

Exploring Gustation (Taste)

“What will I have for lunch? Let’s see. You know what, my taste buds are screaming for a large order of French fries, a double bacon cheeseburger with extra cheese, lettuce, tomato, and onions. Oh yeah. Hold the mayo, please. I’m watching my weight.”

Americans are big eaters. If someone asks you what’s your favorite food, just thinking about it almost allows you to taste it. Your tongue is equipped with special receptor cells called **taste buds**. These taste buds allow you to tell differences in four separate tastes:

- **Salty**
- **Sour**
- **Bitter**
- **Sweet**

Let’s do some experimenting with our **sense of taste or gustation**.

(NOTE: You will be asked to taste certain liquids. You should follow directions carefully. Please just taste the items. This is not a restaurant!)

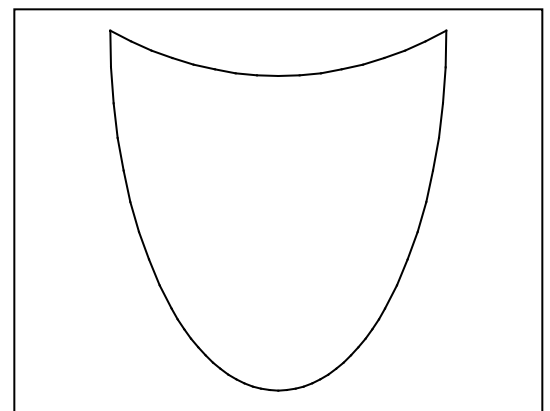
Materials

- Colored pencils, markers or crayons
- Cotton swabs
- Paper cups
- Solutions: **Salty** (Salt water), **Sweet** (Sugar water), **Sour** (Lemon juice), **Bitter** (Tonic water)
- Tongue map

Procedures

- Label one cup **salty**, one cup **sweet**, one cup **sour**, and one cup **bitter**.
- Pour a small amount of each fluid into the correct cup.
- Place the tip of one cotton swab into the **salty** solution and touch the swab to these four areas of you tongue: Tip, Sides, Center, Back (*Caution: Don’t go too far back or you’ll make yourself gag.*)
- Determine which part of your tongue tastes **salty** better.
- Color in on **Figure 1** where you taste **salty** the most and make a **KEY** like on a map to show which color represents **salty**. (*Note you may taste it equally well on more than one area. If this happens, color both areas.*) **Figure 1 Tongue Map**
- Discard the used cotton swab.
- Repeat the procedures for **sweet**, **sour**, and **bitter**.

Create your KEY here

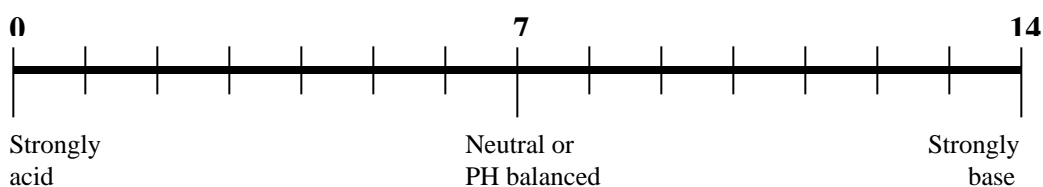


PH and Gustation

“Strong enough for a *man*, but pH-balanced for a *woman*.”

You’ve heard this on commercials and probably wondered what it meant. The term “**pH**” refers to a way of measuring the amount of **acid** or **base** found in a liquid. The commercial didn’t let you know that all substances that go on or in your body whether you’re male or female are tested first to determine their pH. The government requires that the substance be tested because too much acid or too much base can do serious damage to your body. We can use the **pH scale** to find the pH of a substance.

The **pH scale** goes from 0 to 14. A substance with a pH anywhere on the scale from **0 – 6 has acid** in it. Any substance with a pH anywhere on the scale from **8 – 14 has base** in it. A substance with a pH of **7 is neutral or pH-balanced**. The pH scale is shown below:



Let’s test some everyday items for their pH.

Note: Only PART 1 of this experiment involves the sense of taste. Please only taste the substances. Do not attempt to make a meal out of these substances..oink,oink.

PART 1

Materials

- Colored pencils, markers or crayons
- Cotton swabs
- Paper cups
- Food items
 - Lemon juice
 - Lime juice
 - Grape juice
 - Vinegar
 - Tonic water
 - Soft drink
 - Antacid
 - Apple juice
 - Salt water
 - Milk
 - Seltzer water
 - Tomato juice
 - Grapefruit juice
 - Water
 - Baking soda solution
- ColorpHast pH indicator strips

Procedures

- Pour small amount of each substance into separate cups.
- Use one cotton swab for each substance to determine if each substance is **salty**, **sweet**, **sour**, or **bitter**. Discard the swab after each test of each food.
- Complete **Data Table 1**.
- Complete the hypothesis section of **Data Table 2**.
- Use colorpHast strips to determine the pH of each substance. Dip the colored part of one strip into one substance and leave for about 1 minute. **Use a new strip for**

Challenge Activities

1. Which substances were the most **acidic** (had the most acid)?

2. Which substances were the most **basic** (had the most base)?

3. What do you think would happen to the pH if you poured some of the strongest acid into the cup with the strongest base? _____

Try it. When you tested the pH using a new strip, what was the pH? _____

4. Try some more experimenting like you did in number 3. Use the space below to explain what you did and what you discovered.

5. If you have time and a computer with online capabilities, check out these websites:

<http://www.miamisci.org/ph/>

<http://www.sirius.com/~johnkyrk/pH.html>

<http://parkhs.racine.k12.wi.us/Root2k/pH.html>

<http://ga.water.usgs.gov/edu/dictionary.html>