February 2, 2008

Sometimes I just love to have a nice thick milkshakes. How about you? Have you ever had a milkshake that is so thick that you can't seem to suck any of it up. Why is this? It all has to do with air pressure, so you can suck and suck until you are blue in the face and you won't get anything up the straw. Try this experiment to find out what I'm talking about.

***Always remember to ask an adult before doing any Science experiment.**

Materials:

Small jar with the lid
Straw
Plasticine
Knife (optional)

Procedure:

1. Fill the jar up with water.
2. Poke a hole in the lid big enough for the straw. This is where you make need an adult to help you cut a hole with the knife.
3. Put the straw into the water, and seal the hole around it with the Plasticine.
4. Make sure there are no leaks anywhere.
5. Try sucking the water up. What happens?

Explanation:

You shouldn't have been able to suck any water up through the straw, why is this? Well like I said it all has to do with air pressure. When you drink from an open glass of water, or a glass with a lid that allows air into the glass the air pressure allows the water to travel up the straw and into your mouth. When you suck on the straw you reduce the pressure inside your mouth, and the surrounding pressure on the water pushes down on it, forcing up the straw and into your mouth where there is less pressure. But when you block of the air pressure like you did when you sealed it in the jar, then there is no pressure to push on it and force the water into the straw. So the water stays right where it is in the glass.

With the thick milkshake there isn't enough pressure to push it up the straw, and you likely collapsed the straw sucking on it so hard and there is no where for the milkshake to go. Give it a few minutes and try again, once the ice cream melts a little bit.

February 9, 2008

We tried this experiment at the Praxis Family Science Olympics a few months ago and I thought that I turned out really good so I would use it for one of the weekly Science Smarts

Columns. What would you do if you had two cans of pop, one was diet and one was regular and you couldn't read the labels on them and you needed to know which was which? How could you figure out which can was the regular pop and which is the diet? I have a quick simple way to figure it out. It has to do with what is used to sweeten the pop.

***Always remember to ask an adult before doing any Science experiment.**

Materials

Can of Regular Soda*
Can of Diet Soda*
Sink or deep bowl full of water
*The soda should be of same type for example use a can of Coke® and a can of Diet Coke®

Procedure

1. Fill up your sink or bowl with water
2. Place the can of regular soda into the water. What happens? It should sink to the bottom
3. Next place the can of diet soda into the water. What happens? It should float. What is going on here?

Explanation

The regular soda has lots of sugar in it to make it sweet and the sugar is heavy. Thus the can of regular pop sinks to the bottom. Diet soda has artificial sweeteners in it. These artificial sweeteners are a lot sweeter than regular sugar, so it takes a lot less of them to sweeten a can of diet soda. Therefore the diet soda is lighter and will float on the water.
If you really don't believe it you can measure out a cup of Granular Splenda® into a bag and then into another bag measure a cup of sugar and compare their weights. The sugar is a lot heavier.

February 16, 2008

Sweet Sugar

With this cold weather that we have been having a lot of lately I have really been enjoying my nice hot cups of tea. I personally like to have a little sugar in my tea to sweeten it up. Thinking about my cups of tea reminded me of an experiment that I know, so this week I have an experiment that deals with sugar and its sweetness. Does it make a difference to the sweetness if you put the sugar into a drink when it is hot or when it is cold? Try the experiment to find out.

***Always remember to ask an adult before doing any Science experiment.**

Materials

Sugar
Spoon
2 Tea bags
Kettle
Water
2 Mugs
Napkin

Procedure

1. Boil the water in the kettle (you may want to have an adult help you with this)
2. Label the mugs, one with hot and one with cool, or something like that
3. Carefully pour the boiling water into the 2 mugs (again you may want to have an adult help you with this)
4. Put a tea bag in each of the mugs.
5. Into the hot mug add two tablespoons of sugar and stir.
6. After a few minutes remove the tea bags from both mugs, and set the mugs aside to cool.
7. Once both mugs are cool add two tablespoons of sugar to the mug labelled cool, and stir until it is dissolved.
8. Taste the tea in both mugs, which one is sweeter?

While the tea is cooling try this.
Stick your tongue out and pat it dry with the napkin, make sure you get it really dry. Now put a bit of sugar on it, what do you taste? You shouldn't be able to taste the sweet sugar at all. Now pull your tongue back in your mouth and let the sugar dissolve in your mouth, now can you taste it? Sugar needs to be dissolved in a liquid for it to taste sweet to us.

Explanation

The cup of tea that had the sugar stirred into it while it was hot should have tasted sweeter. Why do you think that this is?
At first you might think that it had to with the hot water dissolving more sugar, but we put the same amount of sugar into both mugs, and all the sugar should have been dissolved in both. So that can't be it.
Well it has to do with what sugar is. Sugar is also known as sucrose, well the hot water made the sucrose break down into fructose and glucose, through a process called hydrolysis. By hydrolysing the sucrose into the fructose and glucose you are making it about 10 to 20% sweeter.

February 23, 2008

Have you ever put ice cream in a metal bowl and noticed how quickly it melts, but when you have ice cream in a plastic bowl it takes quite a while to melt. Why does this happen?

***Always remember to ask an adult before doing any Science experiment.**

Materials:

Thick flat piece of plastic or wood (a cutting board will work)
Heavy metal pot or pan
2 ice cubes

Procedure:

1. Place the pot and the plastic or wood onto a flat surface and feel both of them with your hand. Which one feels cooler?
2. Place an ice cube onto each of the surfaces, and watch what happens.

Explanation:

First off the pot or pan should have felt cooler than the wood or plastic. Because of this most people would think that the ice cube on the metal would take longer to melt, but this isn't what happens. Why is this? Well metal is a good conductor of heat; that is why it felt cooler in the first place, it is a quick and easy pathway for energy to take. Both the plastic and the metal are at room temperature but the metal felt cooler because it pulled the heat from your finger faster, making it feel cooler.
When two objects come in contact there is a transfer of heat from the warmer object to the cooler object, how fast this transfer happens depends on how big of a temperature difference there is between the objects and how good they are at conducting heat. With the plastic the ice quickly cooled the surface it was touching to a temperature close to the temperature of the ice quickly. The process then quickly slowed down because the plastic is a bad conductor. With the metal as the spot touching the ice was cooled more heat quickly flows in to replace it, this continues and the ice quickly melts.