How does vision affect perception of taste?
-a continuation project-

Question:

How does vision affect perception of taste?

<u>Reason behind my question:</u>

The original reason behind my project was that I was eating green popsicles with my friend and we both thought it was different flavors. We decided it was green apple because of the color. This made me wonder how much the color we see affects what we think something tastes like.

This is a continuation project, so my results from last year gave me a new reason to continue testing my question. Last year, I found that vision DID affect perception of taste when first graders were asked to test clear popsicles. This made me want to continue the project with a new experiment setup where I test the same question again, but with incorrectly colored popsicles instead of clear.

Research

I read about how taste works. I found out that taste happens mostly in your mouth. It happens on your tongue. Your tongue has taste buds that send messages to your brain about what you are eating based on the taste.

In the original experiment last year, I hypothesized that kids did not need vision to taste flavors correctly because they would rely on the taste buds that I learned about in my research. I predicted that kids would identify the flavors of both colored popsicles and uncolored popsicles equally as well. Kids mostly guessed the colored popsicles correctly, but only about 1/3 of the kids guessed the uncolored popsicles correctly. This means that perception of taste was affected by vision in my original experiment and the tested kids relied on visual cues to figure out the flavor of a popsicle.

Hypothesis

Based on my results from my project last year, that vision affects perception of taste, I predict that the first graders I am testing will have near perfect scores for guessing the flavors of the colored popsicles, and they will not be able to identify the correct flavor of the incorrectly colored popsicles. They will report flavors based on the color they see and not based on the flavor they taste.

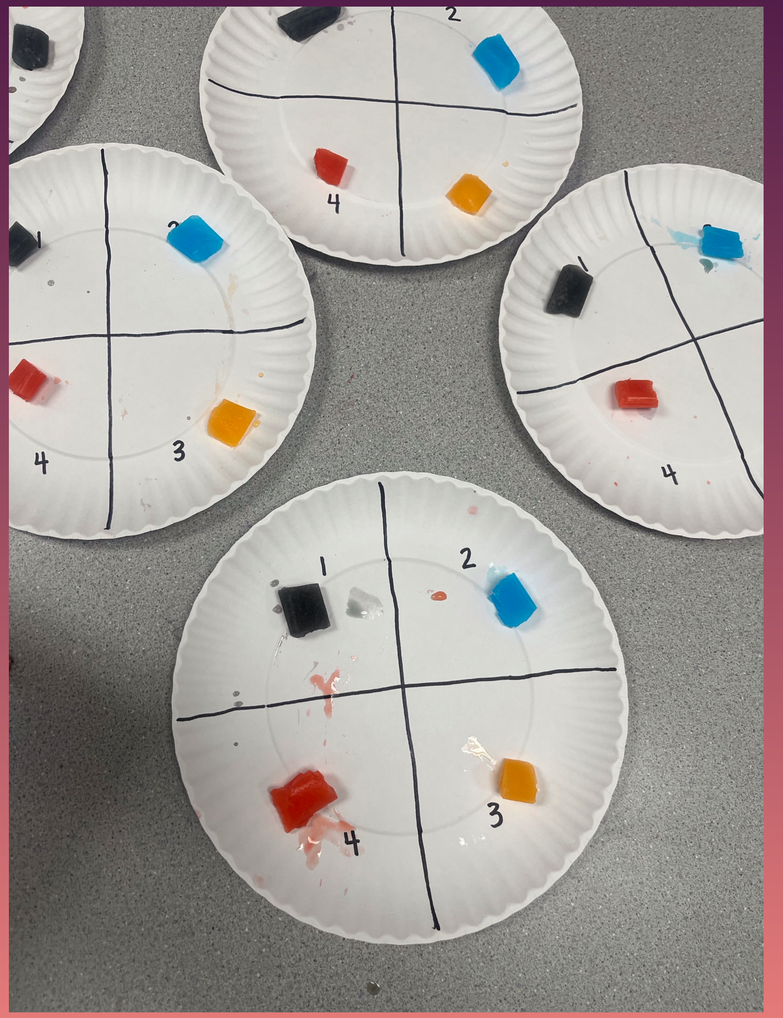
Hypothesis: Vision DOES affect perception of taste.

Steps

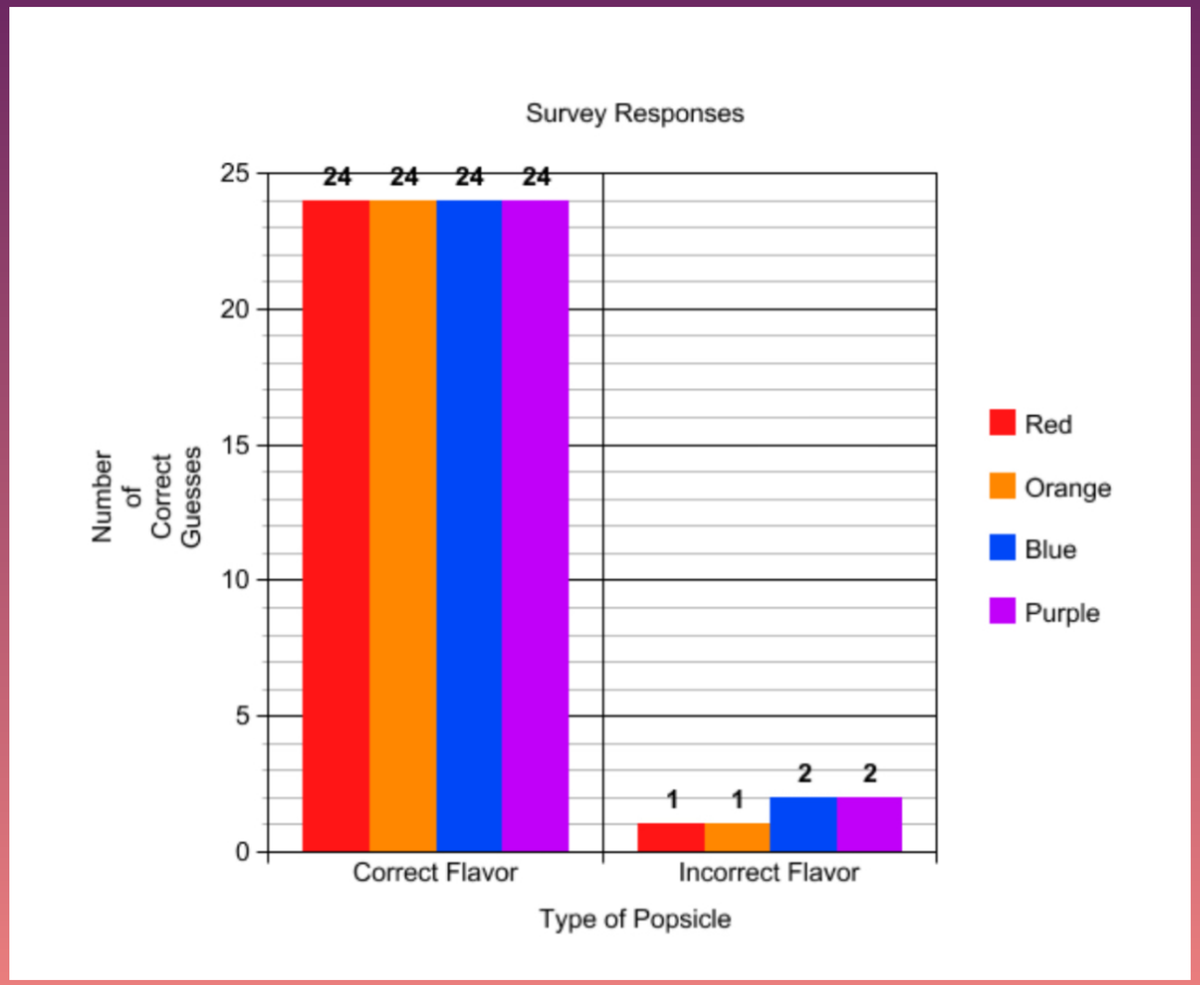
- I set my controls and variable first. My control was the regular popsicle with colors that matched their flavor. My variable was the incorrectly colored popsicles where the color did NOT match the expected flavor.
- For it to be a controlled experiment, I chose the same brand and type of popsicle that comes in colored and non colored. The company says that the same flavorings and ingredients are used in both type of popsicle. The only difference is the company adds artificial dye to the colored variety. I am using similar artificial dye to color match to the colored popsicles in order to make the clear ones the “wrong” color. I also made sure that every student got the same popsicles in the same order at the same time. I did not do the wrong colored popsicle plates in the same order as the colored plates so students did not just guess the same order. I also made sure that the survey I created for the students gave choices based on the already known flavors from the company. I did this to narrow answers because the teacher of the class said that 6-year-olds might spend a lot of time writing completely other things if it was a fill-in answer.
- I did not announce to the students that they were being given popsicles that might be incorrectly colored. I didn’t want to sway results and have them guess different flavors just because they were expecting to.
- For safety of students, I picked popsicles with no allergens. I also had parents sign consent forms. Students were allowed to choose not to do the taste test, but they all wanted to do it.

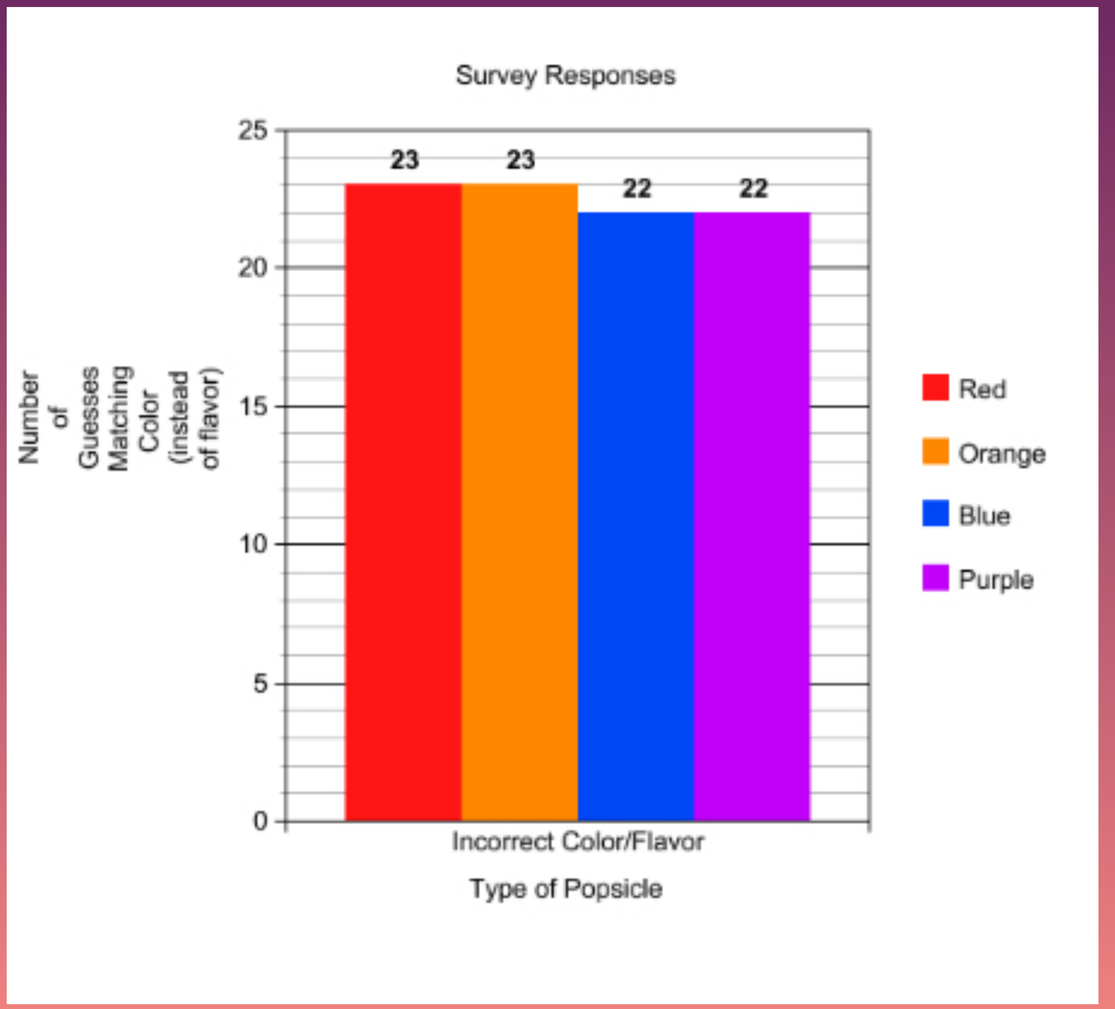
Steps Continued

- 1. I made the plates for the taste test. I made 24 plates with colored popsicles and 24 plates with wrong colored popsicles. The popsicles were taken out of the wrapper and cut up into bite pieces. I wrote numbers on the plates to match the experiment trials. Each plate had to be set up the same with the same flavors for the same numbers.
- 2. I put up testing folders and told students they can’t talk, look around, or anything. I didn’t want a kid saying an answer and affecting what other kids thought the answer was.
- 3. I gave each kid the colored popsicles plate and the survey.
- 4. I led the experiment using a document camera. I asked kids to stay with me and go question by question. I asked kids to eat the first numbered popsicle, then I read their answer choices, and then had them pick their answer. All 24 kids followed the directions and did what I told them.
- *I followed the steps in number 4 for each of the 4 colored popsicles, then switched to the plate of wrong colored and did it all again.



Results In Pictures





Results In My Words

Correct Colored Popsicle 1 (red/cherry)- 24/24 kids guessed correctly.

Correct Colored Popsicle 2 (orange/orange)- 24/24 kids guessed correctly.

Correct Colored Popsicle 3 (blue/raspberry)- 24/24 kids guessed correctly.

Correct Colored Popsicle 4 (purple/grape)- 24/24 kids guessed correctly.

Wrong Colored Popsicle 1 (red/orange)- 1/24 kids guessed correctly. 23/24 (biggest response) guessed cherry.

Wrong Colored Popsicle 2 (orange/blue raspberry)- 1/24 kids guessed correctly. 23/24 (biggest response) guessed orange.

Wrong Colored Popsicle 3 (blue/grape)- 2/24 kids guessed correctly. 22/24 (biggest response) guessed blue raspberry.

Wrong Colored Popsicle 4 (purple/cherry)- 2/24 kids guessed correctly. 22/24 (biggest response) guessed grape.

Answer

My hypothesis was correct. I guessed that kids would rely on their vision and use color to determine the flavor of the popsicles. Only about 4%-8% of the kids guessed the wrong-colored popsicles correctly. The rest of the students (majority of the students) for each wrong-colored popsicle trial guessed the flavor based on the color (i.e 23/24 guessed cherry for red). This means that perception of taste was affected by vision in my experiment!

What is next?

Now that I know my answer, I wonder why some people have a better sense of taste, and others need vision to help them. I wonder how perception of taste is different for those that are blind. Another wonder is how would the experiment have been different if I didn’t have a multiple choice survey and it was fill-in instead? What if I had told the students before the incorrect-color trial that the colors and flavors were mismatched? I would also like to try this out on people of other ages to see how age might change the results, since I only tried 6-year-olds and 7-year-olds.

References

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Bone, E. What happens when you eat? Usborne. 2016.

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Winter, E. 2025 SARSEF experiment- “How does vision affect perception of taste?”