

Taste Buds Twister

WIN Kids Curriculum for 5th and 6th grade

Designed for classrooms, community youth groups, and other educational settings



Lesson Objectives

- Understand how the tongue distinguishes different flavors in food.
- Evaluate how intensities of taste vary person to person.



Wellness IN (WIN) the Rockies Principles

- Take pleasure in eating.



Health Standards

Content Area - Nutrition and Dietary Behavior

National Health Standards 1 (concepts), 5 (communication) and 7 (advocacy)

Wyoming Health Content and Performance Standards 1, 5 and 7

Montana Health Enhancement Content Standards 1 and 6

Idaho Grade 5 Health Performance Standards 941 and 943

Idaho Grade 6 Health Performance Standards 951 and 953

Note: Suggested standards can be met depending upon lesson components selected and assessed. Potential assessment tools are designated with a ✓.



Approximate Length

- 30 minutes



Materials and Preparation

Handout: Taste Bud Twister (1 per student)

Magnifying glasses and flashlights (1 per 2 students)

Blue food coloring

Cotton swabs (4 per student)

Rubber gloves (1 pair per student)

Face masks or hand-held mirrors (1 per student)

Wax paper

Cups for water (1 per student)

Paper hole punch (1/4")

Measuring cups and spoons (1 per group of 4 to 6 students)

Sugar, salt, Tabasco sauce (be aware of food allergies or health concerns of students)



"He who distinguishes the true savor of his food can never be a glutton; he who does not cannot be otherwise."

-Henry David Thoreau 1817-1862



Background for Educator

We are all somewhat different in how we taste food. Some of us sense the overall flavor of food while others can detect individual flavors from each ingredient. Flavor is the strongest predictor of whether a person likes or dislikes a food, and individuals vary greatly in their preferences.

Preferences result from inter-related factors including genetics, age, ethnic customs, early food experiences, surroundings when trying a new food, and physiological reactions. The number of *fungiform papillae*, the little bumps on the tongue that house taste buds, makes a difference in taste intensity and is determined by heredity. These are distributed most densely at the tip of the tongue. Additional bumps, *filiform papillae*, contain no taste buds.

The tongue can distinguish between salty, bitter, sour and sweet. Much of the sensory input involved with taste is actually olfactory, or through the nose. The combination of taste and olfaction is called flavor.

The tongue map, which shows large regional differences in sensitivity across the human tongue, is highly disputed. Current research indicates all qualities of taste can be sensed from all regions of the tongue containing taste buds. Individual taste buds themselves respond to multiple tastes, but usually one of the tastes (such as salty) is perceived the strongest by a single taste bud.



Lesson Script

Taste Bud Twister Overview

1. We have five senses with which we experience the world: sight, sound, touch, smell and taste. Eating food should be a joy ride for all five of our senses. When we take time to really enjoy our food, we find it more interesting and satisfying.
2. The four primary tastes we sense are salty, sweet, sour and bitter. What foods are salty? What foods are sweet? What foods are sour? What foods are bitter?

Tongue Twister Activity

1. All tongues are not created equal. How strong flavors seem to you is based a lot on the genes you are born with. The tongue has little bumps called *fungiform papillae*, which house taste buds. The more of these bumps you have, the stronger flavors seem to be. We are going to find out how many taste buds you have and how strongly you sense flavors.
2. Wash your hands and get a drink of water to clean your mouth. (*Distribute **Taste Bud Twister** handout and supplies for all tests. Assist students in finding partners.*) You will conduct tests with a partner to complete the **Taste Bud Twister** worksheet. ✓

3. Punch a hole out of a 1½" square of wax paper using a ¼" paper punch. Wearing a face mask, use a cotton swab to paint blue food coloring on the front of your partner's tongue. Place the wax paper square on the tip of the tongue, just to the right of center. *(Alternative: have students use a mirror and do their own tongue.)*

4. Using a magnifying glass and flashlight, count the number of pink, unstained circles (*fungiform papillae*) inside that circle on your partner's tongue. *(Alternative: have students use a mirror and do their own tongue.)* Record number on **Taste Bud Twister** handout. Never shine the flashlight directly into the eyes of another person.

Sweet Sky Rocket

1. This next test determines how your tongue senses sweetness. Mix ¼ cup of sugar in a measuring cup and add enough water to make ½ cup. *(This can be shared among 4 to 6 students.)*

2. Rinse your mouth with water. Using a cotton swab dipped into the solution, coat the front half of your tongue, including the tip. Do not put the swab back in the cup after touching your tongue.

3. Wait a few moments. Rate the sweetness according to the scale on the handout.



We are born
with about
10,000 taste
buds.

Salty Slide

1. The next test rates your sensitivity to salt. Mix 1 teaspoon of salt with ½ cup of water. *(This can be shared among 4 to 6 students.)*

2. Rinse your mouth with water. Using a cotton swab dipped into the solution, coat the front half of your tongue, including the tip. Do not put the swab back in the cup after touching your tongue.

3. Wait a few moments. Rate the saltiness according to the scale on the handout.

Hot Sauce Spinner

1. For the hot sauce test, mix ½ teaspoon of Tabasco sauce in ½ cup of water. *(This can be shared among 4 to 6 students.)*

2. Rinse your mouth with water. Using a cotton swab dipped into the solution, coat the first half-inch of your tongue, including the tip. Do not put the swab back in the cup after touching your tongue.

3. Keep your tongue out of your mouth until the burn is most intense. Rate and record the burn sensation.

➤ **MATH Option:** Assess data interpretation skills. ✓ Individually or in groups, have students develop a pie chart showing number of students who are non-tasters, average tasters and hyper-tasters. Illustrate fractions and percentages visually.



WIN the Home: Dinner Debate

Ask student to share what they learned about the different tastes the tongue can sense at their next family meal. With each food item, have them discuss what they taste (salty, sweet, bitter, and sour). Have them watch for how different people can have different sensations with the same food. Have students prepare an oral or written summary. ✓

Please note: pilot testing of lessons has determined that WIN the Home activities are most successful when students have time over a weekend to complete them, when a follow-up is conducted in class, and when students receive credit for completion.



WIN the Community: Thoreau

➤ LANGUAGE or ENRICHMENT Option: In small groups, have students discuss what the Henry David Thoreau quote (*first page of lesson*) means. Rewrite in modern language. Create posters and display on a bulletin board or wall for others to see. ✓



Sources and Materials

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