Name _____ Date _____

Demonstration 2: Measuring Pressure

In this demonstration, you will create a simple tool called a manometer and use it to measure pressure at different depths under water.

Materials

- piece of aquarium tubing, 1.2-meter-long (4-foot-long)
- ruler
- permanent marker
- funnel (sized so the narrow end fits securely inside the aquarium tubing)
- small amount of waterproof modeling clay
- waterproof duct tape or plumber's tape
- piece of rubber such as a latex balloon (big enough to cover the wide end of the funnel)
- rubber band
- foam board, 56-centimeter x 71-centimeter (22-inch x 28-inch)
- large plastic cup
- water
- food coloring
- container large enough to fill with water at least 45 centimeters (1.5 feet) deep; possibilities include a large tub, trashcan, aquarium, or cooler
- large syringe (optional)
- tub or tray, at least 60-centimeter x 60-centimeter (2-foot x 2-foot) (optional, but helpful to contain possible water spills if doing the demonstration indoors)

Instructions to create the tool

1. Measure and make a mark 45 centimeters (18 inches) from one end of the aquarium tubing.

2. Insert the small end of the funnel into the unmarked end of the aquarium tubing. Press a small amount of waterproof modeling clay in and around the joint to seal it and then secure with waterproof duct tape or plumber's tape.

3. Place a piece of rubber over the wide end of the funnel and secure it with a rubber band and tape.

4. Turn the foam board so it is vertical. Tape the ruler to the center of the foam board.

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5. Pour tap water into a large plastic cup, and add a few drops of food coloring.

6. Pour the colored water into the open end of the aquarium tubing until it reaches the 45-centimeter (18-inch) mark, or use a large syringe to insert the water.

7. Tape the marked end of the tubing to the top of the foam board to the right of the ruler. Loop the tubing beneath the ruler and back to the top of the foam board on the other side of the ruler. Secure the tubing with tape. At this point, you should have a 60-centimeter (2-foot), U-shaped length of tubing looping around the ruler. The tubing should be about half-full of colored water. You should note that the water settles into the bottom part of the "U." The unsecured end of the tube should be connected to the funnel.

8. Mark the level of the water on the part of the tube not connected to the funnel. This will be your baseline for comparing pressure.

Instructions to use the tool:

1. Use the space below to predict how pressure measurements will change with water depth.

2. For each depth you want to test, place the funnel into a large container of water.

3. Look at the level of the water on the part of the tube not connected to the funnel, and compare the new level to the baseline.

4. Test the pressure at different depths, and record your measurements in the table below.

1. Make a prediction about how pressure measurements will change with water depth.

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2. Record your data in the chart below:

Depth	Inches of water in the tube

3. Summarize the results from your data in terms of the relationship between pressure and water depth.