Wacky Liquid Science

Objective: Experiment with different materials to see silly things that can be done with science

Materials:

- Clear glass bowl (liter)
- Measuring tablespoon
- Measuring teaspoon
- Liquid cooking oil
- Food coloring
- Cup measurement
- Fork
- Spoon
- Liquid Starch
- Glue
- Wax paper
- Cornstarch
- Water
- Plastic tub/bucket
- Scissors
- Corrugated cardboard
- Ruler
- Pipe cleaners (covered w/ petroleum jelly)
- Bowl

15 minutes; Erupting Colors

1. Fill bowl with water
2. Pour 1 tablespoon of cooing oil into the cup
3. Add 4 drops of each of the food coloring colors (red, blue, and green)
4. Use the fork to beat the oil and colors until thoroughly mixed
5. Pour the mixture of oil and food colors onto the water in the bowl
6. Observe the surface and side of the bowl for 5 to 10 minutes

Results... Small pools of oil spotted with tiny spheres of color float on the surface of the water. Individual spheres of color appear to explode outward, producing flat circles of color on the surface of the water with streams of color that sink down through the water.
Why? Oil and water are immiscible. Immiscible means that they do not mix and will separate into layers. Because the food coloring is water based (it dissolves in water but not in oil), it remains in tiny spheres throughout the oil on the water's surface. The round, colored spheres sink through the oil layer and dissolve in the water layer below. At the moment the tiny drops of color touch the water, they quickly flatten on the surface and long streamers of color begin their descent.

10-15 minutes; Quicksand

1.Mix 1 cup cornstarch, ½ cup water, and food coloring together in a plastic tub or bucket.

Quicksand looks like a liquid, but if you knock on the surface, it appears hard. However, if you put a small toy on the surface, it will sink into the quicksand.

15-20 minutes; Slime

1. Using the spoon, mix the 1 teaspoon of liquid starch, 1 teaspoon of glue, and a drop of food coloring in the center of the sheet of waxed paper. Continue to stir the materials until they form a substance that begins to separate from the waxed paper
2. Allow the substance to stand on the waxed paper for 3 to 4 minutes. Then roll the substance into a ball with your fingers, and knead it with your hands for about 1 minute. You now have slime!
    - Roll the slime into a ball and drop it on a smooth surface
    - Set the ball of slime on a table and observe it for about 30 seconds
    - Hold the slime in your hands and quickly pull the ends in opposite directions
    - Hold the slime in your hands and slowly pull the ends in opposite directions
    - Play with it! See what different things it can do

Why does slime act this way? When you combine certain materials, their molecules do not simply mix but interact and undergo a chemical reaction. This means that a new substance unlike any of the substances that went into it is formed. In this investigation, the substance formed is called slime, a cross-linked polymer. A polymer is a very long chainlike molecule. Cross-links are chemical brides between the molecules. Slime is an unusual substance in that when pressure is quickly applied, it breaks like a solid. When left alone, it slowly flows like a liquid to take the shape of whatever container it is in. This behavior of slime describes its physical properties. But the behavior of starch when mixed with glue is an example of a chemical property (describes how one substance reacts with another) of starch, which is that it forms cross-links with the polymers in glue.

15 minutes; Water Walkers

1. Cut a 3 by 1 inch strip from the cardboard, cutting the 3-inch sides across the grooves. This strip will be the body of the insect.
2. Cut notches in the strip to shape the body into three parts. The middle body part should have three grooves.
3. Cut three 4-inch pieces from the pipe cleaner.
4. Stick each piece all the way through the three grooves in the middle part of the insect's body so that the same amount of it sticks out on either side. This makes the insect's legs.
5. Draw two eyes on the insect's head.
6. Bend each leg down where it meets the insect's body. Then bend about ¼ inch of the end of each leg out to shape a foot. Stand the insect on a table and adjust the bends in the legs so that each foot touches the table.
7. Fill the bowl three-fourths full with water
8. Slowly lower the insect into the water until its feet touch the surface, and then release it.

Results... The insect will stand on the water's surface.
Why? The cardboard insect, like real insects, can stand on the water's surface because of the surface tension of water.