*Atmosphere Activity Bag*

# Cycling of Water: Student Activity Guide

The last time it rained, where did that water come from? If you said a cloud, you are correct, but how did the water get into the cloud? Water is always moving from the land, seas, lakes, and rivers into the air, and back again. It's called the water cycle. This activity explores how water moves in the water cycle.

## Materials From The Bag

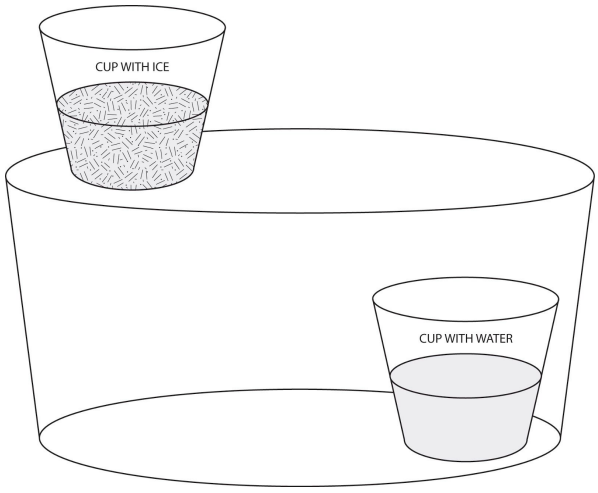
- Hinged Deli Container
- 5 - 1 oz. Small Cups
- Medicine Cup
- Black Construction Paper

## Preparation

1. Fill a 1 oz. cup with water and freeze it.
2. Do this activity on a clear day when the sun is shining.

## Part 1: Water Moves

1. Use your medicine cup to pour 10ml of room temperature water into the 1 oz. cup.
2. Place the cup inside the container at one end, as shown in the diagram.
3. Seal the container.
4. Place the frozen cup of water on the lid at the other end of the container as shown.
5. Place the container near a window or outside where the sun shines on it. Observe the container after 10 minutes. Record your observations over the next couple of hours. Record observations at four different times. At the end, sketch and label your container.
   *Where do you think the water inside the container lid and under the ice cube came from? How do you think it got there?*




**Rinse and dry the cups and container to use for Part 2.**

### *What's happening...*

The sun's heat caused the water in the cup to evaporate. The evaporated water became water vapor, a gas that moved around freely inside the container. The water vapor right below the ice cooled and became water again. That process is called condensation. This whole chain of events is an example of the water cycle.

## Part 2: Challenge

Using the set-up from Part 1, and running it until the ice melts, move the most water you can out of the cup. The inside of the container must remain unchanged. You may only change the outside with black construction paper and/or extra ice. If you want to make more ice, use the additional small cups.

1. Design your set-up.
2. Predict what you think will happen.
3. Build your set-up and allow it to run until the ice melts.

4. After your set-up has run until the ice melts, remove any materials around it. **If you move the set-up, do it carefully so you do not tip over the cup inside.**
5. At the end, sketch and label your container.

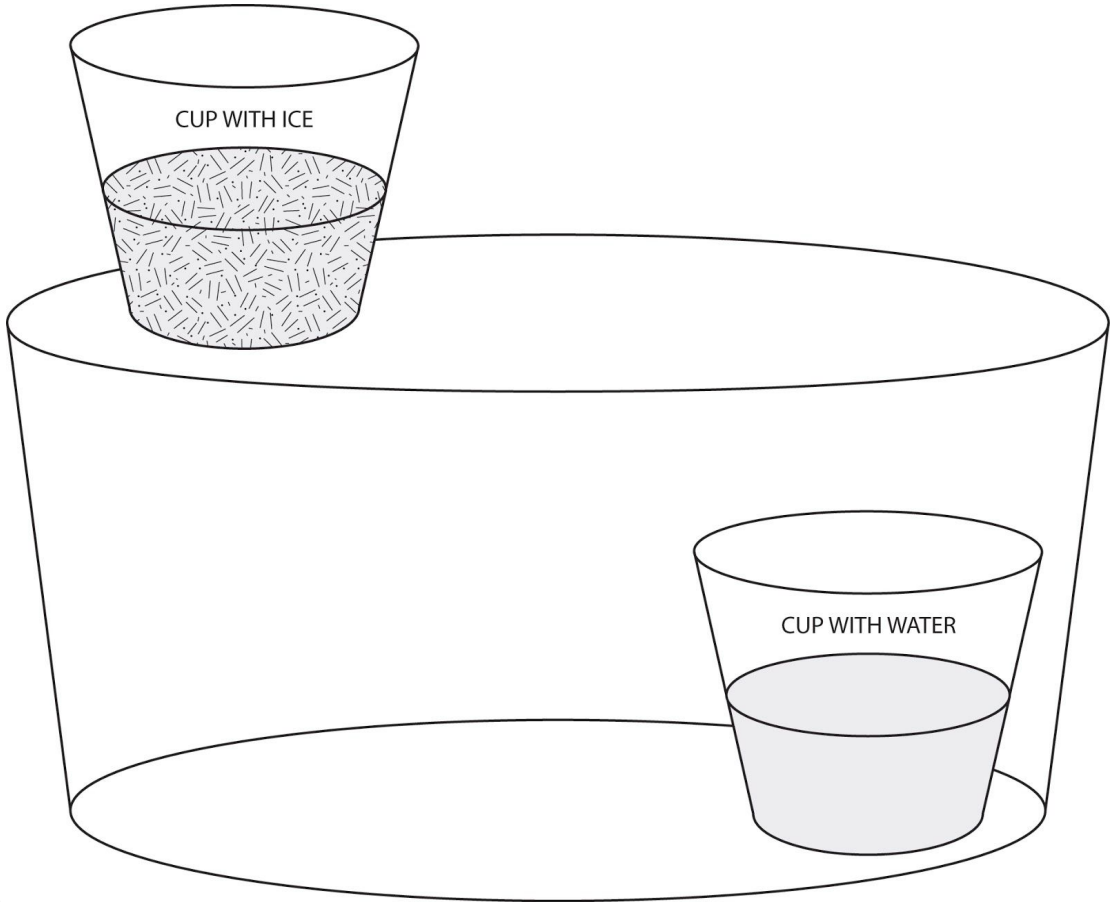
*What do you notice? Compare your observations to the observations in Part 1. What evidence do you have that your design was able to move more water? What about your design helped move more water?*

## Part 3: Model the Atmosphere

Look at the diagram below, and consider that this is a model of water in the atmosphere. Label the following:

1. The coldest air inside the container
2. The boundary between the coldest and warmest air inside the container
3. The places where there is the most and least water vapor in the air
4. Use arrows to indicate the direction of water vapor movement inside the container
5. Something that would be like clouds or rain.

Using arrows, draw how you think air is moving inside the container. Include the area where the air is falling and where the air is rising

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### What's happening...

Air that is full of water vapor is called a low-pressure area, and it rises. Air, where water vapor has condensed and turned to water, contains less water vapor. That's because the water vapor became rain or snow and fell out. That air is called a high-pressure area. High-pressure air falls toward the ground. Based on this information, label areas of high and low pressure in your model.