Day 4 Experiment

H2Ohhh!

DISCOVERING GOD'S GIFT OF WATER TO THE EARTH

EXPERIMENT 1

Materials

- Frozen ice container from previous day
- 2-liter bottles filled with water, 1 per table
- 2-liter bottles, nozzles and tops removed, 1 per table
- Ice cubes, enough to cover the bottom of each empty 2-liter bottle without nozzles and tops
- Frozen Lake Pictures (DVD-ROM), 1 per table
- 4 x 4-inch wax paper squares, 1 per child
- Toothpicks, 1 per child
- Eyedroppers, several per table

Pre-Prep

1. On Day 3 during class, fill a glass with water and then carefully place it in the freezer. Let children watch as you fill it so they can see where the top of the water is and compare that to the level of the ice in the frozen container today. Mark where the level of water is. And then mark where the level of ice is.

Class Time Directions

Today, we’re focusing on the Bible as a letter of love. In the Bible, we learn that God loves us so much He gave Jesus Christ as Savior of the world. God’s one-of-a-kind gift is His Son, who can save us from our sins and give us eternal life when we repent of our sins and believe in Jesus.

The Bible also tells us about another unique gift of God. Read Genesis 1:1–2. From the very beginning, God gave liquid water to the earth as a special gift. The surface of the earth is about 70% covered by water, and all living things contain water.

Let’s explore several qualities of God’s wonderful gift of water. Let’s think about the first unique quality. Water can be found in three different forms or phases, and all three of these phases can be found somewhere on the earth. What do we call water when it’s a solid? Take responses—ice. At your table, name two places you can find ice on the earth. (Snow, glaciers, frozen tundra, frozen lakes, etc.) Did anyone also say icebergs?

What do we call water when it’s a liquid? Take responses—water. At your table, name two places you can find liquid water on the earth. (Rivers, lakes, streams, etc.) Did anyone also say plants?

What do we call water when it’s a gas? Take responses—steam or water vapor. Again, at your table, name two places you can find steam on the earth. (Geysers, hot springs, fog, clouds, etc.) Did anyone also say your breath?

There is another unique quality of water that God has created. Usually, any substance will contract and get smaller as it freezes, turning from a liquid to a solid. Water does just the opposite.

To show you this, let’s examine the container of water we froze yesterday. Remember, we filled the glass to the rim. If you look closely, you will see the ice level is higher than the level we marked yesterday. Have a volunteer walk around to groups showing the frozen ice container. Mark where the ice level is and then allow it to melt during class and check the level again. This demonstration shows that water expands when it freezes and takes up more space.

Most substances contract and take up less space when they freeze. So this means that when water freezes it gets less dense rather than more dense. Most substances get more dense when they freeze. Density explains why something floats or sinks.

We are going to do a challenge with ice. At your table is a 2-liter bottle with ice at the bottom. You have another
2-liter bottle filled with water. Your challenge is to see if you can cover the ice cubes totally with water. Give time for children to attempt the challenge. You should have found you couldn’t do it. No matter how much water you poured into the bottle with the ice cubes, the ice couldn’t be completely covered. Ice will float and always extend above the surface of the water because it’s less dense.

Think about this idea. If water didn’t expand and become less dense as it froze into ice, terrible things could happen on the earth. Ice would sink in lakes and oceans. It would crush plants and animals living on the bottom. As the water continued to freeze from the bottom up, other water plants and animals would also freeze and die. Fish and mammals would have shallower and shallower water in which to swim. Finally, they would get frozen into the ice as water eventually froze at the surface. The entire lake or river would be solid ice. Look at the sample pictures of what this might look like. Show Frozen Lake Pictures: pictures that show stages of a lake freezing from the bottom up. Give a minute for observation and discussion at tables.

Aren’t we thankful to God that He created water to expand and float as it freezes?

Water has many more unique qualities, such as the power of cohesion. Cohesion makes water molecules act like mini magnets. Water molecules are attracted to other water molecules and stick together.

Let’s observe cohesion in action. Using your eyedroppers, put two small drops of water near each other on your piece of wax paper. Tap the wax paper to get the drops near each other. Observe what happens as the drops get closer and closer, almost touching each other. Allow time to explore and observe. Now take your toothpick and try to break the big water drop apart. Share with others at your table what you observed. Give a few more moments for them to attempt this. Raise your hand if you saw your drops come together like a magnet was pulling them. You just observed water’s property of cohesion that makes droplets stick together. It’s a kind of electric attraction between the molecules of water.

Today, we’ve talked about many examples where water is truly a unique substance. We’ve seen that water exists in all three phases on the earth—solid, liquid, and gas. We’ve seen that water expands when it freezes and becomes less dense. Finally, we’ve observed the power of cohesion that helps water molecules stick and flow together. Only God can create such a unique liquid and give it as a special gift to the earth!