Name _____ __ Extra-Credit
__ Substitution for _____

Exercises

26.1 The Origin of Sound (page 515)

Match each sound source with the part that vibrates.

	Sound Source	Vibrating Part
_____	**1.** violin	a. strings
_____	**2.** your voice	b. reed
_____	**3.** saxophone	c. column of air at the mouthpiece
_____	**4.** flute	d. vocal chords

5. Sound waves are a type of _____ wave.

6. What normally determines the frequency of sound waves?

_____

_____

7. Define pitch.

_____

8. As people grow older, they often have more trouble hearing sounds at the _____ end of the range of frequencies.

9. Sound waves with frequencies below the normal range are _____ waves.

10. Sound waves with frequencies above the normal range are _____ waves.

26.2 Sound in Air (pages 515–517)

11. Is the following sentence true or false? Sound vibrates the air much like particles move back and forth along a stretched spring. _____

12. A pulse of compressed air is called a _____, and a pulse of low-pressure air is called a _____.

13. For all wave motion, it is not the _____ that travels, but a _____ that travels.

14. Explain what happens when a tuning fork is struck against one end of an open tube.

_____

_____

_____

26.3 Media That Transmit Sound (page 517)

15. What did Native Americans learn long ago when they put their ears to the ground?

_____

_____

16. Suppose a friend far away taps a metal fence. Circle the letter of the true statement.

a. The sound is softer and travels slower through the metal than through air.

b. The sound is louder and travels slower through the metal than through air.

c. The sound is softer and travels faster through the metal than through air.

d. The sound is louder and travels faster through the metal than through air.

17. Circle the letter of the best conductor of sound.

a. a gas b. a liquid

c. a solid d. a vacuum

18. Suppose a ringing bell is placed inside a sealed jar filled with air. The air is then removed from the jar, creating a vacuum. Describe the difference in what a person nearby hears before and after the air is removed from the jar.

_____

_____

_____

26.4 Speed of Sound (page 518)

19. Is the following sentence true or false? During a thunderstorm, you hear the thunder before you see the lightning. _____

20. The speed of sound in a gas depends primarily on _____ and _____.

21. Circle the letter of the speed of sound in dry air at 0°C.

a. 20 m/s b. 330 m/s

c. 60 m/s d. 1200 m/s

22. _____ in the air increases the speed of sound in air.

23. For each degree increase in air temperature above 0°C, the speed of sound in air increases about _____ m/s.

24. The speed of sound at normal room temperature is about _____.

25. Do lighter gas particles transmit sound faster or slower than heavier gases found in air? _____

26. Is the following sentence true or false? The speed of sound in a solid material depends not on the material's density, but on its elasticity.

_____

26.5 Loudness (page 519)

27. What is the intensity of sound proportional to?

_____

28. Is the following sentence true or false? Sound intensity is a physiological sensation, but loudness can be measured by instruments. _____

Sound Levels	
Source of Sound	**Level (dB)**
Jet engine, at 30 m	140
Old subway train	100
Average factory	90
Normal speech	60
Library	40

29. Study the table above. Circle the letter beside the source of sound that is 100 times as intense as the normal sound of a library.

a. Jet engine, at 30 m
b. Old subway train
c. Average factory
d. Normal speech

30. Physiological hearing damage begins at exposure to _____ decibels.

31. Is the following sentence true or false? The cells of the receptor organ in the inner ear do not regenerate. _____

26.6 Natural Frequency (page 520)

32. Define natural frequency.

_____

33. Circle the letter of the properties upon which an object's natural frequency depends.

a. elasticity and shape
b. mass and shape
c. volume and elasticity
d. volume and mass

34. Is the following sentence true or false? A natural frequency is one at which maximum energy is required to produce forced vibrations.

_____

26.7 Forced Vibration (page 520)

35. Why is the sound made by an unmounted tuning fork faint when compared to the sound of the fork when its base is on a tabletop?

_____

_____

36. Define forced vibration.

_____

_____

37. The part of any stringed musical instrument that undergoes forced vibration and makes the sound you hear is a _____.

26.8 Resonance (pages 521–522)

38. Define resonance.

_____

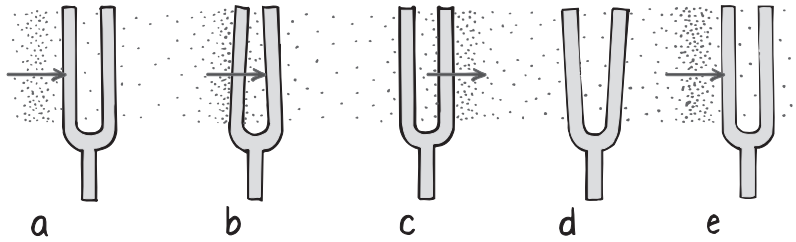
_____

_____

39. Describe how a child's swing illustrates resonance.

_____

_____



40. Describe what is happening to the tuning fork shown in the figure above.

a. _____

b. _____

c. _____

d. _____

e. _____

41. Describe how resonance affects the way you listen to a radio.

_____

_____

26.9 Interference (pages 522–523)

42. A _____ of a sound wave corresponds to a crest of a transverse wave.

43. A _____ of a sound wave corresponds to a trough of a transverse wave.

44. When the crests of one wave overlap the crests of another wave, there is _____ interference and an increase in _____.

45. When the crests of one wave overlap the troughs of another wave, there is _____ interference and a decrease in _____.

46. Is the following sentence true or false? Constructive sound interference is a useful property in antinoise technology. _____

47. Describe how antinoise technology is used to protect the hearing of jackhammer users.

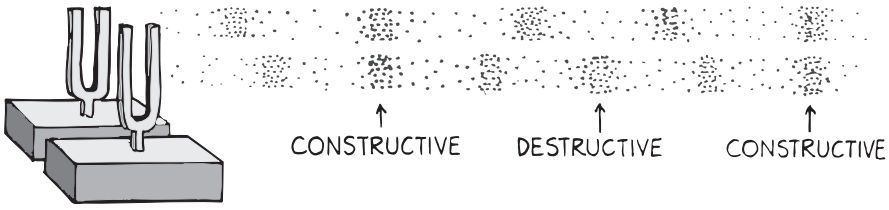
_____

_____

_____

26.10 Beats (pages 524–525)

Use the figure below to answer Questions 48 and 49.



48. Use the figure to explain how beats are formed.

_____

_____

_____

_____

_____

49. Suppose one tuning fork in the figure vibrates 264 times per second, and the other vibrates 262 times per second.

a. How often are the forks in step? _____

b. What is the frequency of beats? _____

50. Is the following sentence true or false? If a piano tuner hears beats, the piano is out of tune. _____