

CHAPTER

8

TEKS/TAKS TEST PREPARATION FOR SCIENCE

Practice Test A 

- 1** Which of the following is NOT true of sound?
- A** It is caused by vibrations.
 - B** It travels as a wave.
 - C** It does not require a medium.
 - D** It can travel through different media.

Speed of Sound in Different Gases at 0°C	
Medium	Speed (m/s)
Air	331
Helium	972
Hydrogen	1290
Oxygen	317

- 2** If all of the gases above were at 208°C, through which gas would you predict sound would travel the slowest?
- F** Air
 - G** Helium
 - H** Hydrogen
 - J** Oxygen

Frequencies Detected by Different Products	
Product	Range of detection (Hz)
Bat Ear 3000	8000–200,000
DetectSound	20–50,000
The Frequilizer	200–150,000
Virtual Ear	200–20,000

- 3** Draw inferences from the chart above to determine which noise detector would NOT detect a sound with a frequency of 500 Hz.
- A** Bat Ear 3000
 - B** DetectSound
 - C** The Frequilizer
 - D** Virtual Ear

- 4** Latisha generated a longitudinal wave in a coiled spring toy in order to model a sound wave. Which of the following is a limitation of Latisha’s model?
- F** She could not model compressions.
 - G** She could not model rarefactions.
 - H** Sound waves do not move in only one direction.
 - J** Sound waves are not longitudinal waves.
- 5** If you were conducting an experiment to determine the speed of sound, which factor would you want to consider in order to formulate a testable hypothesis?
- A** The source of the sound
 - B** The temperature of the medium
 - C** The loudness of the sound
 - D** The amplitude of the sound wave

Speed of Sound in Air	
Temperature (°C)	Speed (m/s)
0	331
20	343
25	346
100	366

- 6** In an experiment, Malik is determining the speed of sound in air at different temperatures. According to the data above, which of the following statements is true?
- F** Temperature does not affect the speed of sound in air.
 - G** As temperature increases, the speed of sound in air decreases.
 - H** As temperature increases, the speed of sound in air increases.
 - J** As temperature decreases, the speed of sound in air increases.

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CHAPTER

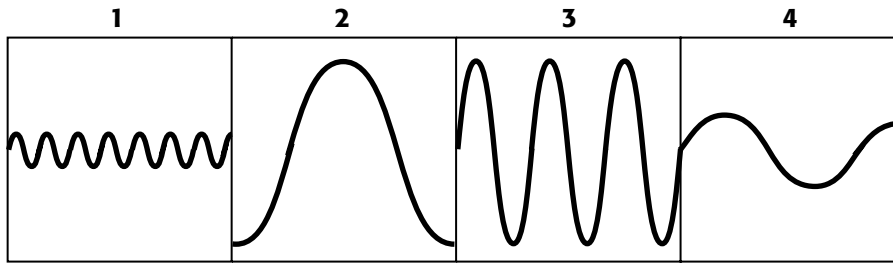
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TEKS/TAKS TEST PREPARATION FOR SCIENCE

Practice Test B 

- 1** As part of a field investigation on the nature of sound, Libby drew conclusions about what happens when a person plays the guitar. Which of the following is a valid conclusion?
- A** Matter from the hand causes energy to vibrate, producing sound.
 - B** Energy from the hand causes matter to vibrate, producing sound.
 - C** The guitar produces energy and matter, both of which vibrate away from the guitar.
 - D** Energy and matter interact to produce the guitar.
- 2** Which of the following is NOT a true statement about what happens when a guitar is played?
- F** The strings of the guitar are vibrating.
 - G** Sound moves as a longitudinal wave away from the guitar.
 - H** Particles of air are carried farther and farther away from the guitar with each sound wave.
 - J** Sound moves away from the guitar in all directions.
- 3** Cletus wants to make ear protectors for people who work around loud jet engines. Which of the following materials should he experiment with for best results?
- A** A material that amplifies sound
 - B** A material that absorbs sound
 - C** A material that transmits sound
 - D** A material that produces sound
- 4** During a laboratory experiment about the nature of sound, Jesse walked into a large, dark room and yelled "Hello!" She heard a strong echo of the word almost immediately. Which of the following is a valid conclusion Jesse could draw from her observations?
- F** The room has smooth, hard walls and few things in it.
 - G** The room is full of pillows and other soft objects.
 - H** The room has no walls.
 - J** The room is very cold.

Chapter 8 Practice Test B, continued



5 During a laboratory investigation, Aaron used an oscilloscope to create graphs of sounds he produced using a whistle. The graphs are shown above. Which graph shows the lowest-pitched sound?

- A** Graph 1
- B** Graph 2
- C** Graph 3
- D** Graph 4

6 Which of the graphs above shows the softest sound (lowest volume)?

- F** Graph 1
- G** Graph 2
- H** Graph 3
- J** Graph 4

7 Which of the graphs above shows both a high volume and a high pitch?

- A** Graph 1
- B** Graph 2
- C** Graph 3
- D** Graph 4

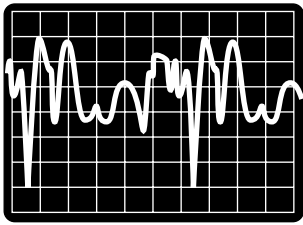
8 Which of the graphs above shows a sound that would be most likely to resemble the sound made by a female opera singer hitting a high note?

- F** Graph 1
- G** Graph 2
- H** Graph 3
- J** Graph 4

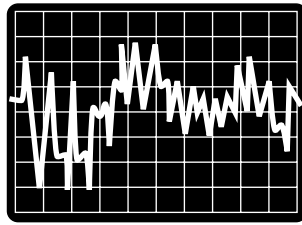


Chapter 8 Practice Test B, continued

- 9** The cello is an instrument made up of strings and a wooden body. What purpose does the cello's wooden body serve in the production of sound?
- A** The body produces energy.
 - B** The body decreases the amplitude of the sound.
 - C** The body resonates with the vibration of the strings, making the sound louder.
 - D** The body absorbs the sound of the vibrating strings.



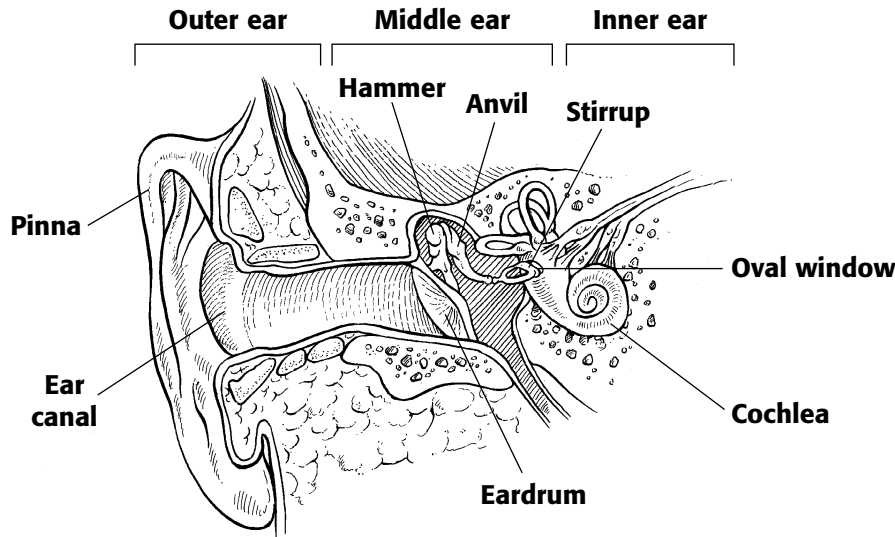
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- 10** Miguel used an oscilloscope to produce graphs of two different sounds in a laboratory investigation. Look at the two graphs. Which is music and which is noise?
- F** Graph 1 is music because it has a higher amplitude.
 - G** Graph 2 is music because it has more compressions.
 - H** Graph 2 is music because it shows no repeating pattern.
 - J** Graph 1 is music because it shows a repeating pattern.
- 11** What valid conclusion can be drawn about the volume in each of the graphs above?
- A** Graph 1 shows the sound with the loudest volume.
 - B** Graph 2 shows the sound with the loudest volume.
 - C** Both sounds have about the same volume.
 - D** It is impossible to determine sound volume by looking at the graphs.
- 12** Which of the following most accurately describes how sound waves move?
- F** Sound waves move as a series of compressions and rarefactions.
 - G** Sound waves move as oscillating transverse waves.
 - H** Sound waves only move through air.
 - J** Sound waves travel from one place to another as electrical signals.

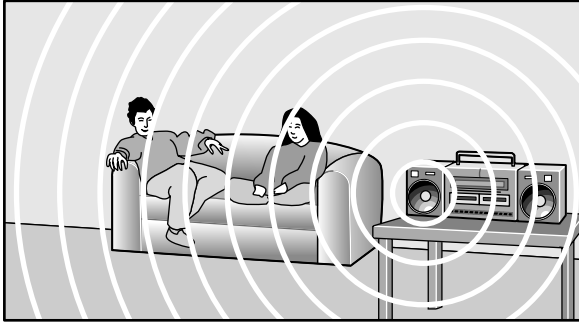
Chapter 8 Practice Test B, continued



- 13** Tiffany drew the diagram above during a laboratory experiment. Where do sound waves enter the ear?
- A** Middle ear
 - B** Inner ear
 - C** Outer ear
 - D** Cochlea
- 14** Which statement best describes what happens in the inner ear?
- F** Sound vibrations are changed into electrical signals.
 - G** Sound waves enter the ear and are channeled through the ear canal.
 - H** Sound waves are amplified by the hammer, anvil, and stirrup.
 - J** Electrical signals are interpreted.
- 15** Claire suspects that loud rock concerts might damage the hearing of people who work in stadiums where rock concerts are held. She designs an experiment to see whether or not she is right. What might her hypothesis be?
- A** People who work in stadiums enjoy rock music more than other people.
 - B** People who work in stadiums have larger ears than people who don't work in stadiums.
 - C** People who work in stadiums wear ear protection.
 - D** People who work in stadiums are less able to hear faint sounds than people who don't work in stadiums.

Chapter 8 Practice Test B, continued

- 16** Which of the following pieces of laboratory equipment would be used to measure the amplitude of a sound wave?
- F** A calculator
 - G** A ruler
 - H** An oscilloscope
 - J** A stopwatch



- 17** Look at the model of how a sound wave moves. What is one limitation to this model?
- A** Sound waves do not move away from their source in all directions as the model shows.
 - B** As sound waves bump into objects, they are reflected and move in new directions. This is not shown in the model.
 - C** Sound waves do not spread out as they move away from their source in the way the model shows.
 - D** Not Here
- 18** Where can sound not travel?
- F** Through air
 - G** Through water
 - H** Through glass
 - J** Through empty space
- 19** What feat did Chuck Yeager accomplish in 1947 in his X-1 airplane?
- A** He flew faster than the speed of light.
 - B** He flew faster than the speed of sound.
 - C** He flew into space.
 - D** He flew without making a sound.

Answer Key and TAKS Doctor for Practice Test A

Answers	TEKS Correlation	TAKS Objectives
1 C	8.7B	5
2 J	8.4B	1
3 A	8.3B	
4 H	8.3C	1
5 B	8.2A	1
6 H	8.2C	1



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 1 asks students which of the statements is not true of sound.

A Incorrect. Sound is caused by vibrations of air particles.

B Incorrect. Sound travels as a longitudinal wave.

C Correct. Sound does require a medium, such as air, through which to travel.

D Incorrect. Sound not only travels through air but also travels through other media.

Item 4 asks students to identify a limitation of a coiled spring toy as a model for sound waves.

F Incorrect. Compressions in the coiled spring toy are areas where the coils are close together.

G Incorrect. Rarefactions in the coiled spring toy are areas where the coils are far apart.

H Correct. A sound wave travels in all directions away from its source, while the wave in the coiled spring toy travels in only one direction.

J Incorrect. Like the waves on the coiled spring toy, sound waves are longitudinal waves.

Item 5 asks students which factor they would want to consider if they were planning an experiment to test the speed of sound.

A Incorrect. The source of the sound does not affect the speed at which sound travels.

B Correct. The speed of sound depends on the temperature of the medium through which sound travels.

C Incorrect. The loudness of a sound is related to its amplitude, not its speed.

D Incorrect. The amplitude of a sound does not depend on its speed.

Answer Key and TAKS Doctor for Practice Test B

Answers	TEKS Correlation	TAKS Objectives	Answers	TEKS Correlation	TAKS Objectives
1 B	8.2D	1	11 C	8.2D	1
2 H	8.7B	5	12 F	8.7B	5
3 B	8.2C	1	13 C	8.2C	1
4 F	8.2D	1	14 F	8.2C	1
5 B	8.2C	1	15 D	8.2A	1
6 F	8.2C	1	16 H	8.4A	1
7 C	8.2C	1	17 B	8.3C	1
8 H	8.4B	1	18 J	8.7B	5
9 C	8.7B	5	19 B	8.3E	1
10 J	8.2C	1			



The following TAKS questions have been diagnosed by the TAKS Doctor. Find out what might be causing your “ailing” answers. The TAKS Doctor will see you now!

Item 2 asks students to analyze a diagram of sound waves emanating from a guitar and identify the statement about the interaction of matter and energy that is not true.

- F Incorrect.** The strings of the guitar are vibrating, and it is this vibration that produces the sound waves. This is a true statement.
- G Incorrect.** Sound waves do move as longitudinal waves, and they do move away from the guitar. Therefore, this statement is accurate.
- H Correct.** Particles of air vibrate back and forth, but they do not move with the wave away from the source of the sound.
- J Incorrect.** Sound waves do move in all directions from the source.

Item 3 asks students to select an appropriate material for an investigative procedure.

- A Incorrect.** A material that amplifies sound would make the sound louder and would be an inappropriate material for protecting someone’s ears.
- B Correct.** A material that absorbs sound would make the sound softer and would be an appropriate material for protecting someone’s ears.
- C Incorrect.** A material that transmits sound allows the sound to move through the material and would be an inappropriate material for protecting someone’s ears.
- D Incorrect.** A material that produces sound would make even more sound and would be an inappropriate material for protecting someone’s ears.

Item 4 asks students to identify a valid conclusion that could be drawn based on observations made in a laboratory experiment about echoes.

- F Correct.** Echoes are produced in rooms with smooth, hard walls and few obstacles.
- G Incorrect.** Soft objects absorb sound, and an echo would not be produced if the room were full of soft objects.
- H Incorrect.** If the room had no walls, the sound could not be reflected and no echo would form.
- J Incorrect.** Temperature does not affect the tendency of sound to form an echo. Therefore, it is not valid to conclude that the room is very cold.

Item 7 asks students to analyze data in a graph.

- A Incorrect.** Graph 1 represents a sound with a small amplitude and a short wavelength, so this sound has a low volume and a high pitch.
- B Incorrect.** Graph 2 represents a sound with a large amplitude and a long wavelength, so this sound has a high volume and a low pitch.
- C Correct.** Graph 3 represents a sound with a large amplitude and a short wavelength, so this sound has a high volume and a high pitch.
- D Incorrect.** Graph 4 represents a sound with a small amplitude and a long wavelength, so this sound has a low volume and a low pitch.

Item 8 asks students to make inferences from direct evidence.

- F Incorrect.** The sound produced by a female opera singer hitting a high note would most likely have a high volume and a high pitch. The volume of the sound represented by Graph 1 is not loud enough.
- G Incorrect.** The sound produced by a female opera singer hitting a high note would most likely have a high volume and a high pitch. The pitch of the sound represented by Graph 2 is not high enough.
- H Correct.** The sound produced by a female opera singer hitting a high note would most likely have a high volume and a high pitch. The sound represented by Graph 3 has a high volume and a high pitch.
- J Incorrect.** The sound produced by a female opera singer hitting a high note would most likely have a high volume and a high pitch. The pitch and the volume of the sound represented by Graph 4 are not high enough.

Item 10 asks students to make inferences from direct evidence.

- F Incorrect.** Amplitude determines the loudness of a sound, but it does not determine whether a sound is music or noise.
- G Incorrect.** The number of compressions in a given time indicates the frequency of the sound, but it does not determine whether a sound is music or noise.
- H Incorrect.** A graph that has no repeating pattern indicates that the sound is noise.
- J Correct.** A graph that has a repeating pattern indicates that the sound is likely to be music.

Item 13 asks students to make inferences on how the ear detects sound by examining a diagram of the human ear.

- A Incorrect.** The middle ear is the part of the ear where the amplitude of sound vibrations is increased.
- B Incorrect.** The inner ear is the part of the ear where vibrations created by sound are changed into electrical signals for the brain to interpret.
- C Correct.** The outer ear is the part of the ear that directs sound waves into the middle ear.
- D Incorrect.** The cochlea is an organ in the inner ear that converts sound waves into electrical signals.

Item 14 asks students to determine the function of the inner ear.

- F Correct.** In the inner ear, sound vibrations are converted into electrical signals that are sent to the brain to interpret.
- G Incorrect.** The outer ear acts as a funnel for sound waves, collecting sound waves and directing them to the middle ear.
- H Incorrect.** In the middle ear, the hammer, the anvil, and the stirrup act as levers to increase the size of the sound vibrations.
- J Incorrect.** The brain interprets electrical signals from the inner ear.

Item 16 asks students to select equipment for a laboratory investigation to measure the amplitude of a sound wave.

- F Incorrect.** A calculator is used to perform mathematical functions.
- G Incorrect.** A ruler is used to measure length.
- H Correct.** An oscilloscope is used to graph representations of sound waves so that their amplitudes can be determined.
- J Incorrect.** A stopwatch is used to measure time.