

The Sounds of Baseball

By Michael Stahl



Human beings hear sounds constantly. Sounds are the result of vibrations. When an object vibrates, it sets off a chain reaction of events that might end up inside a person's ear. After a vibration of any kind, the molecules of the object knock into the molecules of air that surround it, or possibly the molecules of another object next to it. Air molecules bash into each other like millions of microscopic Ping-Pong balls, transporting the sound through what becomes a sound wave. Depending on how strong or soft the vibrations are, the sound's volume and tone will vary. Eventually, a human's ears hear the vibrations.

A person's ears pick up vibrations everywhere they go, but there might not be many places that offer as many different sounds coming from so many different sources as a baseball game.

While sitting in a seat at a game, one of the first sounds someone might hear would be that of a hot dog vendor. "Hot dogs here! Get your hot dogs here!" they might yell. The sound of their high-pitched voice begins in their voice boxes. Inside peoples' throats are wiry looking parts that vibrate when a person wants to make a sound and communicate their thoughts to others. The voice box vibrates and the beginnings of sound waves that shoot through the stadium's air are rooted there. The energy created by the vibrations sends the air molecules into unrest. In turn, this creates air pressure from all that wild movement of the molecules smashing into one another, that nobody can see, but they can certainly hear. Finally, those sound waves of vibrations make a connection inside a person's ear. The brain then recognizes the waves as a person's voice, offering a warm, yummy traditional baseball game treat. Once

that happens, a person might almost have no choice but to yell back at the salesman using their own voice boxes, "I'll have a hot dog, please!"

Later in the game, if the home team has some men on base, what is known as a "rally" is beginning. The team that just about everyone is there to cheer on might be close to scoring some runs. Inside the stadium, there is an organ player, waiting for a chance to get the crowd riled up. The start of a rally is the perfect time for him or her to do just that.

One of the most popular and recognizable little tunes that an organ player might use to get all of the fans to cheer is the jingle that signals everyone to yell "Charge!" at its conclusion. Some quick, deep notes in a rhythm that gets faster and faster, and higher and higher are played. For a moment, the music stops completely, but comes right back with a high-pitched, racy tune, which everyone hears and just knows to shout "Charge!" at the end of. With any luck, the home team will do so and score a run or two.

The organ located somewhere inside the building is hooked up electronically to tremendous speakers that are usually built next to the scoreboard. Though they might be hard to see, behind the front of the speakers' covering are large circular parts called "cones." The cones receive pulses from the organ electrically that began when the organist hit the keys. The cones can transmit the sounds because they are able to vibrate in just the right way for the sound waves to be created accurately. The cones are different sizes so that they can properly send out different pitches, with the smaller ones vibrating quicker, making high tones, while the big cones create low sounds. The combination of just the right vibrations creates sound waves that enter the atmosphere and reach the ears of the fans, making them happy and ready to cheer.

One other favorite sound of many people at a baseball game is the crack of the bat when it hits a ball. Usually, fans recognize that sound as something good happening for their team: a base hit, or maybe even a home run. The pitcher throws his baseball towards home plate. The batter quickly decides if he should swing or not. If he does and times everything perfectly, he will place his bat in front of the ball, making a connection between the two. Because the ball was traveling in one direction and the bat forces it back the other way, rapid vibrations in both the bat and the ball occur when they smack into each other. Those vibrations quickly cause the air molecules to vibrate too and the sound waves are created. Microseconds later, the fans in the seats hear the hit, and use their vocal chords to start new vibrations of cheer!

Name: _____ Date: _____

1. What are sounds the result of?
 - A air molecules
 - B ears
 - C voice boxes
 - D vibrations

2. What main examples are described in the text to illustrate how sounds are created?
 - A hot dog vendor shouting, the bat hitting the ball, the ball hitting the ground
 - B people speaking into microphones, the organ playing music, the bat hitting the ball
 - C hot dog vendor shouting, the organ playing music, the bat hitting the ball
 - D hot dog vendor shouting, the organ playing music, the fans clapping

3. After a sound is made there is a delay before a person is able to hear it. What evidence from the text supports this conclusion?
 - A Fans in the stadium hear the sound the bat makes when it hits the ball microseconds after impact.
 - B After a vibration of any kind, the molecules of the object knock into the molecules of air.
 - C Fans hear the hit of the bat and use their vocal cords to start new vibrations of cheer.
 - D Sound waves of vibrations make a connection inside a person's ear.

4. Which of the following occurs when a person's brain processes sound?
 - A The brain starts to send the molecules around it into unrest.
 - B The brain also determines whether it is a familiar sound or not.
 - C The brain sends the sound waves to the ear.
 - D The brain starts to vibrate.

5. What is this passage mainly about?
 - A the way air molecules bash into each other
 - B examples of sound being created at a baseball game and the science behind the sounds
 - C how sound waves of vibrations make a connection inside a person's ear
 - D baseball games, hot dog vendors, and organs

6. Read the following sentence: "After a vibration of any kind, the molecules of the object knock into the molecules of air that surround it, or possibly the molecules of another object next to it. Air molecules **bash** into each other like millions of microscopic Ping-Pong balls, transporting the sound through what becomes a sound wave."

What does the word "**bash**" most nearly mean?

- A get stuck
- B melt
- C to hit hard
- D run away

7. Choose the answer that best completes the sentence below.

_____ the hot dog vendor to yell out, his voice box vibrates first.

- A And
- B After
- C Because
- D In order for

8. Why does a baseball bat make a sound when it hits the ball at a baseball game? Support your answer with information from the text.

9. Explain how a hot dog vendor is able to yell out "hot dogs are here!" for others to hear at a baseball game.

10. Explain how sound waves are created and why they must be created for a person to hear sound. Use information from the text to support your answer.

Teacher Guide & Answers

Passage Reading Level: Lexile 1150

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3. After a sound is made there is a delay before a person is able to hear it. What evidence from the text supports this conclusion?

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8. Why does a baseball bat make a sound when it hits the ball at a baseball game? Support your answer with information from the text.

Suggested answer: Students should explain that because the ball was traveling in one direction and the bat forces it back the other way, rapid vibrations in both the bat and the ball occur when they smack into each other. Those vibrations quickly cause the air molecules to vibrate too and the sound waves are created. These sound waves are picked up by the fans’ ears and processed by their brains, allowing them to hear the impact.

9. Explain how a hot dog vendor is able to yell out “hot dogs are here!” for others to hear at a baseball game.

Suggested answer: Students should explain that inside of the vendor’s throats are wiry looking parts that vibrate when a person wants to make a sound and communicate their thoughts to others. The voice box vibrates and the beginnings of sound waves that shoot through the stadium’s air are rooted there. The energy created by the vibrations sends the air molecules into unrest. In turn, this creates air pressure from all that wild movement of the molecules smashing into one another, that nobody can see, but they can certainly hear. Finally, those sound waves of vibrations make a connection inside a person’s ear.

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