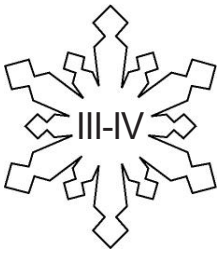
Local Hydrologic Cycle

Levels



Grades 5-8

Overview:

The hydrologic (water) cycle is visible in many aspects of our environment. In this activity, students will identify the stages of the hydrologic cycle on a photograph or drawing of their community.

Objectives:

The student will:

- understand the stages of the water cycle; and
- relate the water cycle to their local environment.

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] SD1.2 The student demonstrates an understanding of geochemical cycles by identifying the physical properties of water within the stages of the water cycle.

Materials:

- 2 ice cube trays (or small freezer-safe containter)
- Clear container
- Water
- Dirt (or other loosely packed substance such as sifted flour)
- OVERHEAD: “Water Cycle”

AND

- photograph of local community in summer AND in winter

OR

- white construction paper
- crayons and/or colored pencils and/or colored pens

Activity Preparation:

1. One week prior to this activity fill ice cube trays with water and place them in the freezer.
2. One day prior to this activity, place another set of ice cube trays in the freezer. Make sure that the same amount of water is added to the trays each time.
3. For this activity, students can label either copied photographs or pictures that they draw of their local community. If using photographs, locate one in winter and one in summer that shows plants, clouds, and one source of water (lake, river, snow, etc.).

Activity Procedure:

1. Remind students that the water cycle, otherwise known as the hydrologic cycle, is the circulation of water throughout Earth. Remind students about the “Water Cycle Bag” lesson and how the water formed vapor, condensed, and then precipitated. Explain that in that activity, students saw three of the stages of the water cycle.
2. Explain that the water cycle has several more stages. Show OVERHEAD: “Water Cycle.”

3. Remind students that evaporation is when water becomes vapor; condensation is when water condenses into clouds; and precipitation is when water falls back to Earth in the form of rain, snow, sleet, hail, etc.
4. The other stages of the water cycle are sublimation and infiltration. As a class, ask students to speculate and discuss the meaning of the words sublimation and infiltration. Explain that sublimation is when solid water (ice or snow) changes directly to vapor. Ask students which ice cube tray would have more ice in it: one in the freezer one week ago or one put in the freezer yesterday.
5. Ask students to explain the difference between speculation and observation. Discuss.
6. Remove the frozen ice cube trays from the freezer and display to students. Explain the same amount of water was placed in both trays. One tray was put in the freezer yesterday; the other one week ago. Students should see that the one placed in the freezer one week ago has less ice in it. Explain this demonstrates sublimation. The ice changed into vapor without first changing into liquid, as it would do if heat were applied.
7. Explain seeing ice was an observation; one could see how one tray of ice cubes had less ice than the other tray. The class discussion regarding the ice cube tray was speculation, as there was no observable evidence.
8. Explain that infiltration is the downward movement of water through soil. In the hydrologic cycle, infiltration is when water from rain, rivers, lakes, etc. seeps into the ground. Some of this water pools and becomes groundwater, which is where people get water from when they dig a well. Eventually, some of this water seeps back to the surface in the form of a spring. This can be seen at small and large springs, such as Chena Hot Springs in Fairbanks.
9. Explain that infiltration is possible because soil is not a solid mass; there are pockets of air through which water can move. Demonstrate by pouring water slowly over the clear container filled with dirt. Students should be able to see the water pool into the bottom of the container.
10. Hand out the copied photographs or supplies to draw. If students are to draw, instruct them to draw a picture of their community in winter or a picture of their community in summer. The pictures should include all the elements of the hydrologic cycle that are present during that season.
11. If students are to label the photographs only, then instruct them to do so. For either method, students should label each stage of the hydrological cycle and the physical state of water at each stage. Students may complete this activity individually or in pairs.

Critical Thinking Question: The One-Minute Paper Method. Check student progress and understanding by asking students to “write 3 things of the hydrologic cycle that are observable and 3 things that are speculation.” Give the class one minute to write down any ideas or knowledge they have on the topic.

Answers:

Answers will vary.

Water Cycle
Overhead