

# Testing Taste

## FRAMEWORK

I. Scientific and Engineering Practices 1,3,4,6,7,8

II. Cross-Cutting Concepts

III. Physical Sciences

## SKILLS/OBJECTIVES

- In this activity, we will do two experiments involving taste and collect data in order to make conclusions about how we taste. It's designed to teach kids a little bit about the scientific method.

## MATERIALS

- Blue food coloring
- Q-Tips
- Magnifying Glasses (1 per kid)
- Mirrors
- Small pieces of paper with one hole punched into them
- Blindfolds
- Different jellybeans with distinct flavors (Or another candy)
- Big graph paper on which to make a graph of data
- List of possible jelly bean flavors
- Cups
- Lemon Juice (sour)
- Sugar Water (sweet)
- Salty water (salty)
- Antacid Tablet water (bitter)

## BACKGROUND

- Begin by asking kids how we taste. If they bring up the tongue, ask them what on the tongue allows us to taste. Tell them we have bumps on the tongue called **taste buds** send messages to our brains allowing us to taste.
- Ask if anyone is a picky eater. People who don't like to eat a lot of foods may actually have more **taste buds** than other people. This makes their food taste stronger, meaning if there is a bad taste in the food, it will taste worst to these people. These people are called "super tasters". There are also some people who have fewer taste buds than most, and these people don't taste their food as well.

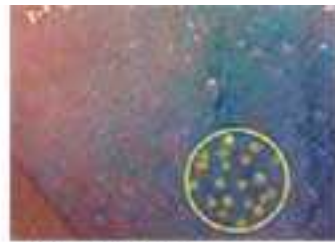
Activity #	Taste Buds
Materials	<ul style="list-style-type: none"> <li>• Blue food coloring</li> <li>• Q-Tips</li> <li>• Magnifying Glasses (1 per kid)</li> <li>• Mirrors</li> <li>• Small pieces of paper with one hole punched into them</li> <li>• Blindfolds</li> <li>• Different jellybeans with distinct flavors (Or another candy)</li> <li>• Big graph paper on which to make a graph of data</li> <li>• List of possible jelly bean flavors</li> </ul>
Worksheet	Y

- **Divide into pairs and put blue dye on the tip of the tongue of one partner using a Q-tip.** This should make the taste buds stand out. If some people are uncomfortable with working with a partner, they can do the activity using a mirror, counting their own taste buds.
- Place the piece of paper with the hole punch over one area of the tip of the tongue.
- Have the other partner use a magnifying glass and toothpick to count the number of taste buds inside the hole. Record this on the worksheet. Repeat from step one with the other partner. (Or have each kid do it by themselves in a mirror). FOR YOUNGERS: you may have to help them. You can either count their taste buds or if they won't stay still, estimate which category they fall into using the picture at the end.
- **Ask kids if they've ever had trouble tasting when they had a stuffy nose.** Explain that when we taste things our brain combines both the taste and the smell and the texture to identify the flavor of the food.
- **Tell the kids that in our experiment,** we are wondering whether "super-tasters" because they have a stronger sense of taste, might also be better at identifying flavors. Also tell them that losing smell makes it hard for everyone to identify flavors, but we want to see if this is true for super-tasters, too. Explain what a hypothesis is.
- Have them fill out the hypothesis section of the worksheet. Poll them, asking them to raise their hands if they think people with more taste buds will be better able to guess jelly bean flavors.
- Have the kids look at the list of possible flavors of jellybeans. Blindfold one partner. The other partner should feed the blindfolded one jellybeans and ask her to guess the flavor. Record the flavor and whether they were right or wrong on the worksheet.
- Now have the blindfolded partner hold his nose and try repeat step 3. Repeat from step 3 with the other partner.

- SKIP THIS FOR YOUNGERS. When they're done collecting data, have them go up to the board and record their data on the graph (# of taste buds vs. # of "right" guesses). This is probably something that we will have to help them with, so someone should be standing at the graph to facilitate.
- Discuss the results with them. Does it seem like people with more tasted buds identify tastes better? Ask them if their hypotheses were right or wrong. If they really seem to be understanding it well, you could ask them why their hypothesis is right or wrong. FOR YOUNGERS: Ask them questions to figure out their results. How many people were supertasters? nontasters? How many people guessed them all right? How many people guessed 4 right? Say, "so it seems like people with more taste buds guess better/it makes no difference." (Basically figure out what their data shows and tell them). Poll them to see if they guessed right at the beginning.



Tongue of a non-taster..



...normal taster...



...supertaster

**Question:** Are people with more taste buds better at identifying flavors?

**Hypothesis:** I think people with more taste buds will be (circle one) better/worse/the same at identifying flavors than people with fewer taste buds.

*Number of taste buds in the circle: Non-taster = <15 taste buds; Average taster = 15-35 taste buds; Super-taster = >35 taste buds*

I have \_\_\_\_\_ taste buds. I am a (circle one) super taster/average taster/nontaster.

My partner has \_\_\_\_\_ taste buds.

### Jelly Bean Challenge

With smell (nose unplugged)		No smell (nose plugged)	
Flavor	My partner guessed... (circle one)	Flavor	My partner guessed... (circle one)
	right or wrong		right or wrong
	right or wrong		right or wrong
	right or wrong		right or wrong
	right or wrong		right or wrong
	right or wrong		right or wrong
	# of "rights":		# of "rights":

**Conclusion:** The class data shows that people with more taste buds are (circle one) better/worse/the same at identifying flavors than people with fewer taste buds.

This (circle one) supports/goes against my hypothesis.

## BACKGROUND

- Ask what the four tastes are. Tell them if they don't know them all (sour, sweet, salty, and bitter).
- Show them the traditional taste-mapping diagram of the tongue and explain that the tongue has different kinds of taste buds to detect the different kinds of tastes.
- Many scientists don't believe that this taste diagram is true, we want to find out whether or not they're right.

**Note:** Don't leave the taste diagram up while doing the experiment; it might alter their results.

Activity #	Where do we taste
Materials	<ul style="list-style-type: none"><li>• Q-Tups</li><li>• Cups</li><li>• Lemon Juice (sour)</li><li>• Sugar Water (sweet)</li><li>• Salty water (salty)</li><li>• Antacid Tablet water (bitter)</li></ul>
Worksheet	N

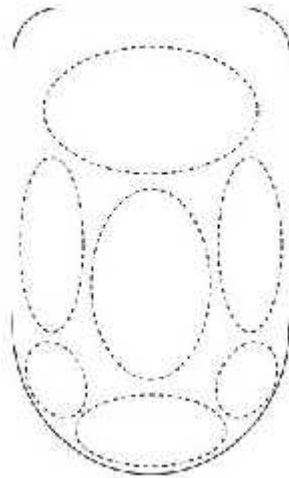
- Divide into partners. Have one partner be the taster and one be the experimenter. Again, if some kids want to work alone, they can use a mirror.
- The experimenter dips the Q-tip into one of the flavors and touches it gently to different parts of the tongue of the taster. After each spot the taster should say if they taste it or not (if they're really understanding it well/not youngers you can do if they taste it "not at all," "a little," or "a lot.")
- The experimenter should record where the taster tastes each taste on her tongue diagram.
- After they are done collecting data, discuss whether the scientists who made the taste diagram are right. (Show them the taste diagram again. They should find that it's wrong). Ask them if anyone tasted anything in a different area than what's on the diagram.

## Traditional Taste Map

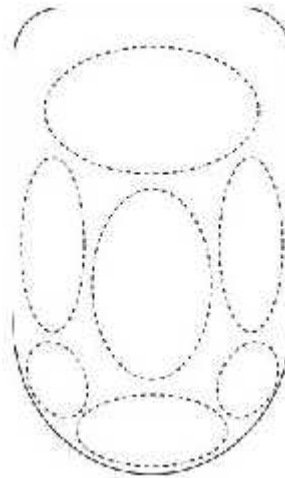


**Finding Tastes:** Try each taste in each part of the tongue.  
Mark X in that place if your partner *doesn't taste it at all*; mark  
✓ if your partner *tastes it*.

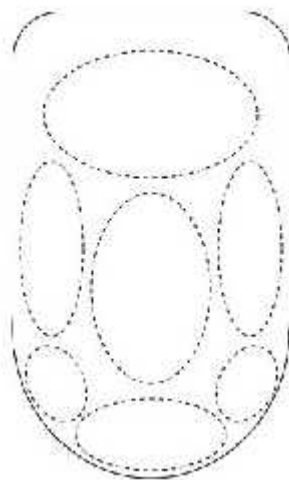
**Sweet**



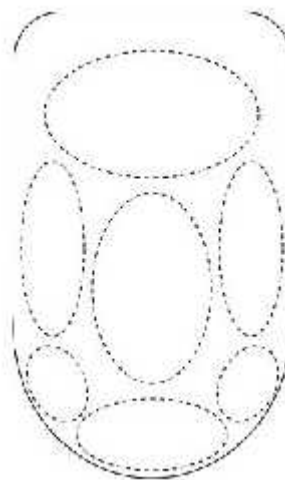
**Sour**



**Bitter**



**Salty**



Is the traditional taste map correct? (circle one) YES/NO

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## **CONCLUSIONS**

Talk about the scientific method of creating and testing a hypothesis.  
Discuss the different ways we interpret and look at our data and what we learned from our experiments today.

Discuss the results from the jelly bean experiment and the taste location experiment, what we found and what it tells us about the tongue and our sense of taste.