

October 2 – Reflexes

Have you ever thought about how your body knows to do certain things? If you've ever touched something really hot with your hand, you pull it away from the heat source before you've even had to think about it. That is called reflexes and we use them every day. This experiment will test the speed of your reflexes.

Always remember to ask an adult before performing any science experiment.

Materials:

- Non-bendy ruler
- Test subjects (friends and family)
- pencil
- paper

Procedure:

1. Have your test subject sit or stand (you may want to test to see if there is a difference between sitting and standing).
2. Hold the ruler with the 0 cm mark between the test subjects first finger and thumb. Make sure the test subject is not holding onto the ruler.
3. Drop the ruler and let the test subject grab the ruler.
4. Write down the distance on the ruler that it was grabbed.
5. Try this with both the dominant and non-dominant hands. Test different subjects to see if boys have faster reflexes than girls, etc.

Discussion:

The distance that the ruler traveled is equivalent to the amount of time it took for the test subject's reflexes to kick in. For a reflex to happen a lot of messages have to travel through your body. First you have to sense what is happening around you. In this experiment you use your eyes to see the ruler begins to fall. After your eyes tell your brain what is happening, your brain has to tell your hands what to do. This message travels to the muscles in your hands through passages called nerves. Your muscles will then contract and you will catch the ruler. Other reflexes work in different ways; some even bypass your brain.

Reflexes can differ a lot from one person to another. They can even differ between a person's right and left hand. Try to compare different groups of people to see if one group has better reflexes than the other. One more experiment to try is to test someone's auditory reflexes. Have the test subject close their eyes and say "now" when you let go of the ruler. See if their ears work better than their eyes.

If you enjoy reading about or doing these experiments, come down to MHHS on October 16, 2010 for the Family Science Olympics. There will be 10 science-based activities and lots of prizes. Complete 8 challenges and enter to win the grand prize of one night's accommodation at the Delta Bow Valley and a family pass to the Calgary Zoo; donated by the Delta Bow Valley Hotel in Calgary, AB. For more information call Karly at 403-527-5365 I look forward to seeing you there.

Karly Burr

Regional Executive Director

Praxis – The Science and Technology Hotline

October 9 – Bendy Bones

With everyone celebrating Thanksgiving this weekend, I thought we'd try an experiment with the leftovers. For this experiment you will need to keep two turkey wing bones. Make sure you clean any leftover meat off the bones and scrub them really well before you begin.

Always ask an adult before conducting any science experiment.

Materials:

- 2 Turkey wing bones
- 2 Mason jar or another jar with a tight fitting lid
- Vinegar
- Water

Procedure:

1. Test the strength of the turkey bone by trying to bend it.
2. Place one bone in each jar. Label one as water and cover the bones with water and label the other as vinegar and cover the bones with vinegar.
3. Let the bones sit undisturbed for two days.
4. Take the bones out of the solution and rinse each of them.
5. Test their strength again, by seeing if you can bend the bones.

Explanation:

Bones have lots of calcium in them in the form of calcium carbonate. The vinegar, which is an acid, reacts with the calcium carbonate in the turkey bones to form carbon dioxide, water and calcium acetate. The carbon dioxide is released in the bubbles that you can see forming during the reaction. Due to the reaction, the calcium will leave the bones, which is why the bones are soft when you take them out of the vinegar. This is why it is important to get calcium in your diet. The bones left in water did not get soft because the water cannot extract the calcium out of the bones.

This same experiment can be completed with an egg. Egg shells are made out of calcium carbonate. Try it with a hardboiled egg to get rid of the shell, or try it with a raw egg for a slightly messier approach.

National Science and Technology Week begins October 15 and Praxis is starting the week off with a bang. Come to Medicine Hat High School on Saturday October 16 from 10 am – 3 pm for the Family Science Olympics. There will be 10 exciting science challenges and fun for the whole family. Complete 8 of the activities and enter to win the grand prize of one night's accommodation and a family pass to the Calgary Zoo courtesy of the Delta Bow Valley Hotel in Calgary. Each "family" must have one person over the age of 18 years to participate. For more information about the Family Science Olympics contact Praxis at 403-527-5365. I look forward to seeing everyone there!

Karly Burr

Regional Executive Director

Praxis: The Science and Technology Hotline

October 16 – Honeycomb Candy

National Science and Technology Week has begun. To celebrate Praxis and APPEGA are hosting the Family Science Olympics at Medicine Hat High School from 10 am – 3 pm. If you enjoy exploring new things come down to the 5th Street entrance of MHHS to participate in exciting science challenges. Each family must have at least one person over the age of 18 years and everyone is eligible to win prizes. Complete 8 of the 10 activities and your “family” will be entered to win the grand prize of one night’s accommodation, a family pass to the Calgary Zoo, 20 zoo bucks and a complementary night of parking; generously donated by the Delta Bow Valley Hotel in Calgary, AB. These activities are exciting and fun for people of all ages! I look forward to seeing you down there.

Here is a quick and tasty experiment to try today.

Remember to always ask an adult before doing any science experiments.

Materials:

¾ cup Sugar
2 tablespoons honey
2 tablespoons water
1 ½ teaspoons baking soda
Baking dish
Saucepan
Candy thermometer

Procedure:

1. Grease the baking dish
2. Put all the sugar, honey and water in the saucepan. Cook over high heat until the mixture reaches 300F (the sugar will melt and bubble and the mixture will begin to caramelize).
3. Take the saucepan off the heat and add the baking soda. Gently mix until just combined. Be careful to not over mix.
4. Pour the mixture on the baking dish and allow to cool. Do not spread the mixture.
5. Once it’s cool, you can break it into smaller pieces and eat!

Explanation:

You have just made honeycomb candy. The bubbles in the candy are from the baking soda. When baking soda reacts with water it forms carbon dioxide gas. This is why baking soda is added to muffins and pancake batter; it helps make the batter rise as it is baked. The candy made in this experiment is very thick and viscous (it resists flow), so when the carbon dioxide is released by the baking soda reaction it gets trapped in the candy forming the bubbles you see.

Happy Experimenting!

Karly Burr

Regional Executive Director

Praxis – The Science and Technology Hotline

October 23, 2010 – Shrunken Heads

I thought we'd try a spooky experiment this week because it is getting so close to Halloween. Before we get into the experiment I just wanted to thank all of our fantastic volunteers for making the 2010 Family Science Olympics a huge success. Over 200 people participated and the volunteers ran the events with enthusiasm! Now, let's get experimenting.

****Remember to always ask an adult before completing any science experiment**

Materials:

- Large apples – Granny Smith work well
- 1 Cup Lemon Juice
- 1 Tablespoon Salt
- Peeler
- Spoon
- Re-sealable Plastic Bag

Instructions:

1. Peel the apple and use the spoon to carve out a face. Carve large facial features, any small details will be lost once they've dried.
2. Mix the salt and lemon juice together in the plastic bag.
3. Place the apple in the bag, squeeze out the air from the bag and let the apple sit in the fridge over night.
4. Take the apple out of the bag and pat dry. Place the apple head in a warm dry place and allow it to fully dry out (this will take a few days).
5. You can use the shrunken head to decorate for Halloween!

Explanation:

Fruits and vegetables are made up of water. When you remove the water from fruits or vegetables, they shrink down. This is why raisins are usually much smaller than grapes. In this experiment there are two major things going on with the apple. The lemon juice that the apple was soaked in helped to slow the browning process of the apple. Usually exposed apple flesh will begin to brown because it is affected by the oxygen in the atmosphere. Soaking the apple in the lemon juice helps to slow that process down.

The salt also helps to shrink the head. Salt can act as a desiccant, which means it helps to dry out the apple. The salt helps by pulling water out of the lemon.

If you were to leave an apple, or any other fruits or vegetables out on the counter or in the fridge, there is a good chance they would rot before they dry out. This is because bacteria and fungi are everywhere. When the bacteria or fungi eat the produce they rot. The salt and lemon juice also help to prevent the apple from rotting by making the apple less attractive to bacteria and fungi. They do not like the salt or the acid from the lemon juice.

Now that you have such wonderful shrunken heads, use them to decorate your house for Halloween.

Happy Experimenting!

Karly Burr

Praxis – The Science and Technology Hotline

October 30, 2010

Halloween has to be one of my favourite holidays. Not only do you get to dress up in a crazy costume (last year I was a mad scientist) but you also get candy. To make this year's Halloween extra spooky, try the experiment today.

Materials:

- Good Quality latex balloon
- 1/4" hex nuts

Directions:

1. Squeeze the hex nut through the mouth of the balloon. Make sure that the hex nut goes all the way into the balloon so that there is no danger of being sucked out while blowing up the balloon.
2. Blow up the balloon, but be careful not to over inflate it, as it will burst very easily.
3. Tie off the balloon and you're ready to go.
4. Grip the balloon at the stem end as you would a bowling ball. The neck of the balloon will be in the palm of your hand.
5. While holding the balloon palm down swirl it in a circular motion. The nut may bounce at first, but eventually it will begin to roll around the sides of the balloon.
6. Hear that sound?
7. Once the nut begins to spin, use your other hand to stabilize the balloon. The sounds should continue for almost 10 seconds after the balloon has stopped moving.

Explanation:

Today we've learned about two things: centripetal force and producing sounds. Centripetal force is the inward force that acts on an object moving in a circular path. So as the balloon spins and the hex nut travels in a circle around the balloon, there is a "centre-seeking" force acting on the nut.

In this experiment the nut vibrates the balloon and produces sound. A hex nut has flat sides. These flat sides slide, bounce and vibrate along the inside of the balloon. These movements cause the balloon to vibrate and produce sound. If you were to complete the activity and put a dime in the balloon instead of the hex nut, the dime would demonstrate centripetal force, but would not produce sound because a dime is round. The round dime would glide much easier over the balloon surface and not produce any sounds.

Happy Experimenting!

Karly Burr

Regional Executive Director

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