Science Experiment: Monster Marshmallows

Project: Foods

Supplies:

- **Microwave**
- **Paper plates**
- **Marshmallows**
- **Toothpicks**

Time: 15 minutes

What to Do:

1. Put two marshmallows on a paper plate and cook it in the microwave for 60 seconds.
2. Observe the marshmallows as they cook.
3. Once they have cooked for 60 seconds take them out of the microwave and let them set for a few seconds.
4. Pull off one marshmallow and observe it for color, content, and texture.
5. After the other marshmallow has shrunk back down pull it and form it into other shapes.

Reflect:

1. What happened to the marshmallows in the microwave? Why did they do this?
2. What color is the marshmallow on the outside? What color is the marshmallow on the inside?
3. How does it taste? Is it soft or crunchy?
4. What happened to the other marshmallow? Did it keep the shape you formed? Was it hard or crunchy when you ate it?
5. How is the reaction different when you roast a marshmallow over a fire versus putting it in the microwave?

Apply:

1. Are there any other situations where food reacts this way when being heated up?
2. What are some different textures of candy you've had? Why are some soft? Hard? Chewy?
3. How can you use this knowledge about heat and evaporation when baking or cooking in relation to the desired texture of your food?

Resources: Marshmallows are basically sugar, water, and air. In the microwave the water particles heat up quickly and vibrate, causing the water particles to heat up, which softens the sugar and the air bubble. As the particles heat up they move faster causing the bubble to expand, thus making the marshmallow grow. When you take it out of the microwave it cools and shrinks back down. Some of the water evaporates out which makes it crunchy or hard.

http://www.exploratorium.edu/cooking/candy/activity-mallows.html

Science Experiment: Amazing Eggs

Project: Foods,

Supplies:

- **Eggs, old and new**
- **Water**
- **Salt**
- **Pins**
- **Ice**
- **Saucepans**
- **Range tops to boil water**

Time: 10 minutes pre prep, 25 minutes to cook, 20 minutes to prepare deviled eggs

What to Do:

1. Divide old eggs purchased at least 10 days previous and new eggs. Do one of each in each of the following situations.
2. Prepare several comparisons:
    a. Start cooking eggs in one pan with already boiling water (cook in boiling water for 25 minutes then leave in water) and one where they start in cold water (bring cold water to boil, turn off heat and cover for 25 minutes. After 25 minutes plunge in an ice water bath)
    b. Prick a small hole in the large end of one egg and don't prick the end of another egg.
    c. Add salt to the water of one pan and none to another pan.
3. Cook eggs in b. and c. with the 'cold water' method as explained in a.
4. Once cooked, peel the eggs and pay attention to how easy or hard it was to do.
5. Pay attention to the shape and color of the eggs.
6. Cut each egg in half long ways to observe color of the yolk and texture of the whites.

Reflect:

1. Why did we use old eggs and new eggs?
2. What difference did you notice in the pee-lability between the old eggs and the new eggs, if any?
3. What do you notice about the shape of the 'pricked' egg and the non-priced eggs?
4. Was there any difference in the eggs cooked in salt water vs. fresh water?
5. Is there a difference in the color and texture of the eggs cooked with the 'hot method' vs. the 'cold method?'

Apply: Why is there a difference between the eggs' shape, texture, peelability, and color? Is there a difference in the taste of the eggs?

The temperature of the water affects how the proteins of the eggs cook. Egg proteins are wound up like little balls, but when heat is applied they start to unravel and form weak bonds with other groups of proteins. This results in coagulation and the solidifying of the egg white and yolk. What difference did you notice in the texture of eggs cooked with the cold water method versus those that stayed in the hot water for a longer amount of time? Why was there a difference in the texture? How about the color of the yolk? The longer the egg cooks the Sulphur in the yolk and the iron in the white has time to react and causes some discoloration and perhaps a stronger Sulphur smell.

Was there a difference in the shape of the eggs that had one end pin pricked and those that didn't? Eggs have a small air pocket on the large end of the egg; the white is encased in a thin membrane. When you prick that end the air can escape and the inside of the egg can expand and fill that space (the membrane keeps the egg white inside and keeps it from escaping).
Was there a difference in the peelability of old eggs compared to the new eggs? The higher the acid content in the eggs, the harder they are to peel because of the bond the acid makes with the side of the eggs. Carbon dioxide is a weak acid that escapes as the egg ages, thus weakening the bond and making them easier to peel.
Was there a difference in the taste of the eggs? Probably not. None of these methods necessarily affects the taste of the eggs (even cooking in salt water). However, the experience could be affected because of the texture and color of the eggs.

Source: http://www.exploratorium.edu/cooking/eggs/explore-text.html

Science Experiment: Tasty Sight

Project: Food Science, Health

Supplies:
Variety of flavored water (all clear)
Food coloring (optional)
Water (may want to use one for a sample)
Cups – small. Four cups (or how many different samples) per person.
Plain water or crackers to clear taste buds.
Blindfolds (optional)

Time:
15-20 minutes

What to Do:
Number cups for samples (or code so you know what flavor is in each cup).
When the liquids are all clear – people have a difficult time figuring out what flavor it is they are tasting.
You may also change the color of one of the flavors. For example – we made the orange flavored water green.
Give each person a sample of the water. Have them record the flavor. Have them drink plain water or eat a cracker before tasting the next sample.

Reflect:
Were you able to identify the flavors correctly?
Were you able to identify the flavor of the water with color correctly?
What role did your vision play in identifying flavors?

Apply:
How could this change the way someone that is blind would taste?
How do advertisers use sight to make us want to purchase their products?
Can you think of a commercial for food that looked so good it made your mouth water or made you want the food? Share what it was and what about how it looked made you want it.

https://faculty.washington.edu/chudler/chtaste.html

Science Experiment:
Taste and Smell
Project: Food Science, Health

Supplies:

Jelly Beans – variety of flavors
Water or crackers to clear the taste buds
Clothes pins (or just use your fingers)
Blindfolds

Time:

15-20 minutes

What to Do:

Give each member a specific color of jelly bean. Have them hold their nose and close their eyes while they eat the jelly bean. Ask them to share the flavor BEFORE they let go of their nose or open their eyes.
Drink water or eat a cracker between flavors to clear the taste buds.

Reflect:

Where you able to tell the flavor of the jelly bean that you were given while holding your nose?

What happened when you let go of your nose?

Apply:

When someone is sick or has allergies with a stuffy nose – how does it change what they want to eat?

Have you ever been told by a parent to "hold your nose" when you had to take bad tasting medicine? What happened when you let go of your nose?

This activity was based on information found at:

https://faculty.washington.edu/chudler/chtaste.html

Science Experiment:
Taste in the "Desert"
Project: Food Science, Health

Supplies:
Paper towel
variety of non-liquid items to try. Also try to include BITTER, SWEET, SALTY, and SOUR.
We used sweet potato cracker (without salt), salty cracker, sour candy, unsweetened chocolate.
Paper and pencil to record the results.
Optional – blind folds.
Water to rinse your mouth between tastes.

Time:
15 – 20 minutes

What to Do:
In order for food to have taste, chemicals from the food must first dissolve in saliva. Once dissolved, the chemicals can be detected by receptors on taste buds. Therefore, if there is no saliva, you should not be able to taste anything. To test this theory, dry your tongue with a clean paper towel. Once your tongue is dry, try tasting a few samples of salt, sugar or other dry foods. Rinse your mouth and dry your tongue after each test.

Reflect:
Where you able to taste the food item while your mouth was dry?
Did it taste different once the saliva returned to your mouth?
Where you able to tell BITTER, SWEET, SALTY, and SOUR?

Apply:
Have you ever been sick and have difficulty tasting? Share what that was like.
Sometimes medications can change the way food taste. Why is that important when people are sick?
Some people have "dry mouth". Do you think they taste food the same as other people?

Data collection: What flavor was it?

Sample 1	
Sample 2	
Sample 3	
Sample 4	

https://faculty.washington.edu/chudler/chtaste.html