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EPA ENVIRONMENTAL EDUCATION

WATER PURIFICATION BY EVAPORATION AND CONDENSATION

GRADE LEVEL: 4 – 7

BACKGROUND: The following demonstration illustrates how the water cycle helps to purify water. The key terms are evaporation and condensation. Evaporation is defined as the process through which a liquid becomes a vapor. Condensation is the process through which a vapor becomes a liquid, and is the opposite of evaporation. In the case of water, the main mechanisms for evaporation and condensation are heating and cooling, respectively.

MATERIALS NEEDED:
4 cups of dirt or sand
a dozen stones
2 quarts of water
a large glass bowl with tall sides (mixing bowl)
a short glass
clear plastic wrap
a sunny day.

PROCEDURE: Mix the dirt (or sand) and water in a large bowl. Stand a clean and empty short glass in the center of the bowl. Place the bowl outside in the sun. Cover the bowl with the plastic wrap and weigh down the edges with the remaining rocks. Place one rock on the plastic wrap directly over the cup. Allow the bowl to remain in the sun for several hours. Look in the cup (it should contain some relatively clean water free of mud). Look in the bowl (it should contain the dried dirt).

FOLLOW-UP QUESTIONS:

1. What are the two processes responsible for purifying the water? (Evaporation and Condensation)

2. Where else do you see condensation? (Cold drink outside on a hot day)

3. How does this process work on Earth?

4. What is the plastic wrap? (Our atmosphere)

5. What is the condensation? (Clouds and rain)

6. What would happen if the plastic wrap was dirty? (Air pollution)

VARIATIONS: Add food coloring to water to demonstrate that this process does not remove all pollutants. This may be done simultaneously with the procedure above.