

Unit 2 (Waves) Study Guide:

1. What is a wave?

Waves transfer energy from one place to another without the transfer of matter.

2. What do waves transfer?

Energy

3. What are the two types of waves?

Mechanical

Electromagnetic

4. What are the two types of wave movement?

Transverse- The motion of the medium is perpendicular to the motion of the wave

Longitudinal-The motion of the medium is parallel to the motion of the wave

5. Any substance that a wave moves through is called a **medium**.

6. What type of wave is a sound wave? What type of movement does a sound wave have?

Sound waves are **mechanical** waves with **longitudinal** movement.

7. Which type of wave can move through empty space?

Electromagnetic

8. When a wave hits a new material and bounces back, **reflection** occurs.

9. When a wave bends as it moves through a new medium **refraction** occurs.

10. How are wavelength and frequency related?

The higher the frequency, the shorter the wavelength.

The shorter the wavelength, the higher the frequency.

11. Sound waves travel **slower** (faster or slower) through liquids and gases.

12. How high or low a sound is called its **pitch**.

13. An object with a high frequency will make a **high** (high or low) pitched sound.

14. The force of air from the lungs causes the **vocal cords** to **vibrate**.

15. How are different colors of light separated?

Dispersion occurs when light white is separated into different colors by refraction, through a prism.

16. Which color has the least energy?

Red

17. Which color has the most energy?

Violet

18. White **reflects** (absorbs or reflects) all colors of light & **absorbs** (absorbs or reflects) none.

19. Black **absorbs** (absorbs or reflects) all colors of light & **reflects** (absorbs or reflects) none.

20. Other colors such as violet **absorbs** (absorbs or reflects) all colors except **what we see (violet)**.

21. Give the function of each of the following eye parts:

Part	Function
Cornea	Clear covering to protect the eye.
Iris	Controls how much light enters the eye.
Lens	Refracts light, and helps focus images.
Pupil	Allows light to pass through to your eye.
Retina	Layer of tissue on the back of the eye that gather information.
Optic Nerve	Connects the eye to the brain.

22. Label the six parts listed above on the eye model to the right.
 23. Compare earthquake, sound, and light waves.

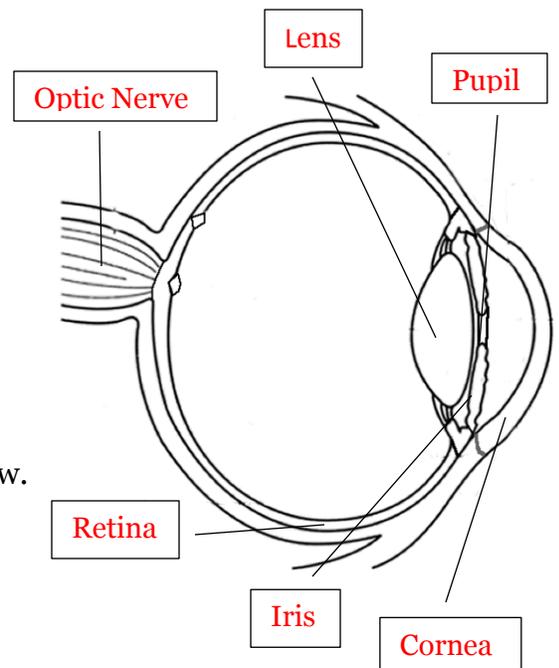
Sound and seismic waves (earthquakes) are both mechanical waves, while light waves are electromagnetic waves.

24. How are visible light, the electromagnetic spectrum, and sight related?

Visible light is the part of the electromagnetic spectrum that we can see.

25. How are sound and light different? Complete in the chart below.

	Light	Sound
Type	Electromagnetic	Mechanical
Movement	Transverse	Longitudinal
Speed	Faster than sound	Slower than light
Needs a Medium	No	Yes
Can Travel Forever	Yes	No



26. How are mechanical and electromagnetic waves different?

Mechanical waves travel through a medium, while electromagnetic do not. Mechanical waves can not travel indefinitely, while electromagnetic can.

27. What effect does material have on sound?

The speed of sound is faster in solids than in liquids and gases.

28. What effect does temperature have on sound?

The temperature of materials affects their state of matter and particle movement. Warmer materials allow sound to travel through them more quickly.

29. Ms. Bricker looked through the window at a rainbow. What type of light wave behavior is this?

Refraction

30. Mr. Stevenson admired a stain glass statue. What type of light wave behavior is this?

Absorption

31. If Susie has thicker vocal cords than Molly, how will their voices be different?

Susie will have a lower pitched voice than Molly.

32. Compare how light wave behaviors are related to how materials transmit light.

Transparent materials relate to the light wave behavior of transmission.

Translucent materials relate to the light wave behavior of scattering.

Opaque materials relate to the light wave behavior of absorption.

33. Give the function of each of the following ear parts.

Part	Function
Pinna	Acts as a funnel to direct sound into the ear.
Lobule (Ear Lobe)	Maintain balance and temperature in the ear.
Vestibular Nerve	Transmit information from the inner ear to the brain.
Cochlear Nerve	A sensory nerve that transmits information from the cochlea (tiny hair like structures) to the brain.
Tympanic Cavity (Middle Ear)	Interprets vibration used in the detection of sound.
Tympanic Membrane (Eardrum)	Separates the outer and middle ear. Transmits vibrations in the air to the bones in the middle ear.
Malleus	Transmits sound from the eardrum to the inner ear.
Incus	Receives sound from the malleus and further transmits.

34. Label the eight parts listed above on the ear to the right.

35. What are the four types of energy? Define them.

1. Thermal Energy- the total amount of energy from the movement of particles in matter.
2. Mechanical Energy- when two objects push or pull on each other over a distance.
3. Electrical Energy- Electrical source (generator or battery) is connected in a complete circuit to an electrical device.
4. Electromagnetic Energy- Radiation travels over a distance through space.

36. Thermal energy is transferred through a material by the collision of atoms within the material.

37. Heat always travels from hot to cold.

38. Name and define the three ways heat energy is transferred.

1. Conduction- the transfer/spreading of thermal energy when two objects with different temperatures are in contact/touch.
2. Convection- the transfer/spreading of thermal energy in a gas or liquid by movement of currents (hot rises, cool sinks)
3. Radiation- electromagnetic waves that directly transport energy through space.

39. Which process allows heat to travel though solids?

Conduction

40. Which process allows heat to travel through liquid & gas?

Convection

41. Which process allows heat to travel across distances?

Radiation

42. Give two examples of conduction.

Answers will vary

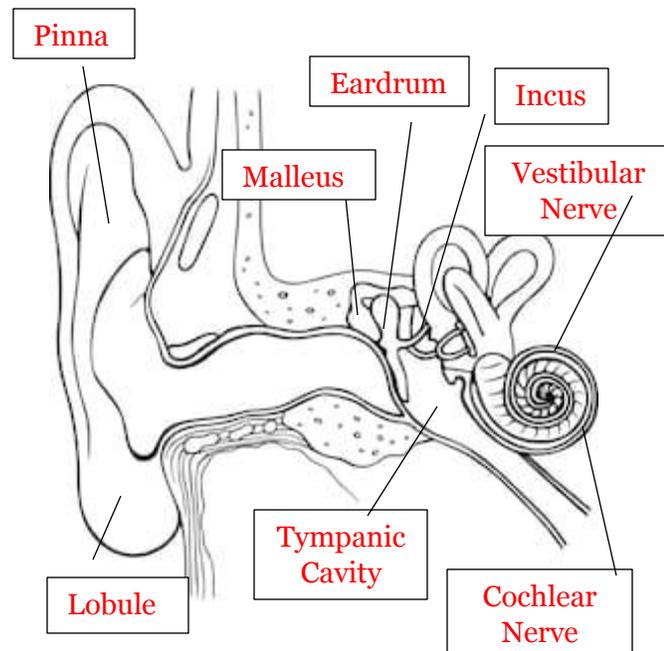
43. Give two examples of convection.

Answers will vary

44. Give two examples of radiation.

Answers will vary

45. Complete the chart below.



	Definition	Examples (at least two)
Thermal Conductor	Materials that conduct heat readily.	Aluminum Steel Copper
Thermal Insulator	Materials that do not conduct heat and limit heat transfer.	Pot handles Spatulas Plastic Utensils Wooden Utensils
Electrical Conductor	Material through which an electrical current can flow easily.	Copper (most common metal) Silver Graphite
Electrical Insulator	Materials through which an electrical current does not readily flow.	Rubber Glass Porcelain Ceramic

