Taste Test

Objective: To learn about taste receptors on your tongue and taste preferences

Materials:

1. Plastic dixie cups
2. Lemon juice
3. Instant coffee
4. Sugar
5. Salt
6. Jolly ranchers
7. Cut in half q-tips
8. Trash for used q-tips
9. Dinoxcope hooked up to a computer
10. Blue food coloring in water

Introduction:

What do we use our tongues for? What do you think those bumps on our tongue are for? So we are going to test our abilities to taste today. There are 6 flavors we can taste. One of them was just discovered in 2016. So, if something has sugar in it we say it tastes? (sweet) Lemons taste? (sour), coffee tastes or yucky tastes? (bitter), French fries and potato chips taste? (salty) and there there is savory or umami and the new one is carbohydrates so pasta and bread.

Background:

Taste is a chemical sense as is smell. **Taste buds** contain the taste receptors. They are located around the small structures known as papillae found on the upper surface of the tongue, soft palate, upper esophagus, the cheek and epiglottis.These structures are involved in detecting the five elements of taste perception: salty, sour, bitter, sweet and umami; through the combination of these elements we detect "flavors."

A popular myth assigns these different tastes to different regions of the tongue; in reality these tastes can be detected by any area of the tongue. Via small openings in the tongue epithelium, called taste pores, parts of the food dissolved in saliva come into contact with the taste receptors. These are located on top of the taste receptor cells that constitute the taste buds. The taste receptor cells send information detected by clusters of various receptors and ion channels to the gustatory areas of the brain via the seventh, ninth and tenth cranial nerves. sweet (in response to hydroxyl groups of a molecule), sour (in response to hydrogen ions, H^+, in acids), salty (in response to inorganic metallic ions such as Na^+ and K^+), and bitter (in response to alkaloids—nitrogenous bases having complex ring structures, including quinine, morphine, and nicotine).

The sense of taste is not uniform. Bitterness can be detected at 1 part per million while sweetness is detectable at a concentration of 1 part in 200. The higher sensitivity for bitterness is probably a safety mechanism. Most poisons are bitter alkaloids; Some substances can be tasted by certain individuals and not by others. These responses are, at least partially, genetically controlled.

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Experiment:

OK, so we can taste 6 flavors but I only have 4 here to taste.

Taste test:

Experiment 1:

Dip a q-tip into a flavor and have them taste it. NO DOUBLE DIPPING! You have to watch the sugar one-I save that one for last. Just have them guess but don't tell them the answer till they've gone through all the tastes.

"The flavors work like a key and the lock are the tastebuds that then send messages to your brain about what you're tasting. If you've never tasted anything sweet before, would you know it was sweet? No! You have to have that memory in your brain. Taste memories are stored here on the sides of your brain."

Experiment 2:

Prepare jolly ranchers by putting 1 in a cup with water and let dissolve. Don't let the whole jolly rancher dissolve cause it makes the flavor too potent. Hide the cups from the kids and have them close their eyes. Dip Q-tips into a flavor and hand to them and have them guess the flavor.

Tastebud dying:

Have blue food coloring in water (has to be pretty blue)
Dip in a q-tip to get it really blue and then rub it all over the tongue
The papillae should just pop out
You should hold the dinoxcope to zoom in on their tastebuds otherwise, they may lick the dinoxcope.