8. A section of a longitudinal wave where the particles are crowded together is called a **compression**.
9. When the crests of one wave overlap the crests of another wave or waves, this occurs: **constructive interference**.
10. Part of a longitudinal wave where the particles are spread apart is called is called a **rarefaction**.
11. Which of the following waves is an example of a mechanical wave: light, x-ray, radio or **ocean** wave?
12. What unit is used to describe the frequency of a wave? **Hertz**
13. Why do sound waves travel around corners better than light waves? Sound waves **bend**.

14. A substance through which a wave can travel is a **medium**.
15. The amplitude of a sound's waves determines the sound's **loudness**.
16. The motion of either the listener or the source of a sound causes the **Doppler Effect**.
17. The frequency of a sound wave determines the **pitch** of the sound.
18. The medium through which sound waves travel affects the **speed** of the sound.
19. Which person will experience what happens to sounds due to the Doppler effect? Two friends riding bicycles side-by-side and talking; a father pushing a laughing toddler on a swing; a boy sitting and watching television; a girl running and listening to her radio through earphones.
A father pushing a laughing toddler on a swing
20. Which sound has the highest pitch? 156 Hz (hertz); **258 Hz**; 14 dB (decibels); 563 dB
21. Electromagnetic waves are produced by the vibration of an **electric** field and a **magnetic** field together.
22. The electromagnetic spectrum is divided into regions by **wavelengths**.
23. What wave interaction occurs when waves combine and the resulting wave has a greater amplitude than the individual waves had? **Constructive interference**.
24. What wave interaction occurs when waves combine and the resulting wave has a smaller amplitude than the individual waves had? **Destructive interference**.
25. Whether an object is transparent, translucent, or opaque is determined by its ability to **transmit** light.
26. What are the primary colors of light?
The primary colors of light are red, green and blue.
27. What are the primary colors of pigments?
The primary colors of pigments are cyan, magenta and yellow.
28. How does the result of mixing the primary colors of light compare to the result of mixing the primary colors of pigment? **Mixing the primary colors produces the color white ; mixing the primary colors of pigments produce the color black.**

29. When white light is refracted, the amount that the light bends depends on what? The light's **wavelength**.

30. What kind of waves are used in radar for detecting the speed of a car? **Microwaves**

31. What kind of waves can be used to treat some cancerous tumors? **Gamma Rays**

32. When you increase the frequency of a sound wave...

- a. the period will also increase.
- b. the period will decrease .
- c. **pitch will decrease.**
- d. loudness will increase.

33. Mechanical waves can **NOT** transport...

- a. energy
- b. material
- c. matter
- d. **answers b and c are correct**

34. Compared to the speed of light, sound travels...

- a. **faster.**
- b. at about the same speed.
- c. slower.

Answer questions 35 - 37 based on the wave-form below. The wave was produced when a student sings a tune for 0.03 seconds. Assume the speed of sound in air is 320 m/s.

35. How many full waves are there?

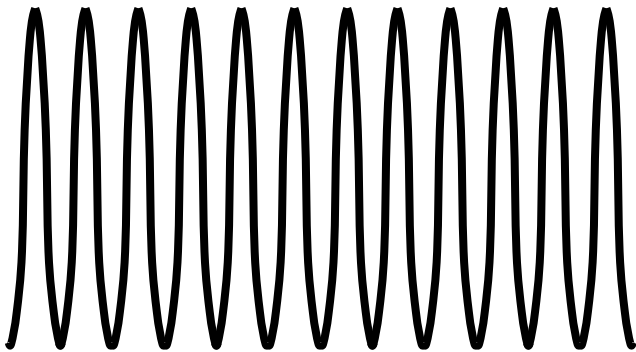
- a. **11**
- b. 12
- c. 13
- d. 6

36. What is the waves frequency?

- a. **400 hz**
- b. 366 hz
- c. 120 hz
- d. 40 hz

37. What is its wavelength?

- a. **0.8 m**
- b. 12 m
- c. 8 m
- d. 80 m

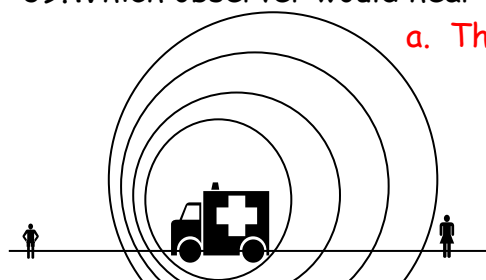


38. Sound travels faster in water than...

- a. steel.
- b. **air.**
- c. Aluminum
- d. space

39. Which observer would hear the louder sound?

- a. **The lady**
- b. The man
- c. They both do



41. A singer shattering crystal glass with her voice is a demonstration of...

- a. resonance.
- b. sound refraction.
- c. an echo.
- d. interference.

42. The three primary colors of light for additive color mixing are...

- a. red, green, and blue.
- b. yellow, green, and blue.
- c. red yellow, and blue
- d. red, yellow, and green

43. When red and blue light shine on a white sheet, the resulting color is...

- a. yellow.
- b. blue.
- c. cyan.
- d. green.
- e. magenta.

44. When red and green light shine on a white sheet, the resulting color is...

- a. blue.
- b. green.
- c. yellow.
- d. magenta.
- e. cyan.

45. The cyan color of ocean water is evidence that the water absorbs...

- a. yellow.
- b. green.
- c. orange.
- d. blue.
- e. red.

46. Compared to its speed in air, the speed of light in water is...

- a. slower.
- b. the same.
- c. faster.

47. Refraction is caused by...

- a. waves encountering a gap.
- b. more than one reflection.
- c. displaced images.
- d. changing waves speeds at a boundary.

48. Refraction...

- a. can occur when a wave changes speed.
- b. cannot occur at a boundary
- c. only occurs with mechanical waves
- d. only occurs with light waves

49. A penny lies in the bottom of a tea cup filled with water. As you look down on the penny, compared to its actual depth, it looks...

- a. closer.
- b. farther away.
- c. at the same depth.

50. The image produced by a plane mirror is...

- a. real
- b. virtual
- c. magnified
- d. inverted