Get $_2$ Know H_2O

EXPERIMENT 9: Water Facts

Challenge: Learn things you never knew about the physical properties of water!

WHAT YOU NEED:

- Your thinking cap

STEP-BY-STEP:

Read and reflect on the following facts.

1. Water is unique in that it is the only natural substance that is found in all three states—liquid, solid (ice), and gas (steam)—at the temperatures normally found on Earth. Earth's water is constantly interacting, changing and moving.

2. Water freezes at 32° Fahrenheit (F) and boils at 212° F (at sea level, but 186.4°F at 14,000 feet). In fact, water's freezing and boiling points are the baseline with which temperature is measured: 0° on the Celsius scale is water's freezing point, and 100° is water's boiling point. Water is unusual in that the solid form, ice, is less dense than the liquid form, which is why ice floats. (See lesson 6 on Erosion to see why ice is less dense than liquid water.)

3. Water has a high specific heat index. This means that water can absorb a lot of heat before it begins to get hot. This is why water is valuable to industries and in your car's radiator as a coolant. The high specific heat index of water also helps regulate the rate at which air changes temperature, which is why the temperature change between seasons is gradual rather than sudden, especially near the oceans.

4. Water has a very high surface tension. In other words, water is sticky and elastic, and tends to clump together in drops rather than spread out in a thin film. Surface tension is responsible for capillary action, which allows water (and its dissolved substances) to move through the roots of plants and through the tiny blood vessels in our bodies. (See EXPERIMENT #17 on Capillary Action.)

5. Here's a quick rundown of some of water's properties:

- Weight: 62.416 pounds per cubic foot at 32°F
- Weight: 61.998 pounds per cubic foot at 100°F
- Weight: 8.33 pounds/gallon, 0.036 pounds/cubic inch
- Density: 1 gram per cubic centimeter (cc) at 39.2°F, 0.95865 gram per cc at 212°F

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QUESTIONS:

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- What did you learn about water that you might not have known before? Were you surprised to learn these new things?
- What is the significance of what you learned? How can you take what you learned and be smarter when it comes to water?