

Ashley Bens and Tiffany Patton
Neuro 430 Model outline

What's in your nose besides boogers?

Purpose

To try to get the kids to inquire as to how they actually smell after raising their curiosity through a series of smell tasks to identify different odors. Then to model the principles involved with olfaction, specifically the binding of odorant particles to olfactory receptor cells, the penetration of the cribiform plate and the reorganization of the receptor neurons onto the glomeruli in the olfactory bulb. The idea of this being that they will learn the general structures involved with olfaction, and the knowledge that the information gathered in this way will then be sent on to the brain for processing.

Materials

Plastic shapes for different smells, green streamers, 2 folding tables, cardboard, used lab coats, sharpies, construction paper, at least 6 kids, 8-10 different smell jars, black paint.

Procedure

Step 1: Kid's experiment

Line kids up, give each an unidentified smell jar, and have them try to identify what the smell is inside. Then have them pass the jar to their left. Now ask them how they think they knew what was in the jar.

Step 2: Show them how they were able to identify the smells.

2 groups of 3 kids each, compete in a relay race in order to turn an odorant into a signal that will go to the brain. Kid 1 will mimic the dissolving of an odorant molecule through the mucus by carrying an odorant molecule (ball, square, triangle, etc.) as fast as possible through the mucus streamers. This kid will tag kid 2 (receptor) and kid 2 will put on a lab coat to serve as the signal, running through the cardboard cribiform plate to the proper 2nd order neuron in the olfactory bulb. Here, kid 3 will then race to "the brain," to initiate processes which allow the recognition of a scent.

Issues

Issues will include the simplification of the processes involved. Specifically the conversion of the binding of the odorant particle into a signal sent to 2nd order neurons. Also we will not go into details about how the brain processes the information in order to allow scent recognition, (e.g. shape theory) because this process is still being debated.

Lesson Plan

The 5th graders should learn how an odorant, or a scent is able to contact your nose, and how it is sent on in order to reach the brain. We will also inform the kids of the cells in the nose, and briefly discuss the cells producing mucus. We will review and ask questions about the game in order to see if the kids are able to verbalize what they have learned about this process.