STEM Sims™

Weird Water

Weird Water

Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.

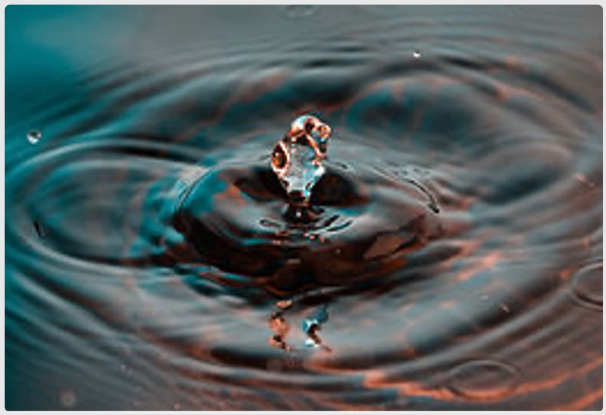
Water is a critical resource that maintains life on Earth. Take the following brief quiz to see how much you already know about water. See the bottom of page 4 to check your answers.

1. About how many gallons of water are used in the United States each day?
   a. 4,000,000
   b. 4,000,000,000
   c. 400,000,000,000
   d. 4,000,000,000,000

2. By how much does the volume of water change when it goes from a liquid to a solid?
   a. increases by 3%
   b. decreases by 3%
   c. increases by 9%
   d. decreases by 9%

3. Based on the average cost of municipal water, about how much would it cost to refill a 500-mL plastic bottle with tap water 2,000 times?
   a. $1
   b. $10
   c. $100
   d. $1,000

4. About what percentage of tap water leaks in the pipes that carry the water from the municipal supply to customers taps?
   a. 4.7%
   b. 17%
   c. 47%
   d. 77%



5. Imagine that all the water on Earth was placed in a 4.0-liter container. About how much of that water would be equal to the fresh water available on Earth.
   a. 0.015 liter
   b. 0.15 liter
   c. 1.15 liters
   d. 1.5 liters

Pick It Up!

Most people know that water can freeze and turn into ice. Ice tends to be very slippery and hard to handle. Do you think you can pick up multiple pieces of ice at once using only a string? Take this challenge and find out now.

Materials

1 – glass or bowl
5 – 6 ice cubes
½ cup tap water
½ teaspoon table
1- piece string ~ 30 cm long

Directions

Part I. The Initial Pick-up Try

1. Make sure that you get permission before conducting this experiment.
2. Place the 5 or 6 ice cubes in the bowl or glass.
3. Pour the water into the bowl or glass with the ice cubes.
4. Using the string only, try to pick up multiple ice cubes at once.
5. Describe your observations and results in Table 1.

Part II. Using the Salt

1. Sprinkle the table salt over the top surface of the ice cubes in the bowl or glass.
2. Lay the string so it is on top of multiple ices cubes in the bowl. Leave one end of the string outside of the bowl.
3. Carefully observe the string and ice.
4. Wait for between 1 – 2 minutes.
5. Using the string outside of the bowl, carefully lift the string up.
6. Describe your observations and results in Table 1.

Table 1. Investigation Results

Experiment	Observations
String and ice cubes only	
String + table salt + ice cubes	

Questions

1. Describe why you were or were not successful in picking up the multiple ice cubes with the string.

2. Describe the effects of adding the table salt to the ice and water in the bowl.

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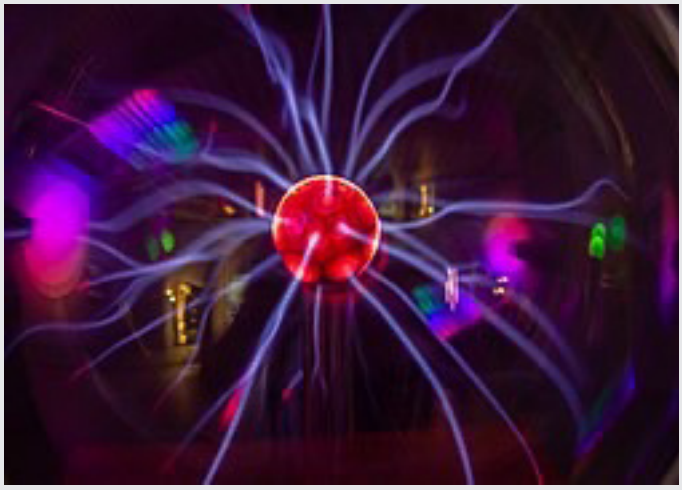
The Plasma State of Matter

Most people are familiar with the solid, liquid, and gas states of matter. But the most common state of matter in the universe is the plasma phase. The matter that makes up most stars in the universe is in the plasma form. The plasma state is achieved when enough energy is added to a gas to create a “soup” of positively and negatively charged particles of matter. One major difference between matter in the gas and plasma phases is the degree of electrical conductivity between the two states. While the gas phase is generally a poor conductor of electricity, the plasma phase is an excellent conductor.



Although matter in the plasma state is common throughout the universe, here on Earth matter in this form is rare. One of the two most common natural occurrences of matter in the plasma state is when the energy associated with lightning changes the particles in air from the gas to the plasma phase. The other example occurs when the heat energy generated by a volcano converts the materials ejected by the volcano into this phase. Neon and fluorescent lights along with arc welders are other examples of matter in the plasma phase that some people may experience here on Earth.

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STEMsims.com

Answers: Page 2 Answers: 1) c, 2) c, 3) a, 4) b, 5) a. **Page 3 Answers:** Pick It Up! 1) Answers will vary. The salt added to the ice should have made it easier to pick up the cubes. 2) The salt lowered the freezing point of the water on the ice and caused the string to be frozen into the ice.