

Anatomy of Taste



Ages 10 - 14

Lesson Overview:

Students will learn about the different flavours and the anatomy of taste – the role of the nose, and how tongue allow them to taste certain flavours (sweet, salty, bitter, sour and umami). Students will sample the foods with the five tastes.

Learning Outcomes:

Students will:

- identify the five basic tastes.
- explain how the nose helps with tasting.
- associate different foods with the different tastes.

Materials:

- Classroom set up with a) four “tasting stations” that groups of children can circulate between or b) napkin and foods at each student’s seating place.
- Large image of a tongue that can be posted on a wall: https://commons.wikimedia.org/wiki/File:Human_tongue_taste_papillae.svg
 - red poster paper OR PowerPoint slide
- Plastic containers with the following foods (two pieces per student)
 - Gum drops with sugar crystals on outside (not made with gelatin)
 - Pretzels with lots of salt on outside
 - Bitter, unsweetened chocolate cut into small pieces (be sure to give participants an extra napkin or tissue because they will spit the chocolate out!!)
 - Lemons cut into small pieces
 - Nori sheets cut into small squares (optional-for umami flavour)
 - M & M's (not peanut) or chocolate chips
- Napkins/tissues
- Water and cups (if using disposable, use small Dixie cups)
- Plastic glove or tongs/spoons for distributing food samples
- Garbage can for discarded tissues with spit-out chocolate!

LESSON

Activating Discussion:

- What are your favourite foods?
- Did you ever wonder why your favorite foods taste so good?
 - Our taste buds for let us appreciate the tastes and flavours in food.
- What the difference is between ‘taste’ and ‘flavour’?
 - Taste refers to the five sensations: sweet, salty, sour and bitter; flavor refers to the sensation created by taste, smell and feel of food.
- Taste buds are sensory organs that are found on your tongue and allow you to experience tastes that are sweet, salty, sour, and bitter. How do your taste buds work?
 - Have everyone stick out their tongue so their neighbor can see!
 - Explain that the bumps on the surface of the tongue are papillae (say: puh-PILL-ee), and most of them contain taste buds. Taste buds have very sensitive microscopic hairs called microvilli (say: mye-kro-VILL-eye). Those tiny hairs send messages to the brain about how something tastes, so you know if it's sweet, sour, bitter, salty or umami.
 - The average person has about 10,000 taste buds and they're replaced every 2 weeks or so. But as a person ages, some of those taste cells don't get replaced. An older person may only have 5,000 working taste buds. That's why certain foods may taste stronger to you than they do to adults. Smoking also can reduce the number of taste buds a person has, as can certain medications.

Learning Plan:

1. Provide each participant with a small cup of water, a napkin or tissue, and napkin containing the following TELLING THEM NOT TO TOUCH OR EAT THE FOOD YET:
 - 2 chocolate M & M's
 - 2 gumdrops
 - 2 pretzels
 - 2 small slices of lemon
 - 2 small pieces of bitter, unsweetened chocolate
2. Before you give taste buds all the credit for your favorite flavors, it's important to thank your nose. Olfactory (say: ahl-FAK-tuh-ree) receptors inside the uppermost part of the nose contain special cells that help you smell. They send messages to the brain.
3. Here's how it works: While you're chewing, the food releases chemicals that immediately travel up into your nose. These chemicals trigger the olfactory receptors inside the nose. They work together with your taste buds to create the true flavor of that yummy slice of pizza by telling the brain all about it!
4. Tell participants to close their eyes and plug their nose, and slowly eat ONE M & M/ chocolate chip. Ask them to think about how it tasted.

5. Explain that when you have a cold or allergies, and your nose is stuffy, you might notice that your food doesn't seem to have much flavour. That's because the upper part of your nose isn't clear to receive the chemicals that trigger the olfactory receptors (that inform the brain and create the sensation of flavor).
6. NOW tell participants to close their eyes and, without plugging their nose, eat the other M & M/chocolate chip. Ask if it tasted different; how? Sweeter?
7. Next, have participants try one of each of the other four foods, drinking water in between. Ask them to think about where on their tongue they are sensing the main taste.
8. Now have them eat the remaining foods, in the same order they did previously, thinking again about the tastes and how they are different.
9. Discuss Umami:
 - Umami is a taste described as 'savory, meaty or rich' and is found foods like miso and soy sauce, meat/poultry/fish, legumes, strong cheeses, black olives - even mushrooms and tomatoes. Seaweed is also umami. Some people say it makes you feel 'satisfied' after eating umami foods.
 - Umami comes from an amino acid found in the protein in foods called 'glutamate' (that's why some restaurants put monosodium glutamate in their dishes - to 'boost' this taste!)
 - "Complex" flavours often have several tastes in one food/dish (salted caramel anyone?)
 - FUN FACT: Butterflies have taste buds in their mouths and on their feet!
 - So the next time you chomp on an apple or slurp up some soup, thank your tongue - and your nose! Without them, life wouldn't have any flavour.

Activity Options:

Option 1: Additional food tasting

Instructor brings other foods for students to try and identify the main taste associated with the food. Additionally, the Instructor or students may prepare foods keeping the tastes in mind.

Option 2: In-depth anatomy

Instructor elaborates on the functions and anatomy of the tongue, including roles in chewing, amylase, and digestion. An optional video on the tongue [5:02 min] to watch with students:

<https://kidshealth.org/en/kids/tongue-movie.html?WT.ac=en-k-htbw-main-page-d>

Follow-up Discussion to check for understanding

- What are the five "tastes"?
- Which other foods do you like in each of the taste groups?
- How can having a cold affect your appetite?

Appendices:

- Appendix 1 – Image of the human tongue:
https://commons.wikimedia.org/wiki/File:Human_tongue_taste_papillae.svg
- Appendix 2 (see below) – Flow chart of the five tastes with example foods

