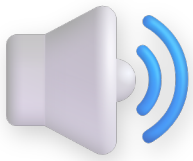
How Things Work

Grade 5 Name: _____

Read the passage carefully. Then answer the questions using details from the text.

How Speakers Turn Electricity Into Sound



Have you ever wondered how your favorite music or the sound from a movie reaches your ears? Speakers are amazing devices that turn invisible electricity into audible sound waves. Found in headphones, televisions, and concert halls, they work by creating vibrations that travel through the air to our ears.

The magic starts with an electrical signal. When you play music, the audio device sends an electrical current that rapidly changes direction and strength. This current travels through a thin wire coil, called a voice coil, which is attached to a cone-shaped diaphragm. Around the voice coil is a powerful, stationary magnet.

When the electrical current flows through the voice coil, it creates a temporary magnetic field around the coil. Because the current is constantly changing, this magnetic field also changes, rapidly switching between attracting and repelling the stationary magnet. This push and pull causes the voice coil to move back and forth very quickly.

Since the voice coil is connected to the speaker cone, the cone also moves back and forth like a tiny piston. This rapid movement pushes and pulls the air, creating areas of high and low pressure. These pressure changes travel through the air as sound waves, which our ears detect as sound. Different speaker sizes produce different sounds; large woofers create deep bass, while small tweeters produce high pitches.

COMPREHENSION QUESTIONS

(1) What is the main idea of this passage?

(A) Speakers use electricity and magnets to create vibrations that produce sound.

(B) The voice coil moves back and forth inside a speaker.

(C) Sound is important for enjoying music and movies.

(D) Speakers are made of plastic and metal parts.

(2) Which detail best supports the main idea?

(A) The electrical current creates a temporary magnetic field around the voice coil.

(B) Speakers are found in many electronic devices.

(C) Sound waves travel through the air to our ears.

(D) Some speakers can connect to devices wirelessly.

(3) What would be the best title for this passage?

(A) How Speakers Make Sound Waves (B) The History of Sound Devices

(C) Different Kinds of Speakers (D) Magnets and Electricity

(4) Which sentence does NOT belong in this passage?

(A) The voice coil moves back and forth because of changing magnetic fields.

(B) Speakers convert electrical signals into pressure changes in the air.

(C) Many people enjoy listening to music through speakers.

(D) Large woofers are designed to produce deep bass sounds.

(5) Write the main idea in TWO sentences. Include one supporting detail.