LESSON PLAN: Do you HEAR that?

Topic: How the brain knows that a sound has been heard

Subjects| Stream:
Biology
Science

Grade Level:
Junior (Grades 4 to 6)

Objective(s):

- To demonstrate how the brain comprehends that a sound has been heard.
- To encourage participants to take part in a visual simulation that portrays how sound information is relayed from the ear, through movement of hairs in the ear, to a chain of neurons in the brain.

Brief Summary:

This activity teaches students about how a piece of sound information that enters the ear travels to the brain, through a chain of neurons, to allow the individual to comprehend what they have heard.

Background Information:

Everyone has hundreds of tiny hairs in their ears. At the end of these tiny hairs, towards the skin of the ear, is a cell that is analogous to a 'button' (cell) that is pressed down whenever the hairs are moved. Whenever a sound enters the ear, its vibrations move the hair follicles, pushing down on these 'buttons' and ultimately sending a message to the brain that a certain sound has been heard. The brain then tells you what sound has been heard by relaying information through a chain of neurons.

Resources:

- Enough space for participants to form rows of 6-7 students.

Activity Instructions:

Step 1: Divide the total number of participants into groups of 6-7 students and ask them to stand in rows beside each other (i.e., analogous to students lined up to play under-over).

Step 2: The student at the front of each row is designated as the EAR. The student standing behind the EAR represents HAIR. The student standing at the end of the row represents the BRAIN. All other students in the row represent NEURONS.

The students that represent neurons must stand up with their arms out to their side; they are essentially representing neurons that receive messages through the right hand, and then relay the message to another neuron (i.e., another student) through their left hand, until that message reaches the BRAIN.

Step 3: The instructor must whisper the code-word 'FIREWORK' into the ear of each student at the front of each row; ensure that the class waits to start the activity until the instructor finishes whispering the word to each chain.

When the instructor yells GO, the first student in each row (who is the EAR) must whisper the code-word to the student behind them (who represents HAIR).

Once the HAIR hears the code-word, they must shake their body to show that the hairs in the ear have moved. Simultaneously, they must whisper the code-word to the student behind them while high-fiving them (i.e., the high-five represents that the hair cells have pressed down on the 'button' (i.e., the neuron) that signals to the brain that a sound has been heard.

Each student then must whisper the code-word to each subsequent person behind them down the chain until the final student in the row (the BRAIN) has been alerted of the code-word.

The final-student (the BRAIN) must then raise their hand and whisper the code-word to the instructor (they should not yell it out loud to disrupt the other chains).

If the BRAIN whispers the correct code-word, then the neuron chain works!

Each row is competing against each other; the first row to have successfully passed along the sound-information to the BRAIN wins!

Step 4: The instructor must reiterate to the students that this activity shows how sound information is relayed from the moment it enters the ear, to its movement of the hairs in the ear, to its destination in the brain.