

The Rain Maker

Description

In this activity, students create a model of the water cycle in a closed system using a resealable plastic bag.

Time Frame

1 lesson (45 minutes) and 2–3 days of additional observations

Correlation to Texas Essential Knowledge and Skills

During this activity, students will be exposed to the following Texas Essential Knowledge and Skills:

Note: Some TEKS statements below end with a ; or *and* and nothing thereafter—this indicates that further TEKS statements follow but are not included here.

(2.10) Science concepts. The student knows that the natural world includes rocks, soil, water, and gases of the atmosphere. The student is expected to:

- (A) describe and illustrate the water cycle; and

Note: The TEKS listed here are the main content TEKS for this activity; however, this activity may also cover additional content and process skills included in other TEKS.

Materials

Tape
Sunny area to hang bags
Black paper to aid in viewing
1-gallon resealable plastic bags (1 per student group)
1/4 cup small gravel per student group
1/4 cup sand per student group
1/2 cup water per student group
Clothes hanger (1 per student group), optional
Clothes pins, optional
Water journal
Water Rhyme (included at the end of this activity)

Background Information for the Teacher

Approximately 71% of the earth is covered by water. Water evaporates when energy is added and condenses when energy is lost. The loss of energy causes the water to cool. Small drops of condensed water suspended in the air can become enlarged as the droplets come together. When they become too heavy, the water precipitates (falls from the air).

Evaporation, condensation, and precipitation that occur in the water cycle are abstract concepts. Because water vapor is an invisible gas, teachers and students may use the terms, but in this activity the purpose is to observe and describe the processes rather than to explain how or why it occurs.

Advance Preparation

1. Create a water journal by stapling together several sheets of paper for each student.
2. Write the lines of the Water Rhyme on the board or overhead transparency.

Procedures

1. Divide the class into small groups and give each group the cups of sand, gravel, water, and a resealable plastic bag. Have the student groups layer the gravel, sand, and water, respectively, in the bag. Seal the bag, making sure air is trapped inside.
2. Have students draw a picture of the bag in their water journals.
3. Discuss where the bag should be placed. Guide students to realize that placing the bags in a sunny location best imitates natural (outdoor) conditions. Hang the bags at an appropriate level so students can make observations.

Note: To securely hang the bags, you may try taping to windows, stapling to a bulletin board, or pinning to a clothes line or clothes hangers. Make sure not to make holes in the bag anywhere below the seal.

4. Review lines 1–5 of the Water Rhyme.
5. Have groups check the bags daily for observable changes. If necessary, hold a piece of black paper behind the bag for viewing ease.

Note: Do not lay the bag down or the changes will disappear.

6. Have the class observe and describe any changes they notice. Discuss the locations of water in the bag (e.g., water above the sand, condensation droplets near the seal of the bag, etc.). Have students record changes to the drawing in their water journals, paying particular attention to identify places on the drawing that show changes in water. Read lines 6 and 7 of the Water Rhyme: “Water, water, circle away, come as rain another day. Water, water, reappear, keep the circle going here.”
7. Discuss the concepts of evaporation, condensation, and precipitation, using real-life examples such as fogged bathroom mirrors when a hot shower is run, and water beads on the outside of a cup of ice water. Discuss the source of the water at the top of the bag. Relate the changes in the sealed bag to the examples just discussed. Review the entire Water Rhyme.
8. Have students go back to their drawings in their water journals. They should draw two arrows to show the change in location of water from (1) the bottom

of the bag to the top and (2) from the top, down the sides, to the bottom. Discuss the circular pattern of water movement called the water cycle. Relate the water cycle to the wheels of a bicycle so that students realize it is a continuous flow with no real beginning or end. Life cycles may also be discussed.

9. Check the drawings to ascertain that two arrows indicate the circular movement of water.
10. In their water journals, students should describe the water cycle.

Water Rhyme

(Sung to the tune of Rain, Rain, Go Away)

1. Water, water, will you stay or find a way to go away?
2. Water, water, went away, found a place to hide away.
3. Water, water, hide away, collect as droplets where you stay.
4. Water, water, droplets play, become clouds without delay.
5. Water, water, clouds are growing, now we find your rain is showing.
6. Water, water, circle away, come as rain another day.
7. Water, water, reappear, keep the circle going here.