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Kid's Judge Model Plan
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The Totally Tasting Tongue

Purpose:

To debunk the myth in children's science texts that receptor cells on the tongue are heavily segregated, and code for only one taste in the gustatory system. The model will provide insight into how taste receptors can code for many tastes, in a way that is very complicated and utilizes many other variables.

Materials:

Chicken wire, newspaper, starch, Plaster of Paris, acrylic paint (multiple colors), small plastic cups, poster board, children's science text, edible liquids/food representing the following tastants: sweet, salty, bitter, sour, umami, small candies (both sweet and sour).

Procedure:

A large "tongue" will be constructed, and painted into sections, in concordance with the text book. In these segregated areas will be holes in the tongue made to fit small plastic cups containing different "tastes". The liquids, however, will be randomly distributed throughout the tongue, and not according to textbook organization. Kids will look at the science text for a minute or so, and decide where they think the different receptors are organized. Each will then take a small cup containing a "taste" from a specific area (we hypothesize that the majority will choose sweet or sour) and taste it. Using the poster illustration behind us, we will then show a simplified version of the gustatory pathways from the tongue into the brain. At the end of the presentation, they will choose a candy to either "code for sweet, or code for sour".

Issues: Gustatory receptor cells on the tongue are not as segregated as once thought.

Instead, receptor cells may code for multiple tastes and share multiple pathways in the gustatory tract. The aforementioned issue will be presented as the 'take-home' message for the 5th graders. In an attempt to simplify these concepts, we will most assuredly be lacking in a certain amount of scientific accuracy. Concepts such as G-protein coupled receptors, ion channels, neuron fiber tracts and action potentials will not be part of our demonstration. However, the kids will be presented with the idea that there are many complex activities that take place in our taste cells when we put something on our tongue, and that these signals take a very complicated 'road trip' to get into the taste centers in our brain. They will learn that one taste cell does not taste just one taste, but has the capability to taste many different kinds of tastes.