Day 1: Science in the kitchen

We will teach the kids the scientific reason of how some things we see in the kitchen happen.

Ice cream in a bag

Materials:

- Milk
- Sugar
- Vanilla extract
- Ice
- Salt
- Two Ziploc bags
    - One small
    - One big
- Spoons

Activity:

Have you guys noticed that before a winter storm they put salt on the road? *Wait for students to respond. Do* any of you guys know why they do this? *Wait for responses*. Well, water usually freezes at 32°F, but whenever we add salt to water it freezes at a lower temperature. Salt can decrease the freezing temperature of water down to 2°F. One of the reasons we put salt on the road is to decrease the ice on the road, which is really dangerous. But today we will be using this really really low temperature to change matter.

Can someone tell me the three stages of matter? *Wait for responses*. Yes, that is right! Liquid, solid and gas. Do you know what causes water to freeze? *Wait for responses.* Yes, whenever it gets cold water freezes. Do you think it will be the same for milk? *Wait for responses.*

It might freeze but don't take my word for it, let's do an experiment. Today we will be making ice cream!

But first in order to make ice cream we will need to create an environment cold enough to freeze the milk. Here I have ice and salt, can anybody tell me how I can make it really cold in this Ziploc bag? *Wait for responses.* Yes! I will mix the ice and salt to make it really cold! Take some of the ice and place it in your Ziploc, now take some salt and put it in as well. Now shake that bag a pit to mix it all up. I'm going to be making ice cream too, but I won't be adding salt to my ice, what do you guys think will happen? What do you think will happen in yours, since you are using salt? *Wait for responses and make them write in their notebook their hypothesis.* Now we are giving you a smaller plastic

bag with some milk, sugar and vanilla flavor. Place that bag in the bag with ice and salt. Now shake it!

Open your bags and take out the smaller bag out. Is it frozen? Again to review, why did it freeze? *Wait for responses.* Why didn't my ice cream freeze? *Wait for responses. Have them write the results in their notebooks and let them enjoy their ice cream.*

Student notebook:

What do you think will happen to the milk if you don't add salt to the ice?

_____

What do you think will happen to the milk if you add salt to the ice?

_____

What happened to the milk in your bag?

_____

What happened to the milk in the bag that didn't have salt and ice?

_____

What juice is it?

Materials

- Small cups
- Apple Juice
- Pear juice

Activity:

Do you guys know how we taste food? *Wait for responses*. Yes, with our tongue. In our tongues there are many receptors that let your brain know if what you are tasting is sweet, salty or sour. This information travels from your tongue to your brain with the help of neurons. But did you know smell is also important for you to taste your food? When your tongue touches the food, the molecules in the food get attach to the receptors and tell your brain what you are eating. But, when your nose smells the food it is actually smelling compounds that are able to be in the air. They reach your nose and the receptors in your nose then also tell you brain what you are eating. When your sense of taste and smell are working together you can taste better your food.

But don't take my word for it, let's do a simple experiment. We are going to place two cups in front of you, they each will have a different juice. Then I'm going to ask you to taste juice A and juice B but with your nose plugged. Then I'm going to ask you to taste

them again but with your nose unplugged. What do you think will happen? *Wait for responses and help them formulate a hypothesis. Have them write their hypothesis in their notebooks.*

Now, plug your noses and taste juice A. Write in your notebook what flavor do you think it is. Keep those noses plugged! Now taste juice B and write what flavor do you think it is. *With the help of volunteers make sure they are writing in their notebooks.* Now do the same but this time with your noses unplugged. And write what you think the flavors are.

Now tell me, what flavor is juice A? *Wait for responses.* What flavor is juice B? *Wait for responses*. Was it easier to figure out the flavor with your nose plugged or unplugged? *Wait for response.* As a review, can someone tell me why it's easier to know the flavor of the juice with our noses unplugged?

Student notebook

Will you be able to taste the juice better with your nose plugged or unplugged? (circle one)

	Juice A flavor	Juice B flavor
Nose plugged		
Nose unplugged		

Density

Materials

- Milk
- Pancake syrup
- Water
- Vegetable oil
- Dawn dish soap (blue)
- Graduated cylinder (or tall narrow clear container)
- Small cups
- Plastic droppers

Activity:

Have you guys noticed that whenever something with oil is cooking, the oil floats over the water? Do you know why that is? Well, this is because the density of oil is less than that of water. Has someone ever heard that word: density? *Wait for responses*. Density is how much stuff is packed into a particular area. That means that the volume or the quantity of two different things might be the same but their densities are different. For example, I measured the weight of this feathers and the weight of this flour, and it is the same. But which one occupies less space? *Wait for responses*. Yes, the feathers occupy less space because they are less dense. But we use other liquids in the kitchen besides water and oil. Can you mention some? *Wait for responses*. What about milk, honey and dish washer liquid? Which one has more density? Let's answer that question with an experiment.

You have in front of you the same quantity of different liquids that we can find in the kitchen. Milk, pancake syrup, water, vegetable oil and dish soap. Now we are giving you a cylinder. We are going to pour the liquids very slowly and see if they have different densities. Which liquid do you think will be denser? *Wait for responses.* Okay, write that in your notebook. Now take any liquid and put it in your dropper and put it in the cylinder, slowly. Now do the same for all the liquids. What happened? Which one is denser? *Wait for responses*. Yes, the pancake syrup is at the bottom because it has more stuff in the same volume as the other liquids. Where is the oil? Is it denser than water? *Wait for responses*. No, it's not. This is why it floats while we are cooking.

It looks okay in that cylinder but what if we calculate the density? Let's calculate the density of oil and water! The equation we use to calculate is density= the mass, which is related to how much something weights over the volume. The equation is in your notebooks and I have given you the mass and volume of oil and water. Let's all calculate it together. *Write in the board the equation and do it with the kids. Have them write it in their notebooks too.* As a review can someone tell me what is density? *Wait for responses and review the concept with the kids.*

Student notebook

Which liquid do you think is denser? _____

Write the order of the liquids:

Top

_____

_____

_____

_____

Bottom

_____

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

Water mass = 5g

volume = 5ml

Density of water = _____ =

Oil mass = 4.6 g

volume = 5ml

Density of oil = _____ =