Name: Healthy Candy?

Chewing gum and eating candy is tasty and fun. There are so many different brands and flavors to try! But what effect does it have on your teeth? You’ve probably heard some people say that chewing gum helps keep your teeth clean. You’ve also probably heard others say the exact opposite. How are we going to resolve this problem? We’re going to do an experiment, due to people with braces, we are going to use hard candy. The hard candy will have the same effect as the chewing gum. The three flavors that will be used are mixed fruit, peppermint, and cinnamon.

**Problem:**

Can the flavor of candy affect the amount of bacteria that is found in your mouth?

**Hypothesis:**

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**Materials:**

| 1 Apple, cut into 9 slices  3 Cups  Mint-flavored hard candy  Cinnamon-flavored hard candy  Fruit-flavored hard candy | Notebook  Pen  1 Pre-prepared petri dishes with agar  Sterile Cotton Swabs  Labels  Timer or Stopwatch |
| --- | --- |

· · **Procedure:**

1.  Take one petri dish that is filled with an agar solution. The agar will be the food source

for the bacteria. On the outside, bottom, of the petri dish, split the dish into 3 equal parts. Label

1 section, “**Mint**”, label the 2nd section “**Fruit**”, and label the 3rd section “**Cinnamon**”. Do not

open the petri dish.

2. Each student will eat a slice of an apple. Eating an apple will introduce sugar into the mouth.

3. Once finished eating the apple, each student will put one piece of candy in their mouth for

5 minutes. The teacher will keep track of time, the class will start together, at the same time.

Each student will start with the peppermint candy, first.

4. When 5 minutes is up, students will spit out any candy that is remaining in their mouth.

5. Each student will take out one swab from the package. You will gently swab your bottom gum

line with a cotton swab about five times. Make sure you take your sample from the same gum

line area for each volunteer. Consistency is important!

6. Spread the contents from the swab onto the agar, in a zigzag pattern. Make sure to stay within

the lines on the petri dish.

7. Repeat steps 1 through 5 for cinnamon and mixed fruit candy.

8. Carefully, place the lid on the petri dish after each trial, when all 3 candies have been tested you

will draw a “before picture” of your petri dish. Once you have drawn your picture, you will

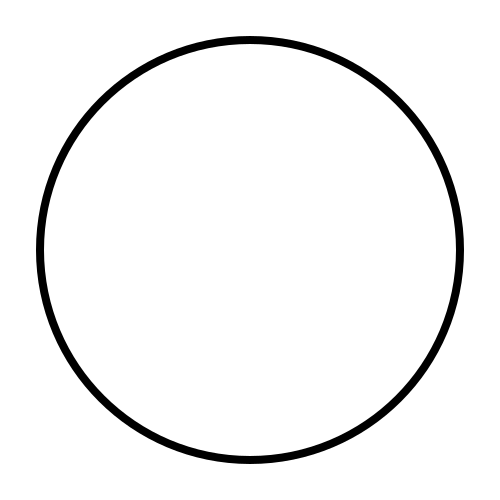
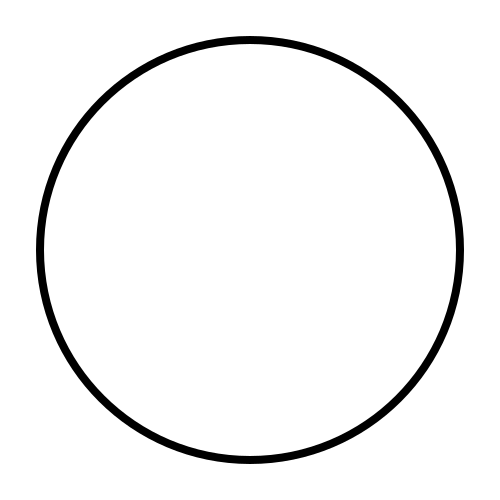
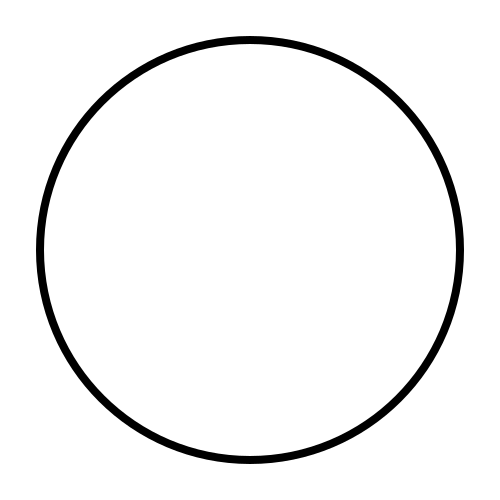
place the petri dish in the incubator.

9. Let the petri dishes sit in the incubator overnight.

10. Examine the petri dishes the following day. You will draw an “after picture” of your petri dish

for the duration of 3 days.

11. Take notes describing each dish’s germ growth.



**Data Collection:**

| **Day** | **Mint (# colonies)** | **Fruit (# colonies)** | **Cinnamon (# colonies)** |
| --- | --- | --- | --- |
| 1. |  |  |  |
| 2. |  |  |  |
| 3. |  |  |  |

**Classwide Collection of Data**

| **Student Name** | **Mint (# colonies)** | **Fruit (# colonies)** | **Cinnamon (# colonies)** |
| --- | --- | --- | --- |
| **1.** |  |  |  |
| **2.** |  |  |  |
| **3.** |  |  |  |

**\*add additional rows to include all students in the class.**

**Analyze Data and Conclusion:**

* Is the hypothesis supported by the data?
* Should you speak with other “sceintists” in your class to discuss their procedure and results?
* Would you be willing to recommend a candy flavor citing the fact that it WILL decrease bacteria in your mouth?
* Would you be willing to publish your data and stand behind your conclusion without any reservations?
* If not, what would need to happen with this experiment?
* To create a set of data, that would be scientifically reliable and accurate? What process do scientists go through to publish their work?

Further Research/Questions to Explore How would you improve upon this experiment?

https://www.education.com/science-fair/article/healthy-gum/

**This is an explanation for the teacher regarding the lab.**

Scientists have proven that gum chewing can help remove bacteria from our teeth because the friction from chewing gum rubs off many of the germs. However, this can never get rid of all the mouth’s bacteria. Sugar is like food for bacteria—the more sugar in the gum, the more the mouth bacteria will thrive. Fruit-flavored and other sugary chewing gums may remove some bacteria, but will cause their own bacterial growth in the mouth because of their high sugar content. Mint-flavored gums do an average amount of cleaning to the teeth because they generally have less sugar than fruity gums.

But why is cinnamon-flavored gum the best at cleaning teeth? Cinnamon has been scientifically proven to be a natural germ killer. Regardless of whether the gum has cinnamon oil, cinnamon flavor, or actual cinnamon as an ingredient, cinnamon-flavored gum excels at cleaning bacteria from the mouth. What if you tried foods other than gum? Or replaced them with liquids? You‘re well on your way to becoming a scientist in the making. Keep experimenting!