

ENERGY AND THE WATER CYCLE

Demonstration

Materials:

Lab 1 Report Sheet

6 salad bowls from a fast-food restaurant (dark bowl with clear plastic cover)

clean gravel (up to 3-cm diameter rocks)

rocks

water

sand

sea salt

soil

2 sponges

2 small bowls

brown paper towels

Procedure:

A. Preparation

Oceanside:

1. Pile rocks to make a mountain whose top is below the plastic cover.
2. Fill around the rocks with sand, leaving a part of the bowl's bottom bare.
3. Make saltwater by dissolving 2 teaspoon of sea salt per cup of water.
4. Pour in 1-2 cups of saltwater into to form an ocean that comes up to the sand.
5. Place the covers onto the bowls, making sure they are tightly sealed.
6. Set the bowls aside.

Lakeside:

1. Pile rocks to make a mountain whose top is below the plastic cover.
2. Place a small bowl into the bottom of the salad bowl near the mountain.
3. Fill around the rocks and bowl with soil, so that the bottom of the salad bowl is covered.
4. Pour fresh water into the small bowl until it is about $\frac{3}{4}$ full.
5. Place the covers onto the bowls, making sure they are tightly sealed.
6. Set the bowls aside.

Desert/Arid Region:

1. Pile gravel to make some hills whose tops are below the plastic cover.
2. Fill around the gravel with soil, so that the bottom of the salad bowl is covered.
3. Place a wet sponge on the soil.
4. Place the covers onto the bowls, making sure they are tightly sealed.
5. Set the bowls aside.

B. Performance:

1. Place one of each type of bowl in a cool, relatively dark location in the classroom. Leave them there together for two or three days.
2. Place the other of each type of bowl in the sunlight, or place them into the light produced by a lamp. Leave them there together for two or three days.
3. Observe each bowl each day, and have students record any changes they see on the Report Sheet. **DO NOT OPEN THE BOWLS.**
4. After two or three days, open the “Oceanside” Bowl. Dip a dark paper towel into the “ocean,” and, with a second dark paper towel, wipe part of the liquid off the inside of the lid. Lay the towels aside to dry.

OR

Have students taste the water in the “ocean” and taste the water on the lid.

5. Have students answer the questions on the Report Sheet.

LAB 1: Report Sheet

1. Why is it important to make sure all the bowls are completely sealed throughout the activity?

2. What differences, if any, did you note between the behaviors of the two groups of bowls?

3. What purpose does placing the models in the sunlight or under the lamp have?

4. Why did no water form on the inside of the lids of one of the groups?

5. Where did the water come from on the other group of lids?

6. Pictures of the water cycle always have a world-wide scope, showing the ocean. Is it possible to have a localized water cycle without an ocean?

7. How did the plastic lid act as the cold air in your “atmosphere”?

8. What do you think would happen if you covered the bottom of the container with small live plants and put the bowl in the sun? How could that change your interpretation of results?

9. What did you observe when you examined the two dark paper towels?

10. What can you conclude about the salt content in the two water samples on the towels?

11. Which of these models is most like the Texas Panhandle? Explain your answer.

12. Where is most of our surface water found?