



Water Cycles!

Lesson Concept	Water on Earth cycles through 4 stages: accumulation, evaporation, condensation, precipitation
Link	In the previous lesson students learned about the presence of water on the Earth and the amount of non-usable and usable water. In this lesson, they learn that the water on Earth has been here “since the beginning,” moving through a cycle of accumulation, evaporation, condensation and precipitation. They create a water cycle in a bag to model the cycle. In the next lesson, students will learn about the process of transpiration as a way in which plants contribute to the water cycle.
Time	Day 1: 35 minutes Day 2: 10 minutes Day 3: 30 minutes
Materials	<u>Whole class</u> Video: http://teacher.scholastic.com/activities/studyjams/water_cycle/ Window space for baggies Pitcher of “red” water Red food coloring <u>Per Partners</u> Quart-size Ziploc bag Small clear plastic condiment cup “Red” water Tape Permanent marker <u>Individual</u> Science Notebook Index card for exit slip

Advance preparation

1. Gather materials including access for video. If the video is not available, use other resources for student to read or observe the water cycle.
2. Place a few drops of red food coloring into a pitcher of water to turn the water pink.

Procedure:

Engage (10 minutes) Water cycles on the Earth

1. Write the words “water cycle” on the board and ask partner groups to brainstorm as many things as they can about the water cycle.
2. Have partners share their ideas. Chart as they share, and then summarize what the class knows about the water cycle.

Explore #1 (10 minutes) Water cycles through phases: accumulation, evaporation, condensation, precipitation.

3. Hold up a glass of water and ask students how old they think it is. Chart their ideas. Save for the Evaluate stage.
4. Ask students to divide a page in their notebook into 4 quarters. Explain that they might want to use these dividers to record notes from the video.
5. Play the video (http://teacher.scholastic.com/activities/studyjams/water_cycle) for students and ask them to take notes in their science notebooks, paying attention to the path that water travels and how the water changes.
6. At the conclusion of the video, ask partners to share their notes and compare them to the class chart. Discuss any differences.
7. Ask students what types of physical change does the water go through (e.g., liquid water, water vapor (gas), solid water (snow),
8. Ask students what drives the water cycle? (the sun’s energy)

Teacher Note: This lesson is an introduction to the stages of the water cycle. In lesson 5.6 students will explore how living things contribute to the cycle and in lesson 5.7 they will explore the amount of time it takes for water to cycle.

Explore #2 (15 minute set up; follow up 10 minutes over the next 2 days) The sun’s energy drives the water cycle.

Teacher Note: The mini water cycle bag works best on south facing windows, on warm sunny days.

If you would like to introduce a “variable”, consider putting the bags in different windows with different sun exposure and then debrief how the amount of sun impacted the cycle.

9. Explain that students will have an opportunity to build a model of the water cycle to better understand the phases, the path that the water follows, and the changes in the physical characteristics of the water.
10. Build a water cycle bag in front of the students:
 - a. Use a permanent marker to write your name on the baggie.
 - b. Fill a clear plastic cup half full with colored water from the pitcher, and mark the level of the water on the outside of the cup
 - c. Ask students: what does the cup represent?
 - d. Hold the bag at a tilt and carefully place the cup in bottom corner of the bag
 - e. Seal the bag with leaving air inside.
 - f. Ask students: what does the air represent?
 - g. Tape the bag to the window with the cup nested upright in the lowest corner.
11. Ask students to predict what will happen to the water in the cup if the bag is left in this position of a couple of days. Ask students to write their prediction in their science notebook.
12. Distribute supplies and ask partners to build their water cycle bag.
13. Ask partner groups to tape their bag to the window and have them sketch and label their setup their science notebook.
14. Explain that students will observe and record their observations over the next 2-3 days.

Teacher Note: Over the next 2-3 days, have students make and record their observations. On each day, conduct a brief discussion of their observations. On the first day, students should notice that some of the water evaporated and has condensed as water droplets inside the bag. On the second day, the water level may be different if it "rained" back into the cup. Use Steps 11-15 to guide the learning.

15. On the next morning, have partners observe their baggies, and record their observation with a labeled drawing in their notebook. What did they notice in general? What did they notice about the water level in the cup? What was occurring? Why? What color were the water droplets?
16. Discuss the process they observed: Where is evidence of accumulation? Evaporation? Condensation? Precipitation?
17. On day 3 have partners observe their baggies again and record their observation with a labeled drawing in their notebook. Discuss how this drawing is the same or different from day 1 and day 2.

Explain (10 minutes) *The sun's energy drives the water cycle through phases: accumulation, evaporation, condensation, precipitation.*

18. Have students label the Day 3 drawing using the stages of the water cycle and arrows to indicate the path of the water.
19. Ask them to summarize the water cycle process including the role of the sun and the path and changes to the states of water (e.g., liquid, solid, gas).

Evaluate **(10 minutes) Water continues to cycle throughout time**

20. Hold up the glass of water from the Explore Stage again. Ask students to use what they've learned so to do answer this prompt: How old is this water? Why?
Ask students to write their response on an exit card.

Water Cycle in Bag Setup

