

The Genetics of Taste



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Glenridge Elementary School - Third Grade

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Introduction

Problem/Question:

How does changing the gender of our test subject affect the way we taste bitter foods?

Background Information:

Why we chose the topic:

We did this project after we talked to our mentor and settled on an idea that was really interesting to us. Our mentor, Sarah, is very knowledgeable about the topic and can help us throughout the entire process. At first, we thought that our independent variable would be changing the DNA. But that is impossible for us to test it since we don't have the special lab equipment to perform it. Therefore we decided on the independent variable being the gender of the test subject.

What I learned about this topic:

Definition of Taste:

Taste is one of the five senses. The organ that lets you taste is a muscle called the tongue, tongue tastes sour, sweet, bitter, salty, spicy and plain. The different tastes come from cells called taste buds on the upper surface of tongue. The taste buds attract the food you eat and transfers the taste signals to the brain and tell you whether it is sweet, salty, spicy, bitter or plain. so the tongue and taste buds basically lets people taste and gives you a taste sensation so you can taste otherwise everything would taste like water or ice, so thank your tongue for being there. (You know what would happen if you didn't have a tongue:

1. No taste
2. No proper talking

Taste is inherited from your parents. People have different taste so we might not be able to taste the bitter paper the same.

Where I found the information:

Google Scholar Websites for more info NCBI articles 3rd-grade info
purchase some PTC paper!4.99!

<https://geneplanet.com/blog/can-everyone-taste-bitter-foods/>

Glenridge mentor club

<https://learn.genetics.utah.edu/content/basics/ptc/>

Our high school mentor in Glenridge Science Fair Mentor Club gave us an idea of how a person's gender can change the way he/she tastes the different food.

Hypothesis/Variables

Different people taste food in the different ways.

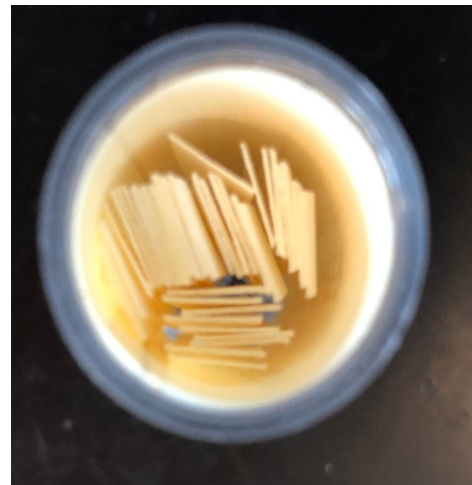
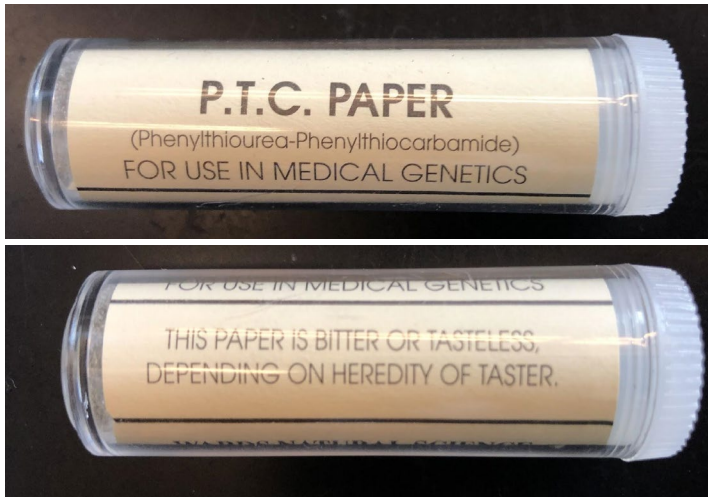
We predict that subjects of different genders might sense the bitter taste differently because males and females have different DNA or genes.

Variables:

Name	Type
Gender	Independent
Taste sense (gustatory sense)	Dependent
PTC paper strips	Constant

Method

Materials: PTC test strips, plain control strips, water, candy



PTC (Phenylthiocarbamide) is a safe, FDA-approved chemical used for genetic variations. Stores like Walmart and Amazon sell it. The control strips are plain paper with no PTC added. Test strips have PTC that some people sense very bitter, some sense bitter and some sense tasteless.

Safety: PTC is approved by FDA and has no hazards.

We sent consent forms (Appendix 1) to students' homes and asked parents consent for the students (subjects) taste the test and control paper strips.

Execution

How we did the experiment:

Study people: We looked up the other studies with PTC paper strips and found out others have tested between 20 and 50 people, so we planned to test 20 people (male and female). This number was more realistic for us.

At first, we made a subject data chart (Appendix 2). Then we wrote down the name and gender of each student whose parent consented.

Phase 1:

- We gave a control strip to the subject and asked him/her keep it in mouth for 10 seconds
- Then asked how it tasted and check marked the answer in the chart

Phase 2:

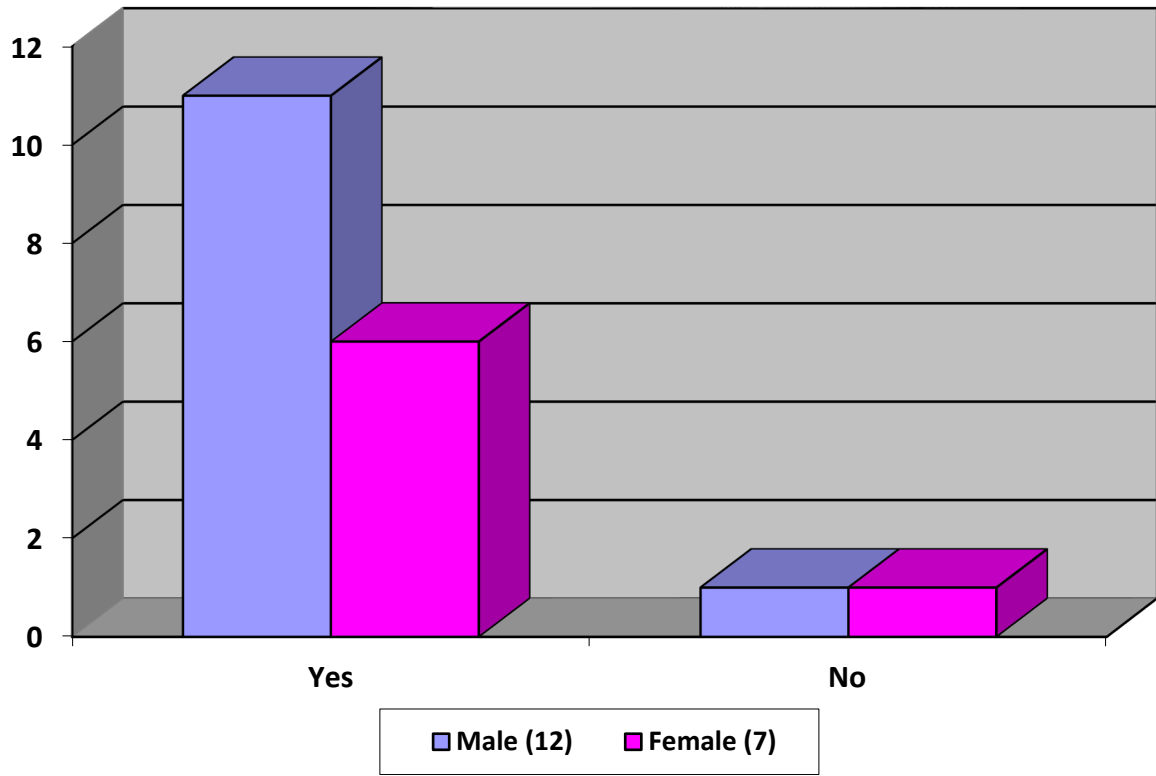
- We changed the PTC strip variable and gave a test strip to the same subject and asked keep it in mouth for 10 seconds again
- Then asked how it tasted and check marked the answer in the chart

Phase 3:

- We changed the taste variable again and gave a candy to the same subject and asked how it tasted
- So we could test if sweet taste was different too
- Also we could wash the bitter taste that felt bad in subjects' mouth

Results

Number	Gender	Can Taste Bitterness	Observations/Reaction
1	Male	Yes	Extremely bitter, strong reaction
2	Male	Yes	Extremely bitter, strong reaction
3	Female	Yes	Extremely bitter
4	Female	Yes	Extremely bitter
5	Female	Yes	Very bitter
6	Male	Yes	Extremely bitter
7	Female	No	Did not sense anything (maybe a little bitter)
8	Male	Yes	Very bitter
9	Male	Yes	Extremely bitter, super bad taste
10	Male	Yes	Very bitter
11	Male	Yes	Extremely bitter
12	Female	Yes	Very bitter
13	Male	Yes	Somewhat bitter, tolerable
14	Male	Yes	Extremely bitter
15	Male	No	No taste
16	Female	Yes	“Spicy”, bad taste
17	Female	Yes	Definitely bitter
18	Male	Yes	Definitely bitter
19	Male	Yes	A little bitter



CONCLUSION

Six of 7 females and eleven of 12 male subjects could sense the bitter taste. Gender does not affect if someone can taste bitter compounds.



Thank you for reading this project!

Credits

Max Shuang (Researcher)

Orod Alipour Hamidian (Researcher)

Sarah Taylor (Our Mentor that gave us this idea)

Brendan Kearney (Our Science teacher who put this project into action)

Gregg Thompson (Our teacher who supported the test with our classmates)

All participants who supported our test

Our parents who provided the materials



Our Mascot: Sciencnow/snowy

Glenridge Elementary School

7447 Wellington Way

Science Lab

Fully Completed On

4/4/2020 Wednesday, April 3:08 PM 21 Sec

Worldwide Science Fair Project

Appendix A – Consent Form

Consent Form

Orod and Max, 3rd grade students at Glenridge, are doing a safe scientific experiment that will be presented in the upcoming St. Louis Science Fair in April 2020.

They ask volunteer students to taste control and test paper strips. Control strips are plain paper, where test strips are saturated with PTC (Phenylthiocarbamide), which is a safe, FDA-approved chemical used for genetic variations for long time and is available from public vendors (e.g. Walmart, Amazon). This classic test has already been done with exceeding safety in numerous family parties, school experiments and academic settings with no allergic reactions.

Your child is asked if (s)he volunteers for such taster's test, however, your consent is required before a test. The all participating students' names will be removed and the results will be shown as anonymous solid numbers.

I..... consent my
child(ren) volunteer for this taste experiment.

Signature

Date:

Appendix B – Data Chart

Date:

Taste experiment

Name			Test 1 (Control strip)		Test 2 (Test strip)		Test 3 (Sweet test)	
	Boy	Girl	Bitter	No taste	Bitter	No taste	Sweet	No taste
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								