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LAB SCIENCE

About Our Program!

The Michigan Department of Community Health (MDCH) Bureau of Laboratories is the State Public Health Laboratory. We are proud to announce our Explore Lab Science Program.

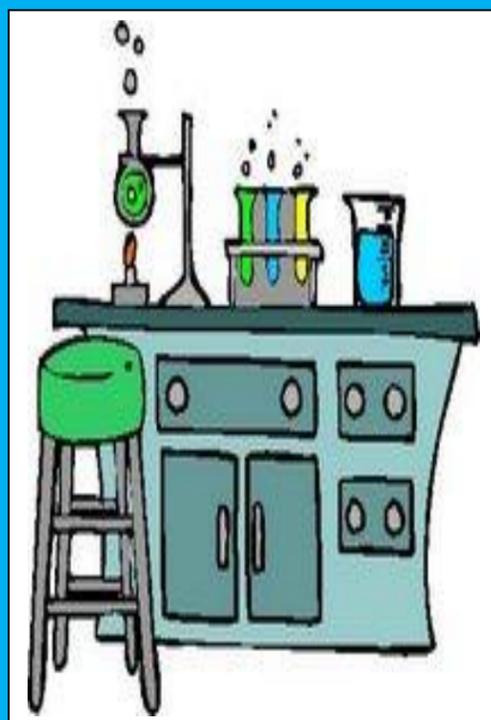
The goal of the Explore Lab Science Program is to introduce children to lab science at an early age.

Visit Our Website!

www.michigan.gov/explorelabscience

- Take a tour of our laboratory online.
 - We have short video clips that highlight testing areas within our laboratory!
- Learn about science by participating in games and activities online.
 - Watch the *Why Am I Sick* video and learn about good germs and bad germs!
- Find additional experiments to complete at home.
 - Learn about cell structures by making your own pizza. Check out *Life Inside a Cell!* for more information.

All of these activities and more are available at:
www.michigan.gov/explorelabscience



Try Our Experiments!



This activity packet contains experiments that can be completed at home (with adult supervision). Enjoy learning about science and don't forget that science is all around us! Continue to learn about science this fall!

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Featured Experiments:



Not So Plastic Milk



Make Your Own Hand Sanitizer



Make Your Own Rock Candy

Not So Plastic Milk

This experiment is ideal for students in 3rd - 8th grade with adult supervision

You will need:

- One cup of milk
- 4 teaspoons of white vinegar
- A bowl
- A strainer

Steps:

1. Heat up the milk until it is hot, but not boiling; it is best that you ask an adult to help you.
2. Carefully pour the milk into the bowl.
3. Add 1 tablespoon of vinegar to the milk at a time; continue to add the vinegar until you have added 4 tablespoons.
4. Stir the milk and vinegar with a spoon for 3 minutes



5. Pour the milk and vinegar mixture through the strainer into the sink.
6. You will notice clumps left in the strainer.



7. Allow the clumps to cool down; this should take about 7-10 minutes. Once the clumps are cool, you can rinse them off in water while you gently mold them together.
8. Create a cool shape with your clumps and then allow it to harden in a few days.

What just happened here?

Casein, from the Latin word meaning *cheese*, is a protein found in the milk of mammals. When **casein** is introduced to the acid in vinegar, it does not mix well with the acid. The acid in the vinegar changes the acidity of the milk, and causes the protein in **casein** to change. As a result, the milk and acid mixture forms blobs or clumps. The blobs or clumps resemble a glue-like substance that can be used to form a shape or mold things together. **Casein** is used in adhesives, paints, and even plastics.

Make Your Own Sanitizer

This experiment is ideal for students in 7th - 12th grade

You Will Need

- Plastic bottle (you can use an empty hand soap or sanitizer bottle; just make sure the bottle is clean and dry)
- Funnel
- Large plastic bowl
- Plastic spoon
- ½ cup of isopropyl rubbing alcohol
- 2-3 tablespoons of aloe vera gel (you can find aloe vera gel in most drug stores or markets)

Steps:

1. Make sure that your plastic bowl is clean.
2. Combine the isopropyl rubbing alcohol and aloe vera gel in the bowl.
3. Mix the rubbing alcohol and the aloe vera gel in the bowl with a large plastic spoon. Be sure to mix the rubbing alcohol and aloe vera gel very well.
4. Place the funnel over the top of the bottle, and carefully pour the mixture through the funnel, and into the bottle.

How does sanitizer work?

When hand soap and water are not readily available, hand sanitizer is a good replacement. Hand sanitizer is made with isopropyl alcohol; therefore it can kill bacteria that may live on the hands. The alcohol in hand sanitizer is strong enough to cut the outer layer of oil on the skin; this outer layer is where bacteria may grow. Although hand sanitizer should not be used as a replacement for soap and water, it does kill some bacteria that can make you sick.



5 Ways to Avoid Food Borne Illnesses

1 Clean

Before handling any food, make sure that your hands have been thoroughly cleaned, especially after using restrooms and after touching animals. Clean food preparation surfaces before and after preparing foods.

2 Separate

Separate cooked foods from raw poultry, seafood, or meats.

3 Cook

Use a thermometer to make sure poultry and meats are cooked thoroughly. Cook meats, seafood, and poultry separately.

4 Temperature

Keep food at appropriate temperatures. Keep cold and perishable foods below or at 40 degrees. Keep hot foods, especially poultry and meats above or at 165 degrees.

5 Rinse

Rinse fruits and vegetables before eating. Rinse meats, seafood and poultry under running water before cooking.

Visit www.michigan.gov/explorelabscience for more activities!

Each year millions of people are treated for food borne illnesses. While most cases of food borne illnesses do not lead to death, thousands are hospitalized. Food borne illness can happen anywhere foods are prepared. It is important to make sure foods are prepared in safe and clean kitchens, and by clean personnel.

Bacteria or Viruses that cause the most food borne illnesses are E.Coli, Salmonella, and Listeria

Foodsafety.gov

Signs and symptoms of food borne illness may depend on the cause of the illness. Symptoms may range from mild to serious, and may last anywhere from 3 to 7 days. Signs and symptoms of food borne illness are:

- Vomiting
- Chills
- Stomach or abdominal pain
- Fever
- Diarrhea
- Headache
- Dehydration

If you think that you may have a food borne illness, then contact your health care provider immediately. For additional information on the causes, treatment and prevention of food borne illness visit

www.kidshealth.org/parent/firstaid_safe/home/food_safety.html

Make Your Own Rock Candy!

This experiment is ideal for students in 5th-12th grade; younger students may require adult supervision

You will need:

- A Popsicle stick or a chopstick
- A clothespin or a chip clip
- 2 cups of water
- 1 tablespoon of flavored extracts (such as mint or lemon; you can find these at your local grocery or market)
- Food coloring
- Large pot with a lid (a large bowl with a lid may work too; or any large container with a lid)
- 2 ½ -3 ½ cups of sugar
- A tall narrow glass or jar

Steps:

1. Clip the Popsicle stick into the clothespin so that it hangs down inside the glass or jar. Make sure the stick does not touch the bottom.

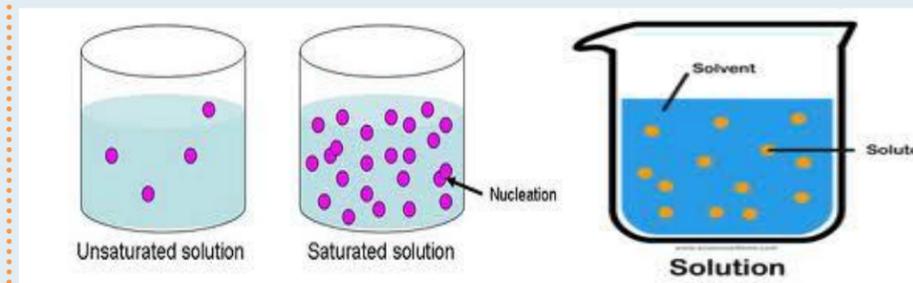


2. Remove the Popsicle stick and place it to the side for now.
3. Pour the water into a pan and allow it to boil.
4. Pour ½ cup of sugar into the boiling water and stir it until it dissolves.
5. Continue to add the sugar to the water; adding ½ cup at a time.
6. Stir the pot until all of the sugar dissolves.
7. After all of the sugar has dissolved, allow the pot to boil for at least 15 minutes.
8. Remove the pot from the heat and allow it to rest until the solution is cool.

9. Once the solution has cooled, add your choice of food coloring and/or your choice of flavored extracts. If you want to make more than one color or flavor, be sure to separate the sugar solution before adding any coloring or flavors.
10. Taste test the solution to see if the flavoring you added is to your liking.
11. Pour the sugar solution into the jar. Make sure that you do not fill the jar to the top.
12. Carefully place the Popsicle stick in the jar, again making sure the Popsicle stick does not touch the bottom of the jar.
13. Once the Popsicle stick has been carefully placed in the jar, place the jar (or jars) into the large pot. Place a lid on the pot.
14. Allow the jar (or jars) to rest for 3-7 days without disturbing them. After 7 days you should see some results. The longer the Popsicle stick sits, the larger your rock candy.

What just happened here?

When the large amount of sugar was dissolved in the water, it made a **supersaturated solution**. A supersaturated solution results when there is too much solute in a solution. In this case, there was too much solute (the sugar) for our solution (the water).



As the supersaturated solution cooled down, the sugar in the solution makes its way out of the solution as sugar crystals, forming and growing on the Popsicle stick or chopstick.



5 Steps for Proper Hand Washing

1

Wet
Wet your hands with warm clean water; afterwards apply hand soap.

2

Lather
Rub your hands together with the hand soap to create a lather. Make sure to cover all of your hands and under your finger nails.

3

Rub
Continue rubbing your hands together for at least 30 seconds.

4

Rinse
Rinse your hands completely under warm water.

5

Dry
Use a paper towel, towel or a hand dryer to dry your hands. If possible, use a paper towel or towel to turn the water faucet off.