STEM

Remember the Scientific Method

Ask Questions ***Research*** ***Hypothesize*** ***Experiment*** ***Analyze*** ***Share***

Science Journal:

Use a notebook, old or new, or get 21 sheets of paper then staple or paper chip those sheets together. Decorate the first page and put your name on it. You can write SCIENCE JOURNAL on it, too. Each day write or draw a picture of something that makes you want to know more about it. Ask your parents or other friends what you want to know or research it using books or the internet. You can email me your questions and I will do my best to answer them. If you see something and wonder what it is; you can send me a picture and I will try to find out for you or tell you where to look. My email is rkelley@ortn.edu .

On the calendar below, write or draw a picture of what the weather was like on each day.

	Monday	Tuesday	Wednesday	Thursday	Friday	
	April 27	April 28	April 29	April 30	May 1	
	May 4	May 5	May 6	May 7	May 8	
	May11	May 12	May 13	May 14	May 15	
	May 18	May 19	May 20	May 21	May 22	

Draw a picture of the clouds.

For this calendar:
Look at the Moon every night and draw a picture of the shape the moon appears to be. Does the moon look like it changes shape? Why does it seem to change shape? Did you see the moon during the day time?
Is it later when the sun sets? What season is it here in Oak Ridge, Tennessee?

	Monday	Tuesday	Wednesday	Thursday	Friday	
	April 27	April 28	April 29	April 30	May 1	
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Look at the night sky. Can you find the Big Dipper? It is part of a group of stars called a constellation. The constellation is named Ursa Major, or Big Bear. The Big Dipper is only a small part of it.

On this calendar:

Write or draw how you feel each day? 

	Monday	Tuesday	Wednesday	Thursday	Friday	
	April 27	April 28	April 29	April 30	May 1	
	May 4	May 5	May 6	May 7	May 8	
	May11	May 12	May 13	May 14	May 15	
	May 18	May 19	May 20	May 21	May 22	

Here is a list of things to look for and listen to during the next few weeks.

May 6 at noon- the test of the alert siren (It sounds for about 1 minute.)
Blue Jays, Cardinals all birds
Deer, rabbits, opossums (possums), raccoons, squirrels and other animals
Turtles, worms maybe even snakes
Flowers and trees- How many different colors and shapes of leaves can you find? Be careful and watch out for **POISON IVY**.
Insects (stay away from those that sting)
Spiders and their webs (**DO NOT MESS WITH THEM.**) Early morning when the dew is still on the grass is the best time. DEW is made water droplets that condense or collect on the grass.
The wind blowing through the trees.

Have you smelled a **SKUNK**? Do not chase it or you'll smell like that.

Rainbow Density Jar (any clear container)

You don't have to use lots of different chemicals to make a colorful density column. This project uses colored sugar solutions made at different concentrations. The solutions will form layers, from least dense, on top, to most dense (concentrated) at the bottom of the glass.

What You Need (Materials)

Sugar
Water
Food coloring (NOT gel food coloring)
Tablespoon
5 glasses or clear plastic cups

The Process (Procedure)

1. Line up five glasses. Add 1 tablespoon (15 g) of sugar to the first glass, 2 tablespoons (30 g) of sugar to the second glass, 3 tablespoons of sugar (45 g) to the third glass, and 4 tablespoons of sugar (60 g) to the fourth glass. The fifth glass remains empty.

2. Add 3 tablespoons (45 ml) of water to each of the first 4 glasses. Stir each solution. If the sugar does not dissolve in any of the four glasses, then add one more tablespoon (15 ml) of water to each of the four glasses.

3. Add 2-3 drops of red food coloring to the first glass, yellow food coloring to the second glass, green food coloring to the third glass, and blue food coloring to the fourth glass. Stir each solution.

4. Now let's make a rainbow using the different density solutions. Fill the last glass about one-fourth full of the blue sugar solution.

5. Carefully layer some green sugar solution above the blue liquid. Do this by putting a spoon in the glass, just above the blue layer, and pouring the green solution slowly over the back of the spoon. If you do this right, you won't disturb the blue solution much at all.

6. Add green solution until the glass is about half full.

7. Now layer the yellow solution above the green liquid, using the back of the spoon. Fill the glass to three-quarters full.

8. Finally, layer the red solution above the yellow liquid. Fill the glass the rest of the way.

Safety and Tips

The sugar solutions are miscible, or mixable, so the colors will bleed into each other and eventually mix. If you stir the rainbow, what will happen? Because this density column is made with different concentrations of the same chemical (sugar or sucrose), stirring would mix the solution. It would not un-mix like you would see with oil and water.

If your sugar won't dissolve, an alternative to adding more water is to microwave the solutions for about 30 seconds at a time until the sugar dissolves.

If you heat the water, use care to avoid burns.

If you want to make layers you can drink, try substituting unsweetened soft drink mix for the food coloring, or four flavors of a sweetened mix for the sugar plus coloring.

Let heated solutions cool before pouring them. You'll avoid burns, plus the liquid will thicken as it cools so the layers won't mix as easily. Use a narrow container rather than a wide one to see the colors the best,

Water Fireworks for Kids

Fireworks are a beautiful and fun part of many celebrations, but not something you want kids to make themselves, but even very young explorers can experiment with these safe underwater 'fireworks'.

What You Need

- Water
- Oil
- Food coloring
- Tall clear glass
- Another cup or glass
- Fork

Create Fireworks in a Glass

1. Fill the tall glass almost to the top with room-temperature water. Warm water is ok, too.
2. Pour a little oil into the other glass (1 to 2 tablespoons).
3. Add a couple of drops of food coloring.
4. Briefly stir the oil and food coloring mixed with a fork. You want to break up the food coloring drops into smaller drops, but not thoroughly mix the liquid.
5. Pour the oil and coloring mixture into the tall glass.
6. Now watch! The food coloring will slowly sink in the glass, with each droplet expanding outward as it falls, resembling fireworks falling into the water.

How It Works

Food coloring dissolves in water, but not in oil. When you stir the food coloring in the oil, you are breaking up the coloring droplets (though drops that come into contact with each other will merge... blue + red = purple). Oil is less dense than water, so the oil will float at the top of the glass. As the colored drops sink to the bottom of the oil, they mix with the water. The color diffuses outward as the heavier colored drop falls to the bottom.

Draw what you saw.

Magic Colored Milk Science Project

If you add food coloring to milk, not a whole lot happens, but it only takes one simple ingredient to turn the milk into a swirling color wheel. Here is what you do.

Magic Milk Materials

- 2% or whole milk
- food coloring
- dishwashing liquid
- cotton swab
- plate

Magic Milk Instructions

1. Pour enough milk onto a plate to cover the bottom.
2. Drop food coloring into the milk.
3. Dip a cotton swab in dishwashing detergent liquid.
4. Touch the coated swab to the milk in the center of the plate.
5. Don't stir the milk; it isn't necessary. The colors will swirl on their own as soon as the detergent contacts the liquid.

How the Color Wheel Works

Milk consists of a lot of different types of molecules, including fat, protein, sugars, vitamins, and minerals. If you had just touched a clean cotton swab to the milk (try it!), not much would have happened. The cotton is absorbent, so you would have created a current in the milk, but you wouldn't have seen anything especially dramatic happen.

When you introduce detergent to the milk, several things happen at once. The detergent lowers the surface tension of the liquid so that the food coloring is free to flow throughout the milk. The detergent reacts with the protein in the milk, altering the shape of those molecules and setting them in motion. The reaction between the detergent and the fat forms micelles, which is how detergent helps to lift grease off of dirty dishes. As the micelles form, the pigments in the food coloring get pushed around. Eventually, equilibrium is reached, but the swirling of the colors continues for quite a while before stopping.

Draw what you saw.

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