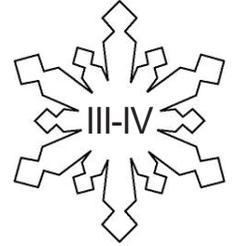


Water Cycle Bag

Levels



Grades 5-8

Overview:

During this activity, students will witness evaporation, condensation and precipitation by enclosing water in an airtight bag and leaving it in a warm area.

Objectives:

The student will:

- research the water cycle;
- construct a model water cycle;
- recognize that water changes from one state to another; and
- learn the stages of the water cycle.

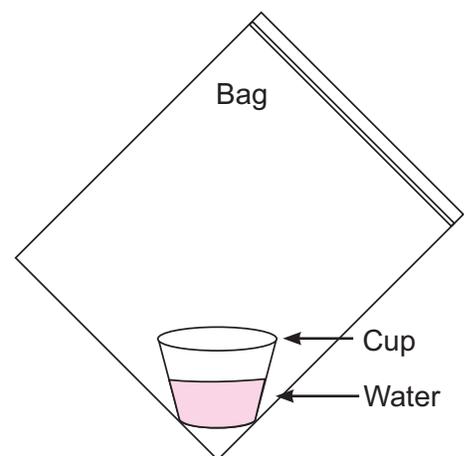
GLEs Addressed:

Science

- [5-8] SA1.1 The student demonstrates an understanding of the processes of science by asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating.
- [6] SA1.2 The student demonstrates an understanding of the processes of science by collaborating to design and conduct simple repeatable investigations.
- [7] SA1.2 The student demonstrates an understanding of the processes of science by collaborating to design and conduct simple repeatable investigations, in order to record, analyze (i.e., range, mean, median, mode), interpret data, and present findings.
- [8] SA1.2 The student demonstrates an understanding of the processes of science by collaborating to design and conduct repeatable investigations, in order to record, analyze (i.e., range, mean, media, mode), interpret data and present findings.
- [6] SD1.2 The student demonstrates an understanding of geochemical cycles by identifying the physical properties of water within the stages of the water cycle.
- [6] SD3.1 The student demonstrates an understanding of cycles influences by energy from the sun and by Earth's position and motion in our solar system by connecting the water cycle to weather phenomena.

Materials:

- Gallon-size resealable plastic bags (one per student)
- Permanent markers (5 per class)
- Clear plastic Dixie cups (one per student)
- Water
- Pitcher
- Red food coloring (1 bottle)
- Duct tape (1 roll)
- Global Climate Change CD-ROM
- STUDENT LAB PACKETS: "Water Cycle Bag"



Activity Preparation:

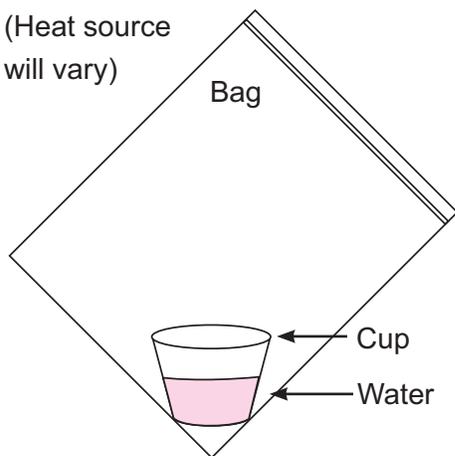
Fill a pitcher with water, add several drops of red food coloring, and stir. Water should be noticeably pink.

Activity Procedure:

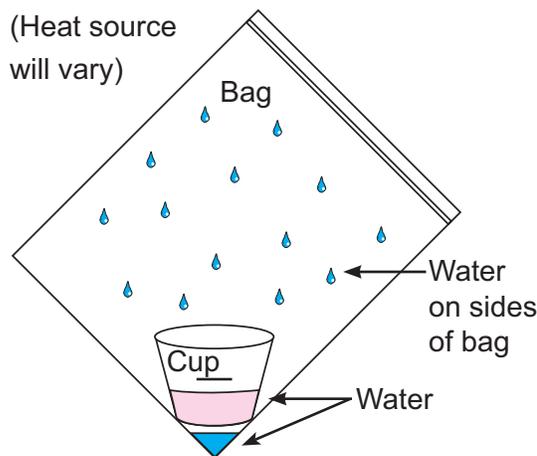
1. **Day one:** Build a water cycle bag (see steps 4-6) in front of the students and ask them what will happen to the water in the cup if the bag is left in the sun or near a heater vent. Students may know that the water will evaporate. Point out that the cup is sealed inside the bag. Ask students where the water vapor will go. Facilitate discussion of student hypotheses.
2. Distribute the STUDENT LAB PACKETS. Provide students with an opportunity to research the water cycle on the Global Climate Change CD-ROM, or other materials in the classroom or library to help them develop a hypothesis. Ask students to complete the hypothesis portion of their lab packet.
3. Distribute supplies and ask students to build their own water cycle bags. Make sure students write their names on the bags with permanent markers before placing the cup of water into the bag.
4. Ask students to fill a clear plastic cup half full with colored water from the pitcher, and mark the level of the water in the cup (with a marker on the side of the cup). The cups of water represent oceans, rivers and lakes.
5. Ask students to place the cup in the bag, taking care not to spill the water into the bag. Demonstrate how to hold the bag by one corner so the cup nests into the bottom corner of the bag. The bag represents the atmosphere and air.
6. Ask students to seal the bag, leaving some air inside the bag.
7. Using a piece of duct tape about three inches long, ask students to affix their bags to a south-facing window (or near a heat source) with the cup nested upright in the lowest corner. Leave the bag overnight. Ask students to complete question #1 in the Data section of their lab packets.
8. **Day two:** Some water from the cup should evaporate and condense on the bag, and will then roll down and pool in the bottom of the bag. Look to see if the level of water in the cups is lower. The water on the sides and in the bottom of the bag represents rain.
9. Explain that the water from the cups (representing lakes, rivers, oceans) evaporates into the air in the bag and condenses on the bag (representing clouds). It then runs down inside the bag to the bottom of the bag (representing rain, snow or other precipitation).
10. Ask students to complete their lab packets.

Answers to Student Lab Packets:

1. (Heat source will vary)



2. (Heat source will vary)



3. On day 1, all the water was pink and in the cup. On day 2, some pink water remains in the cup, but there also is clear water in the bottom of the bag and on the sides of the bag.

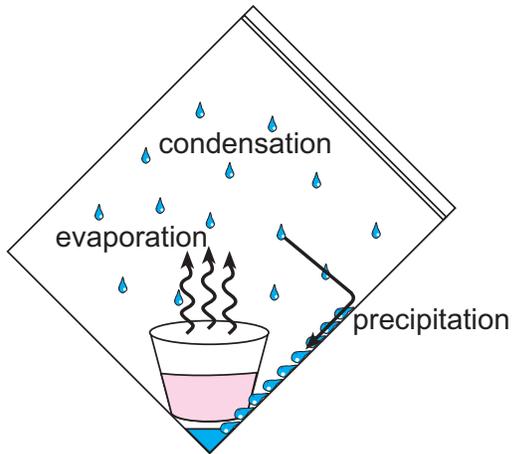
4. a.

5. d.

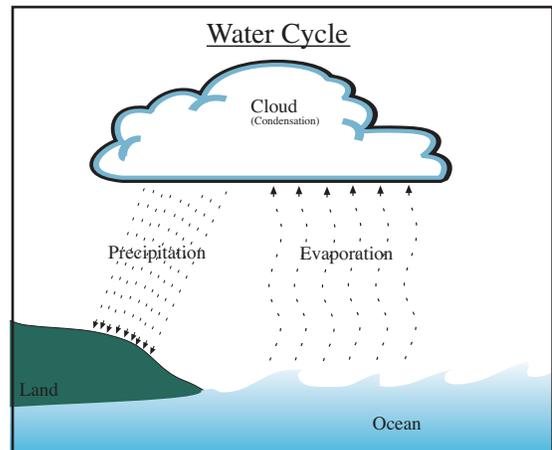
Conclusion/Explanation: evaporate into the air in the bag, then condense on the sides of the bag and run down into the bottom of the bag. Explanations will vary.

Further Questions:

1.



2.

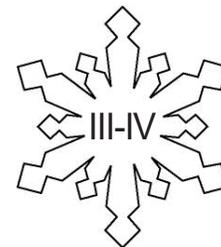


Name: _____

Water Cycle Bag

Student Lab Packet

Levels



Testable Question:

What will happen to water in a cup if the cup is placed inside a sealed bag in a warm area and left overnight?

Background Research:

Research Earth's water and the water (hydrologic) cycle on the Global Climate Change CD-ROM, or other resources in your classroom. Use what you learn to help you write your hypothesis.

Hypothesis:

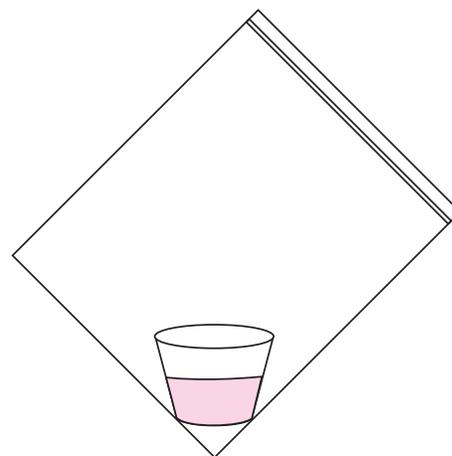
Complete the statement below:

If a cup of water is sealed inside a plastic bag and left overnight in a warm area, then the water in the cup will:

Experiment:

Materials:

- 1 gallon-size resealable plastic bag
- Permanent marker
- 1 clear cup
- Pink water
- Duct tape



Procedure:

1. Write your name on the bag with a permanent marker.
2. Fill a clear plastic cup half full with colored water from the pitcher, and mark the level of the water in the cup (with a marker on the side of the cup).
3. Place the cup in a bottom corner of the bag, being careful not to spill any water. Hold the bag by one corner so the cup nests into the bottom corner of the bag.
4. Next, seal the bag, making sure to leave some air inside.
5. Using a piece of duct tape about three inches long, affix the bag to a south-facing window with the cup nested upright in the lowest corner. Leave the bag in the sun until tomorrow.

Name: _____

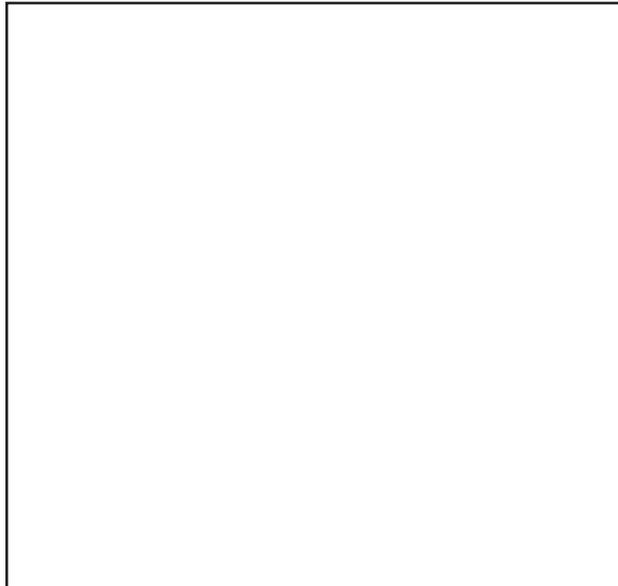
Water Cycle Bag

Student Lab Packet

Data:

1. Hang up your water cycle bag and draw a picture of it in the box labeled Day 1 below. Label the bag, cup, water and heat source on your drawing.

DAY 1:



2. Leave your water cycle bag hanging overnight, then draw a picture of it in the box labeled Day 2 below. Label the bag, cup, water and heat source on your drawing.

DAY 2:



Name: _____

Water Cycle Bag

Student Lab Packet

Analysis of Data:

3. What differences do you see between your drawing for Day 1 and your drawing for Day 2? Look at the location and color of the water.

4. Where is the water located on Day 1?

- a. In the cup
- b. In bottom of the bag
- c. On the sides of the bag
- d. All of the above

5. Where is the water located on Day 2?

- a. In the cup
- b. In bottom of the bag
- c. On the sides of the bag
- d. All of the above

Conclusion:

If a cup of water is sealed inside a plastic bag and left overnight in a warm area, then the water in the cup will:

Explain how you reached this conclusion.

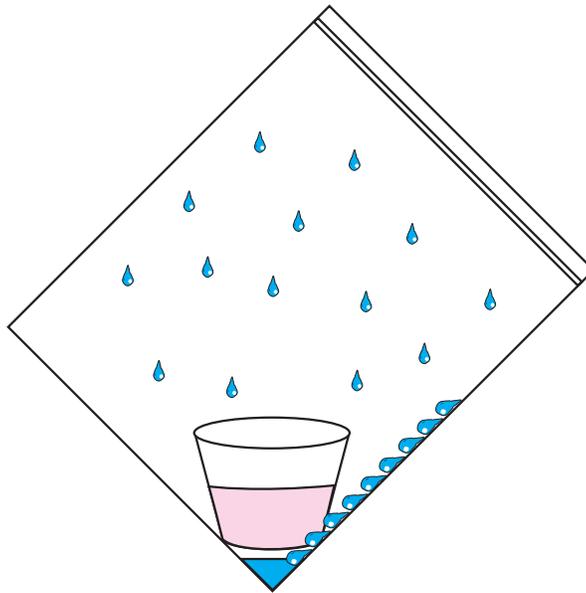
Name: _____

Water Cycle Bag

Student Lab Packet

Further Questions:

1. Draw arrows to indicate the path of the water in the water cycle bag below. Label evaporation, condensation and precipitation in this model of the water cycle.



2. Draw arrows to indicate the path of water in the picture below. Label evaporation, condensation and precipitation on this drawing of Earth's water cycle.

