DESERT HOT, DESERT DRY *EVAPORATION IN ACTION*

*A series of activities to introduce desert aridity and evaporation.**

Arizona Science Standards

SC00-S1C1-02,
SC00-S1C3-01,
SC01-S1C1-02,
SC02-S1C1-01

Objectives

Students should:

- Call upon their own knowledge of the place they live to define the characteristics of deserts.
- Conduct experiments that demonstrate properties of evaporation.

Materials

- a transparent container at least 12" deep, filled with water
- paper towels
- bucket filled with water, or an outdoor drinking fountain
- stopwatch

Vocabulary

- **Desert** - an area low in moisture for most of the year. Evaporation of free water and transpiration of water through plants can be greater than annual rainfall.
- **Evaporation** - changing from a liquid to a gas

Getting Ready

Prepare the materials as listed in the left margin of this page.

Doing the Activity

Setting the Stage

1) Pose the question "What makes a desert a desert?" to your students. They will likely list hot and dry as two predominant characteristics. If not, ask pointed questions like "Does it rain very much in the desert?" "Is it hot or cold?"
2) Explain that there are deserts throughout the world, and some are hotter than others. But the thing they all have in common is that they are dry. They do not get much rain (or snow) and it does not come evenly throughout the year.
3) Ask your students if they can remember the last time it rained. Show them the clear container filled with 12 inches of water and explain that the amount of rain Tucson gets in a year would cover the ground this deeply all over if the water did not disappear. Ask, "Where does the water go when it rains?" (Plants and animals use it, the ground absorbs it, and something else happens.)

Demonstration

1) Dip a paper towel in the container of water and wipe it across a chalkboard, explaining that this water is like rain in the desert.
2) Wait until a few dry patches show up, then ask, "What happened to the water?" (It changed from a liquid into a gas called water vapor.) We can't see it, but it went into the air. Because it is sunny and dry in the desert, the air acts like a giant sponge and absorbs any moisture that it can from the ground, surface water, and living things. Water seems to disappear. This is called **evaporation**.
3) Ask the students if they can think of any other things water evaporates from? (Pavement, wet clothes on a line, etc.) Tell the students that you will all be going outside to do an experiment to learn more about evaporation.

Experiment

1) Bring out the bucket of water or assemble the group at a drinking fountain near a sidewalk (or blacktop) partly in sun and partly in shade.
2) Give each child a paper towel to ball up and dampen in the bucket or at the drinking fountain, and have them write their initials on the sunny sidewalk with it. Time how long it takes for the initials to disappear. Then do the same on the shady sidewalk.
3) Ask the students, "In which area did the water evaporate more quickly?" (The sunny side.) "Why?" (The sunny side is hotter, and hot air is able to take up more moisture than cooler air. Heat speeds up evaporation.)

Discussion

1) Discuss their findings as a group. Ask, "Do you think evaporation happens a lot or a little in the desert?" "Why?" (They should conclude that evaporation rates are high in the desert because it is sunny and hot.) Again ask, "What makes a desert a desert?" (This time they should state that it is hot, dry, and there is a lot of evaporation.)
2) Conclude that what truly makes the desert a desert is this combination of low rainfall and high evaporation.