November 7, 2010 – Science Smarts

I hope everyone had a safe and happy Halloween! This week we will be having a race between two ice cubes, and seeing what material will make them melt the fastest.

Materials:

1. Two ice cubes of similar size
2. Wood/bamboo chopping block
3. Cast Iron skillet
4. Pennies to hold the ice cubes

Procedure:

1. Turn the skillet over and place an ice cube on it. Place pennies around the ice cube (but not touching it).
2. Place an ice cube on the chopping block. Surround it with pennies as well.
3. Wait for the ice to melt.

Explanation:
Melting ice takes a lot of energy. Usually this energy comes from the area surrounding the ice cube. This is why ice can cool down your drink.
The speed at which the ice melts depends on how fast this energy can be transferred to its surroundings. In this experiment the skillet can conduct heat much better than the chopping block. This is because metals conduct heat very well, while wood materials do not. To melt the ice cube, heat is transferred from all over the skillet to the ice cube, making it melt faster. Because the heat from the skillet is transferred to the ice cube to melt it, the skillet also cools down. That is also why the skillet is now colder to the touch than before the experiment.
If you enjoy doing these experiments, you would really enjoy science fair. Check out this month's Science Smarts column for more science fair information, tips and tricks. For more information please contact Karly at Praxis: 403-527-5365 or Karly.burr@praxismh.ca.

Happy Experimenting!
Karly Burr

Regional Executive Director
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November 13, 2010 - Yeast

Science Fair is an excellent opportunity to learn more about the scientific process, deductive reasoning and public speaking. By far, the most difficult part about science fair is choosing a project, so I thought it would be a good place to start.
When choosing a science fair project, start by looking around you. What are you interested in? Do you see a problem that needs a solution? Is there a topic that you want to learn more about? Once you have narrowed your focus to something that interests you, research and project design is much easier. I have always been intrigued by microbiology, so here is an experiment based on that!

Materials:

- 2 Packets of dry active yeast
- Two water bottles
- Two balloons
- Warm water
- Cold water
- Sugar

Directions:

1. Label one bottle as warm and one as cold.
2. Divide one package of yeast between the two water bottles.
3. Pour ½ cup cold water into the "cold" bottle and ½ cup warm water into the "warm" bottle. Stretch the balloon over the top of the bottle to collect the gas.
4. Determine which temperature of water caused the yeast to produce the most gas.
5. Dump out the yeast and clean the water bottles. Label one as sugar and one as none.
6. Divide one package of yeast between the two water bottles.
7. Add 2 tablespoons of sugar to the bottle labeled sugar.
8. Pour ½ cup warm water into both water bottles and stretch the balloon over the bottle to catch the gas.

Explanation:
Yeast is a living microbe. It is added to bread to make it rise, because the yeast will eat sugar in the bread dough and produce gas which gets trapped in the dough. Yeast is a living thing, and therefore it has certain requirements to live.
In the first part of the experiment, the warm water caused more gas to be produced than the cold water, because the warm water activates the yeast better. This mean the yeast likes the warm water better than the cold. In the second part of the experiment, the yeast produces much more gas in the sugar bottle. This is because the yeast has a food source and is able to metabolize (eat) it. This experiment helped determine the optimal conditions for the yeast. To expand this experiment, you could try using different kinds of yeast, vary the amount of sugar or try using different temperatures of water and measure it using a thermometer.
Just by looking around at what is available, I have a microbiology project! Remember, if you require assistance with your project, call Karly at Praxis: 403-527-5365.
Happy Experimenting!
Karly Burr
Regional Executive Director
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November 20, 2010 - Blubber

I hope everyone has their mittens and scarves ready to go, because winter is coming. Have you ever noticed that people have to bundle up in lots of warm clothes for the winter, but animals like Polar Bears do not? Today we are going to find out why those huge bears don't need toques and parkas.

Always ask an adult before performing any science experiment

Materials:

- 2 large re-sealable plastic bags
- Large tub / sink full of cold ice water (or a snow bank)
- Lots of lard / shortening

Directions:

1. Fill the sink or container full of ice cold water
2. Put your finger in the water / snow bank. Notice how cold it is?
3. Put your hand into one of the plastic bags and place in the water. Did this change the temperature your hand feels?
4. Line the inside of that plastic bag with the lard / shortening. Place the second plastic bag into the first one; this will help you keep your hands clean.
5. With your hand in the bags, place it in the cold water. Can you feel the cold water now?

Explanation:
When you surrounded your hand with the lard and then put it in the water, the water didn't feel cold. This is because you insulated your hand with the lard. Lard and body fat are very similar. Polar bears have a thick layer of body fat called blubber around them. The fat helps keep their body temperature constant, by keeping the warmth inside their bodies. Winter jackets use the same principle, but contain different man-made materials instead of lard to keep you warm. You can try this experiment, substituting different materials for the lard to determine what makes the best insulator.

Happy Experimenting!
Karly Burr
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November 27, 2010

November 27 – Water Properties

Hopefully everyone has been keeping warm. This week I thought we'd do another cold experiment and explore the different properties of ice and water.

Always remember to ask an adult before doing any science experiment

Materials:

- Coloured water
- Ice cube tray
- Drinking glass
- Light coloured cooking oil

Directions:

1. Using some food colouring, dye the water and then put in the ice cube trays.
2. Put the ice cube trays in the freezer overnight to make coloured ice cubes.
3. Fill the glass ¾ full with the cooking oil.
4. Take a coloured ice cube out of the tray and place it in the glass of oil.
5. Watch what happens as the ice melts.

Explanation:
Many of us already know that oil and water do not mix. We also know that oil floats on top of water, because it is less dense than water. This basically means that water is heavier than oil. Ice is the solid form of water. Did it float or sink in the oil? One of the properties of ice is that it is less dense than liquid ice. The difference in density (weight per cubic centimeter) is what makes ice float in water.
In this experiment, the ice cube should have floated on top of the oil. This means that ice is less dense than the oil. As the ice melts, the water formed by the melting ice would have slowly sunk below the oil forming a coloured layer at the bottom of the glass.
It is very important in nature for ice to be less dense than water. This allows fish and other animals to survive in lakes and ponds. In a deep pond or lake, the ice will form a layer on the top of the water and allows the fish to live. If the ice sunk, most lakes and ponds would turn completely to ice!

Happy Experimenting!
Karly Burr
Regional Executive Director
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