Senses at Work

Trace how structures turn sights, sounds, tastes, and smells into signals.

HAP.6.7 "Describe the structure and function of the special senses (i.e., vision, hearing, taste, and olfaction)."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline at least two structures for each of the four senses, then circle the words that describe what each structure does to help you trace a stimulus to the brain.

Breakfast in a Busy Cafeteria

1. At breakfast in a busy cafeteria, you spot a red apple across the room. Light reflected from the apple enters your eye through the clear cornea, which bends the light. The lens changes shape to focus the light on the retina, a layer at the back of the eye. In the retina, cone cells respond to different wavelengths of light and support color vision, while rod cells work well in dim light. These cells convert light into electrical signals. The optic nerve carries those signals to the brain, which interprets them as an image.

2. A tray crashes near your table, and you turn toward the sound. Sound waves enter the outer ear and travel down the ear canal to the eardrum, causing it to vibrate. Three tiny bones called ossicles pass along and amplify those vibrations. They reach the cochlea, a fluid-filled structure in the inner ear. Movement of its fluid bends hair cells, which convert the vibrations into electrical signals. The auditory nerve carries the signals to the brain. Your brain uses information from both ears to help locate the crash, even before you see the fallen tray.

3. You bite a slice of apple and notice its sweetness and fruity smell. Molecules from the apple dissolve in saliva and contact receptor cells inside taste buds on the tongue. These cells send signals through taste nerves, allowing the brain to detect basic tastes such as sweet and sour. Meanwhile, airborne molecules enter the nose and dissolve in mucus high inside it. Olfactory receptor cells in that lining respond to the molecules and send signals toward the brain through the olfactory nerve. The brain combines smell and taste information, so the apple's flavor seems richer than sweetness alone.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the cornea, lens, and cone cells help you see the red apple?

2. After the eardrum vibrates, what do the ossicles and hair cells do to help you hear the tray crash?

3. How do saliva, taste buds, and taste nerves work together when you taste the apple?

4. Which structures detect the apple's smell, and how does the smell information reach the brain?

3 YOUR TURN

Your own words

Invent a scene outside the cafeteria in which you notice two different stimuli with two different special senses. In 5 to 6 sentences, name at least two structures for each sense and explain how those structures help turn each stimulus into a signal for the brain.

Senses at Work

PART 1 · READ AND MARK

Underline at least two structures for each of the four senses, then circle the words that describe what each structure does to help you trace a stimulus to the brain. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the cornea, lens, and cone cells help you see the red apple?	**The cornea bends light from the apple, and the lens focuses it on the retina. Cone cells in the retina respond to the light and convert it into signals that support color vision.**
2	After the eardrum vibrates, what do the ossicles and hair cells do to help you hear the tray crash?	**The ossicles pass along and amplify the vibrations. Fluid movement in the cochlea bends hair cells, which convert the vibrations into electrical signals.**
3	How do saliva, taste buds, and taste nerves work together when you taste the apple?	**Apple molecules dissolve in saliva and contact receptor cells in taste buds. The cells send signals through taste nerves so the brain can detect tastes such as sweetness.**
4	Which structures detect the apple's smell, and how does the smell information reach the brain?	**Olfactory receptor cells in the nose respond to apple molecules dissolved in mucus. They send signals toward the brain through the olfactory nerve.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

On a snowy trail, I see a red trail marker and hear a bicycle bell. Light from the marker passes through my cornea, which bends it, and my lens focuses it on my retina. Cone cells in my retina convert the light into signals that travel through my optic nerve to my brain. Sound waves from the bell move through my ear canal and vibrate my eardrum. Ossicles pass the vibrations to my cochlea, where bending hair cells convert them into signals. My auditory nerve carries those signals to my brain, helping me notice the approaching cyclist.

Accept any accurate structures and functions supported by the passage. For Your Turn, check that the new scene includes two distinct stimuli, two different senses, and at least two correctly described structures for each sense.