

Open Your Class With This Tomorrow *Gulp*

Background

Introduce the concept of the five primary tastes (sweet, sour, salty, bitter, and umami) with this engaging and interactive demo. Research has shown that the tongue contains receptors cells for each of these tastes located all over the tongue. Explain to students that certain chemicals can alter the functioning of taste buds. For example if you brush your teeth and then drink orange juice the sweet taste of the juice is ruined. Scientists hypothesize that a chemical in toothpaste (sodium laureth sulfate or SLS) which is added to create foam actually temporarily suppresses the sweet receptors located on the tongue and enhance bitter receptors. This demonstration can also be used to highlight the concept of flavor resulting from a combination of taste sensations as well as texture, smell, and appearance. In this demonstration students will be given the opportunity to experience what candy taste likes without the use of their sweet receptors by drinking a tea that temporarily blocks sweet receptors on the tongue. The herb *gymnema sylvestre* which is native to India is known to temporarily block the experience of sweet by preventing sucrose and other sugars from activating the sensory receptors for sweet on the tongue.

Caution

Students with diabetes should not participate in this demonstration.

Demonstration

Prior to class prepare *gymnema sylvestre* tea by steeping $\frac{1}{4}$ cup of the loose tea leaves in boiling water for 15 minutes. You can use a coffee filter to strain the leaves after the tea is finished. You may want to make the tea in the morning and bring it to class in a large thermos. The tea works at any temperature (hot or cold).

1. Explain to students that they will have the opportunity to try a sample of *gymnema sylvestre* tea and then sample a variety of sweet items to experience what taste would be like without sweet receptors. The effects of the tea are reversible and typically last from 15 minutes to one hour. Stress to students that participation is voluntary.
2. Provide each student willing to participate with a small 3 ounce cup of the tea which they should swish the tea in their mouth for 20-30 seconds. It is not necessary that they swallow the tea. The tea itself is bitter.
3. Have students taste the candy samples provided and discuss the taste sensations they experience. Many for example will report that the mint paddies and M&Ms taste chalky. They may still retain the taste of the mint but the candy itself is no longer sweet. Sweet tarts taste especially sour.

Materials

- Candy – a variety of candy types such as sweet tarts, chocolate mint paddies, M&Ms, etc.
- *Gymnema sylvestre* tea which is inexpensive and available through some health food stores or online retailers including the Penn Herb company. (<http://www.pennherb.com/>).
Note: The capsule form does not work well for purposes of this demonstration.

Source

This activity was presented originally by James Kalat, PhD from North Carolina State University at the Institute for High School Psychology Teachers on Biopsychology sponsored by the American Psychological Association (APA) and Teachers of Psychology in Secondary schools at the University of Wisconsin-Green Bay in July, 2007.

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