

## EXPLORATION OF TASTE

### Learning Objectives

Students will be able to:

- Determine the lowest concentration of a substance dissolved in water which can still be tasted. Substances used are sugar, salt, and vinegar

### Standard (s)

NGSS: 5-PS1-3. Make observations and measurements to identify materials based on their properties.

### Background

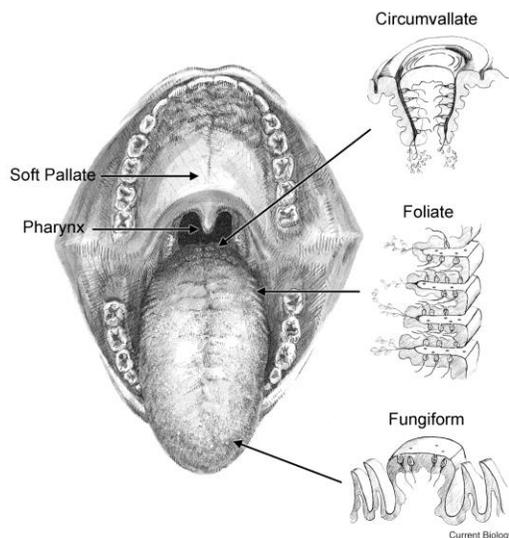
All These Senses Are Important?

- A. Tongue
- B. Touch
- C. Sight
- D. Smell

The mouth tastes 5 things:

- Sweet
- Salty
- Sour
- Bitter
- Umami

Human Taste Field:



The Tongue:

Our sensory system for taste, or our **taste perception**, is remarkably sensitive.

Each taste bud is made up of about 50 to 150 *taste receptor cells*.

### **Material Used for the Experiment**

Salt (Sodium Chloride)

Table sugar (Sucrose)

Vinegar

Water (preferably distilled)

Stirring rod or spoon

Gram balance

250 mL beakers or metric measuring cup

100 mL graduated cylinder

10 mL graduated cylinder or eye dropper

cotton swabs

paper cups

paper towels

### **Experimental Procedure**

1. With the 100 mL graduated cylinder, measure out 90 mL of water and pour it into a clean beaker. Add 10 g of sugar. Stir to mix well. This will give you a 10% sugar solution.
2. Rinse your mouth with plain water and wipe your tongue dry with a clean paper towel.
3. Dip a clean cotton swab into the 10% sugar solution and smear it all around your tongue. If you can taste the sweetness, put a + in the data table for 10% sugar (sweet).
4. Measure out 10 mL of the 10% sugar solution and pour it into another beaker. Add 90 mL of water and stir. This will give you a 1% sugar solution.
5. Again rinse your mouth and wipe your tongue dry.
6. Dip a clean cotton swab into the 1% sugar solution and smear around your tongue. Again record in the data chart whether you can (+) or cannot (-) taste the sweetness.
7. Keep on doing the experiment with 0.1%, 0.01% and 0.001% solutions. Record the results in the chart. The lowest concentration at which you can still taste the sweetness is your approximate taste threshold.
8. Repeat the experiment with salt (salty) and vinegar (sour). To make a 10% solution of vinegar, use 2 mL of vinegar and 18 mL of water.

### Concentration Data Tables

CONCENTRATION	SWEET	TASTE / Yes	TASTE / No
10%			
1%			
0.1%			
0.01%			
0.001%			

CONCENTRATION	SWEET	TASTE / Yes	TASTE / No
10%			
1%			
0.1%			
0.01%			
0.001%			

CONCENTRATION	SWEET	TASTE / Yes	TASTE / No
10%			
1%			
0.1%			
0.01%			

0.001%			
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**Assessment Questions**

1. What is your taste threshold for sweet? salty? sour?

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2. Were your thresholds for all three flavors the same? Why or why not?

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3. What factors might account for differences in taste thresholds between people?

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4. Will your taste thresholds be more likely to be higher or lower when you are fifty years old? Why?

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5. Why do small children often resist foods which are spicy or strong- flavored?

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Supporting Program: Center for Pre-College Programs, at the New Jersey Institute of Technology  
Contributors

Thomas Weiner, New Brunswick School District - Adult Learning Center, New Brunswick, NJ,  
Primary Author

Howard Kimmel, Levelle Burr-Alexander, John Carpinelli - Center for pre-College Programs, NJIT.  
Dr. M. Azad, Dr. B. Patel, Dr. Rajesh Dave - C-SOPS, NJIT