SENSES - TASTE
GRADES K-2

BACKGROUND

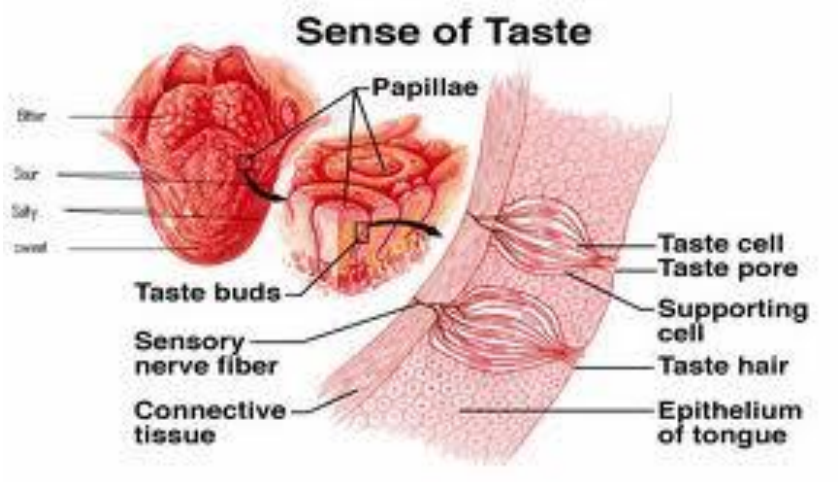
Taste buds are sensory organs that are found on your tongue and allow you to experience tastes that are sweet, salty, sour, and bitter. How exactly do your taste buds work? Well, stick out your tongue and look in the mirror.

Did You Know?

Did you know that butterflies have taste buds in their mouths and on their feet?

See all those bumps? Those are called **papillae** (say: puh-**pih**-lee), and most of them contain taste buds. Taste buds have very sensitive microscopic hairs called microvilli (say: mye-kro-**vih**-lye). Those tiny hairs send messages to the brain about how something tastes, so you know if it's sweet, sour, bitter, or salty.

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.



BASIC LESSON

Objective(s)

Students will be able to… know the four basic tastes of the tongue –sweet, salty, bitter, and sour. Knowledge

State Science Content Standard(s)

Standard 2: Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems. **2.2** Students will be able to examine, measure, describe, compare and classify objects in terms of common physical properties.

Materials

From the Kit

- Cards labeled salty, sweet, bitter, and sour
- 6 sets of containers labeled sugar, salt, baking soda, and lemon juice.
- 12 Hand held mirrors
- Diagram of the tongue
- Taste by M. Rius, J. M. Parramón and J. J. Puig

Provided by Teacher

- Q-Tips
- Sugar
- Salt
- Baking soda
- Lemon juice
- Small paper cups for rinsing their mouth
- Paper cups/small pill dispenser cups for putting the food items in
- Food items that fit into the category of salty, sweet, bitter, and sour. See lesson for suggestions.

Safety

- Awareness of student food allergies or limitations
- Q-Tips are not shared by students
- Students should not be made to taste anything if they are reluctant

Key Vocabulary

- Sweet
- Bitter
- Salty
- Sour
- Tongue
- Taste
- Taste b

Mastery Questions

1. What are the four familiar tastes?
2. What part of the body do we use to taste?
3. What does the sense of taste teach you about the world we live in?
4. How does taste help us select and enjoy food?
5. What would happen to you without the sense of taste?
6. Describe how the sense of taste and the sense of smell are related.

	7. What are some things that should not be taste?

Detailed Plan

Before reading **Taste** to the students, ask them what they think it might be about. After reading the book, have them compare their predictions with the content of the book. Caution students that they need to be careful about what things they taste. Tell the students that in the learning centers they will learn more about taste.

Make a solution of sugar water, salt water, baking soda (add enough water to just barely dissolve the solid), and use pure lemon juice. There are enough labeled cups to have a set of four at 6 stations. Each student should have two Q-tips and instructed to wait for instructions or have a supply of Q-tips at each station.

Introduce the lesson by having students dip one end of a Q-Tip in the solutions of salt, sugar, lemon, and baking soda, one substance after another, and having students taste each. After each student has tasted the liquid, the students describe the flavors. Students clean their tongues after each tasting. (Small glass of water provided rinsing their mouths.) Ask the students to explain what helps them taste the different tastes that were in the solutions. Help them speculate about what happens on the tongue for them to be able to taste. As the students give suggestions, write the relevant ones on a chart.

Talk about taste buds. Show them a diagram of the tongue and have them look at their tongue in a small hand held mirror. Have students act out the face they would make for each taste. (Ex: Sour – a pucker face)

Taste Match Game

Can you put different foods into sweet, bitter, sour or salty groups? Gather up 1-2 different foods that fit into those 4 categories of taste and place them in small unlabeled Dixie cups. If you can't find any "real" food, you can cut out pictures from magazines. Place the items into small paper cups. **Do not label the cups.** Taste one of the items and record whether it tastes sweet, bitter, sour or salty. This can be done as a single station/center or place a setup on each student table.


Materials: Food items suggested

- Salt Taste: Salty water (labeled Ocean Water)/pretzel/cracker
- Sweet Taste: orange juice/candy piece/sugar granules
- Sour Taste: Lemon juice/tart candy/lemon pieces
- Bitter Taste: Onion juice or tonic water/unsweetened cocoa or chocolate/coffee

 Q-Tips – dip and place lightly on tongue

- Pencil and paper to record the results. (Data Table provided separately on the ExplorationWorks Website.)

Taste Data Table	Sweet	Sour	Bitter	Salty
Draw or write the names of the food in the box where they belong				
Suggest an item you know that fits into this column				

Please clean and dry the containers after your class is done.

Assessment

- Why is taste important?
- Do you think it is a good idea to taste something that is not familiar to you to find out what it is? Why? Yes, it could be something that is not good to eat. Some things look good, but **can be very dangerous.** If we are offered food we don't know about (for example, when we go trick-or-treating during Halloween) or we want to find out what kind of food something is, we should not taste it. We should ask a parent or relative if it is safe to taste it.
- See Mastery questions, also, for assessment.

Resources

Paseo Partners: Integrating Mathematics, Science, and Language (http://www.sedl.org/scimath/pasopartners

ADVANCED LESSON

Objective(s)

1. Students will be able to differentiate between the four basic tastes of the tongue. *Analysis*
2. Students will be able to record their favorite likes, dislikes, and favorite foods and create a graph. *Synthesis.*
3. Students will use the graph to compare the tastes of the class. *Evaluation.*

State Science Content Standard(s)

Standard 2: Students, through the inquiry process, demonstrate knowledge of properties, forms, changes and interactions of physical and chemical systems. **2.2** Students will be able to examine, measure, describe, compare and classify objects in terms of common physical properties.

<table>
<tr><th colspan="2">Materials</th><th>Safety</th></tr>
<tr><th>From the Kit</th><th>Provided by Teacher</th><td rowspan="2">• See Basic lesson</td></tr>
<tr><td>• Picture cards of food items – laminated
  ○ dill pickle
  ○ Lemon
  ○ Unsweetened cocoa
  ○ orange
  ○ potato chip
  ○ pretzel
  ○ jellybean
  ○ mint candy
• Word cards – salty, bitter, sour, sweet</td><td>• Construction paper cut into small pieces
• Containers to hold food items – Small dixie/plastic cups numbered 1-8 (as many sets as needed in classroom)
• Food items
  ○ dill pickle
  ○ lemon
  ○ Unsweetened cocoa
  ○ orange
  ○ potato chip
  ○ pretzel
  ○ jellybean
  ○ mint candy
• Pencils/Crayons
• Thumbtacks or tape</td></tr>
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<tr><td colspan="2">• Sweet
• Bitter
• Salty
• Sour
• Tongue
• Taste
• Taste buds</td><td>• See Basic lesson</td></tr>
<tr><th colspan="3">Detailed Plan</th></tr>
<tr><td colspan="3"><u>Sense of Taste and The Tongue</u>

This lesson will work better if taught as a center with four students per center.

<u>Materials</u>:

• 24 copies of the taste worksheet (provided on ExplorationWorks Website)
• Six sets or however many tasting stations work for your classroom of containers numbered (1-8) with slices or pieces of each item (enough for 4-5 students):
  ○ dill pickle
  ○ lemon
  ○ bitter chocolate/unsweetened cocoa
  ○ orange
  ○ potato chip
  ○ pretzel
  ○ jellybean
  ○ mint candy (small pieces)</td></tr>
</table>

- 96 small pieces of construction paper for students to write their name on for the graph (four cards per each student)
- Picture cards for bulletin board of all of the foods tasted, including the word cards sour, salty, bitter and sweet
- Pencils
- Crayons
- Thumbtacks or tape

Procedures:

Part I: The Taste Test

1. Prepare the food by making slices and putting them into containers. Number the containers one through eight. Put out in the order of the worksheet.
2. Tell students that they will be trying different foods that have very different and noticeable tastes.
3. Have the students taste the food in container one and record on the worksheet their reaction by coloring the happy face if they like it, or the sad face if they don't like it. Also, is it sweet, sour, bitter, or salty? Then the students taste the food in container two and record their reaction.
4. The students continue taste testing and recording the rest of the foods in order.
5. Next, have the students choose his /her four favorite tastes and write an "X" by it in the "My Favorites" column on their worksheet.

Part II: The Graph

1. Prepare the bulletin/white board for the graph using food picture cards with the name of all the foods they tasted. Place them along the bottom of the board. Have cards with sour, salty, bitter and sweet posted close by the foods that match the appropriate category. (Above the word Salt, the picture of the pretzel and potato chip will be posted and above sweet, the jelly bean and mint candy will be posted and so on.)
2. Give the students four pieces of small construction paper and tell them to write their names on the paper.
3. Tell the students to tack or tape (depending if you are putting the graph on a bulletin board or on the chalkboard) his/her cards above their favorite choice in each of the four basic taste groups.
4. After all of the students have finished the graph, ask students to make comparisons. What taste group has the most names by it? Why do you think this? What taste group has the least? Any other comparisons that the students can come up with.

Assessment

Evaluation of student learning:

1. Were the students able to help create the graph? Were different types of graphs suggested?
2. Did the students evaluate the graph and make good comparisons?

Resources
• **http://education.illinois.edu/YLP/97-98/97-98_units/97-98mini-unit/MCurtiss_FiveSenses**

EXPLORE MORE

 The students cut out pictures of foods and glue on appropriate labels.
 Provide students pictures of many different foods. Students sort the pictures in as many ways as possible related to tastes. Provide pictures of things that **should** and **should not** be tasted.

Does sight influence taste?

Tasty Visions

Materials

- Flavored jelly beans
- Dixie cup or napkins

For each subject you test, you will need pairs of jelly beans. For example, get 2 cherry jelly beans, 2 lime jelly beans, 2 lemon jelly beans and 2 orange jelly beans. Each jelly bean flavor has its own unique color: red for cherry, green for lime, yellow for lemon and orange for orange. Divide the jelly beans into two groups: each group should have one of each flavor.

Label small containers (Dixie cup) or napkins with the numbers 1 through 4. Place the jelly beans from the first group into a container or on a napkin - one jelly bean into each container or on each napkin. Wrap the jelly beans in the second group in foil or place them in a cup so that your subjects cannot see them. Label these cups with the numbers 5 through 8. Make sure that the flavors of the second group have different places than the flavors in the first group.

Now you are ready to start the experiment. If you want, you can tell your subject the names of the flavors that they will be tested. In other words, you can say, "The jelly beans you taste will be either cherry, orange, lime or lemon." Tell your subject to look at the jelly bean in container #1 of the first group and then taste the jelly bean. After they have tasted the jelly bean, tell your subject to write down its flavor. Do the same thing with jelly beans #2-4.

The next part of the experiment is a bit more difficult. You must keep the color of the jelly beans in group 2 hidden from your subjects. You can blindfold your subjects or have them close their eyes while they taste the jelly beans. Keep track of the flavors that your subjects say

each jelly bean tastes like. You can even tell your subjects that the flavors they will taste will be the same as before.

Discuss discrepancies in taste when prompted by an incorrect color.

Is it easier to determine the flavor if you see the color? Does color influence food?

You can also have the students plug their noses and close their eyes to see if sight and smell influence taste. You have a sugar sensation but no taste. After they chew for about 20 seconds I tell them to let go of their nose and they get a blast of flavor. We then discuss the role of our nose with taste.