Station: Cloud in a Bottle

Materials: One liter bottle, rubbing alcohol, pump (attached already)

Procedure:

1. Open the lid and pour a couple of drops of alcohol into the bottle so it puddles in the bottom.

2. Swirl the alcohol around inside the bottle. Make sure it coats the lower sides of the bottle. Look at the thermometer and make note of the temperature inside the bottle.

3. Close the and seal the lid with the quick-release top. Squeeze the pump on top to increase the pressure inside the bottle until it becomes too hard to pump with your hands. Look at the thermometer and make note of the temperature inside the bottle with the increased pressure. What change in temperature did you see?

4. When you're ready, activate the quick release causing a rapid decompression. You should notice a cloud forming immediately inside the bottle.

Station: Investigating Weathering and Erosion

Materials: Paper plate, Container with lid, 2 Different-colored markers, 5 Sugar cubes

Procedure:

1. Each person will choose one sugar cube and color the edges. As you do this, work over the plate so you do not get sugar everywhere. Only color the edges of two of the sugar cubes, not all five.
2. Count how many edges a sugar cube has.
3. Put one colored cube and all of the plain cubes in the container. Leave the other colored cube on the plate (this cube is for comparison purposes and will never be shaken).
4. Shake the container 40 times, counting out loud.
5. Open the container and put the cubes on the plate. Leave any grains of sugar that broke off inside the container. Observe and write down how the cube has changed.
6. Put the cubes you just shook back into the container. Leave the same sugar cube on the plate that you did before. Make sure the lid is on tightly.
7. Once you've done 3 trials of 40 shakes. What do the sugar cubes look like now?

Station: Water's Properties

Materials: Penny coin, 5 mL (1 tsp) plastic graduated pipettes with increments of 1 mL (0.2 tsp) or smaller, Plate or tray, Sheet of paper towel, 25 mL (5 tsp) rubbing alcohol in a cup, 25 mL (5 tsp) of water (distilled if possible) in a cup

Procedure:

1. Place the coin on a tray or plate.

2. Draw 1 mL of water into the pipette.

3. Carefully place drops of water, one at a time, onto the surface of the coin. Draw additional water into the pipette as needed, 1 mL at a time.

4. Keep track of the number of drops and volume (mL) of water used.

5. Stop as soon as the water spills over the coin.

6. Record results in Table 1 and clean the penny with a paper towel.

7. Repeat the steps using a clean penny, new pipette, and rubbing alcohol instead of water.

Station: Tippe Top

Materials: Paper plate, spinning top

Procedure:

1. Lay out a paper plate on the table.

2. Give the top a really fast spin and observe what happens.

3. What happened with the top before it ended its spin?

Station: Refraction Fun

Materials: Transparent Glass, Permanent Water, Piece of Paper, Water

Procedure:

1. Fill the transparent glass with water.

2. Using the black permanent marker, draw a horizontal arrow on the piece of paper.

3. Place the piece of paper with the horizontal arrow behind the transparent glass of water. Make sure the paper is touching the transparent glass of water and observe the horizontal arrow.

4. Move the piece of paper with the horizontal arrow away from the transparent glass of water and observe the horizontal arrow.

5. Try an image of your own!

Station: Newton's Nightmare

Materials: Copper tube, aluminum tube, PVC pipe, iron nut, neodymium magnets

Procedure:

1. Take a metal nut and drop it through each of the tubes and take note of what happens.

2. Now take the stack of neodymium magnets and drop them through each of the tubes.

3. What did you notice when the magnets were dropped through the copper and aluminum tubes.

Station: Melting Blocks

Materials: Melting blocks, ice, paper towel

Procedure:

1. Touch both blocks. Which feels warmer? Predict which block will cause ice to melt faster.

2. Place the O-rings on the blocks to prevent water from flowing off. Place an ice cube on each block.

3. Observe the rates at which the ice cubes melt. Which material is conducting heat into the ice faster?

4. After a few minutes, remove the ice and water, and touch the blocks again. Explain what you observe.

Station: Bernoulli's Principle

Materials: Blow dryer and a ping pong ball.

Procedure:

1. Turn on the blow dryer and hold it straight up to the ceiling.

2. Place the ping pong ball in the stream of air and let go.

3. Try tipping the blow dryer and see how far you can go.