



## APPENDIX B HUMIDITY

### OBJECTIVES

The students

- Make daily observations of humidity.
- Invent a humidity-measuring device.
- Make seasonal observations about humidity.
- Relate humidity to personal comfort.
- Create a working definition for humidity.

### BACKGROUND

The students begin the study of humidity in this activity. First they discover that water is found in air using cobalt chloride paper as a water indicator. Then the students invent humidity measuring devices by making a protective container for a piece of cobalt chloride paper. The cover may be a plastic bag with holes or a jar with holes in the lid. Recording of humidity data is best begun when the air is quite dry. This can be a challenge in tropical locations where the humidity is usually high. When the paper is blue, the air is dry (low humidity); when it is pink, the air is very humid (high humidity); and when it is light purple, the air is mildly humid. It may be necessary to dry a piece of cobalt chloride paper to show that the paper actually does turn blue in dry air. This can be done by placing the paper on a hot black asphalt or similar surface.

The students should suggest observations relating personal comfort and humidity.

### STUDENT ROLES

Inventor

Meteorologist

### MATERIALS

cobalt chloride paper

jar with lid

plastic bag

Working Dictionary

### PRODUCTS

Humidity measuring device

Humidity scale

Humidity data

## PROCEDURES

### 1. Review with the students what happens when water evaporates from a surface.

Ask such questions as these:

- Under what conditions will water leave a solution or something that is wet?  
✓Help the students recall that heat and sunlight speeds up the loss of water.
- Where does the water go?  
✓Work toward the idea that water goes into the air.
- What evidence do you have for the water being in the air?  
✓This may take some time to explore depending on the students' previous experience. They may recall that water was detected with cobalt chloride paper in the grade 3 activity 3.8 WATER CYCLE. If not, set up the water cycle model shown in Figure 1. Suspend a piece of (blue) cobalt chloride paper from a thread in the jar as shown.
- Has anyone heard the word **humid**? What do you think it means?  
✓Expect such ideas as a feeling of stickiness, when sweat collects on our body, when it's very hot and muggy in the summer.  
✓A concept map can be used here.
- Does anyone have a humidifier at home?  
✓This is not likely in the tropics! Skip these questions as appropriate.
- What does a humidifier do?  
✓Work to the idea that it puts moisture into the air.
- When is a humidifier used?  
✓Get at the idea that humidifiers are used when the air is too dry.
- Does anyone have a dehumidifier at home?
- What does a dehumidifier do?  
✓Work to the idea that it takes water out of the air.
- When do we use a dehumidifier?  
✓Get at the idea that dehumidifiers are used when the air is too humid.
- Does anyone have an idea about what causes uncomfortable humidity?  
✓Work to the idea that too much moisture gets into the air.
- How might we tell when there is a lot of moisture in the air?  
✓Get at the idea of using cobalt chloride paper.
- What color is the cobalt chloride paper when it is dry?  
✓Blue
- What color do you think cobalt chloride paper will be in dry air?
- What color is cobalt chloride paper when it is wet?  
✓Pink
- What color do you think cobalt chloride paper will be in very humid air?  
✓Pink
- What color is the cobalt chloride paper when something is slightly moist or damp?  
✓Purple
- What color do you think cobalt chloride paper will be in mildly humid air?  
✓Purple

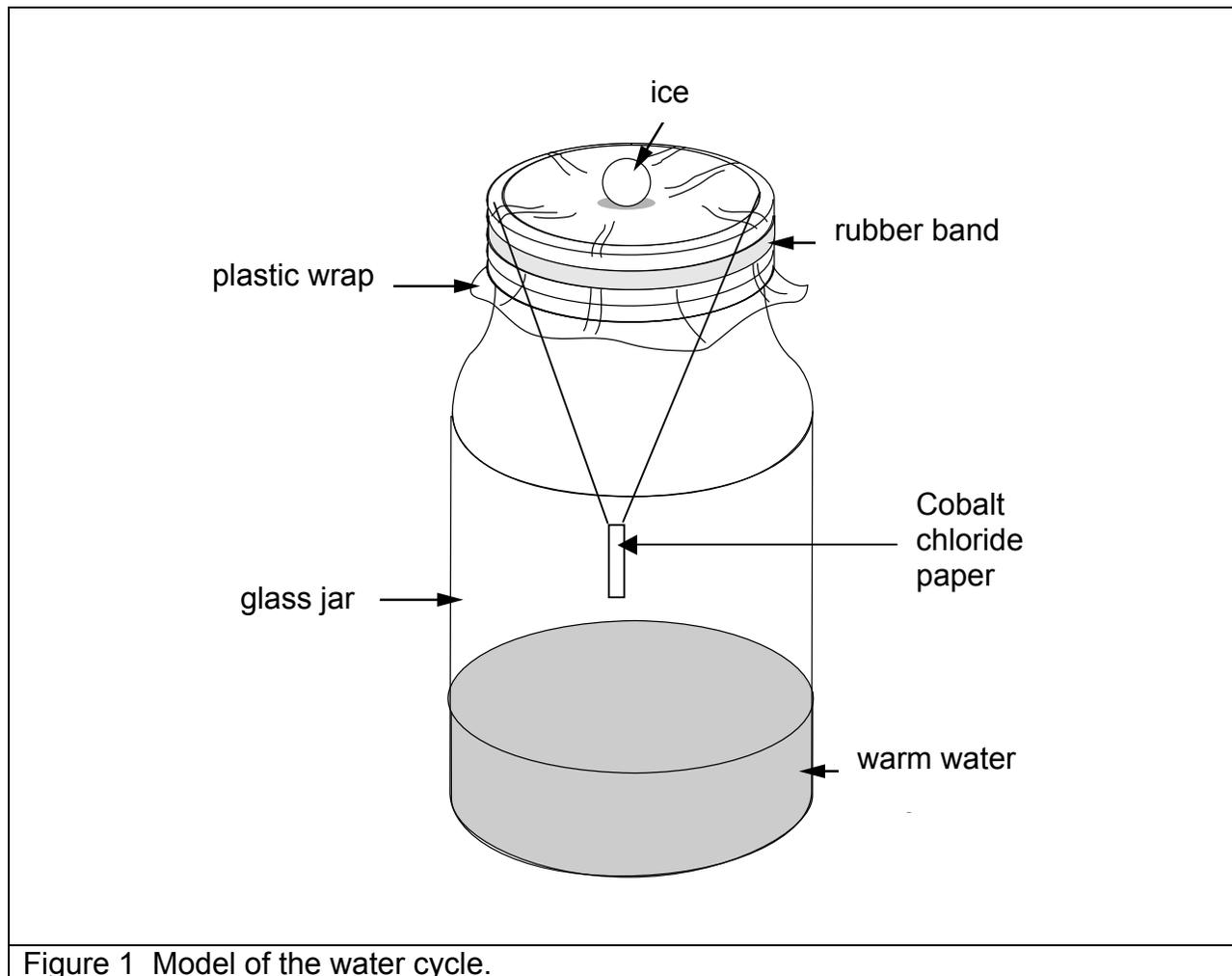


Figure 1 Model of the water cycle.

2. **Have student groups invent ways to protect a piece of cobalt chloride paper so that it can be carried outside and observed without touching it.**
3. **Discuss with the class how humidity measures are to be made.**  
 Ask such questions as these:
  - Where should you make your humidity measurements?
  - Should the measurements be made in the sun?  
 ✓This is a testable question, although logic suggests that the sun will probably dry out the paper.
  - How long should the cobalt chloride be allowed to stand before a reading of the color is made.  
 ✓This is also a testable question.
  - When should you take our measurements?  
 ✓This again is a testable question.

- Where should the humidity data be recorded?  
✓ There is a place for this on SP 4.1E DAILY RAIN DATA.
- How should the humidity data be recorded?  
✓ By the color of the cobalt chloride paper.  
Have the students make a Humidity Chart showing low (blue), mild (light purple), and high (pink) humidity readings. They should be able to get at least three readings—high, middle, and low, and, over time, five readings with the ranges between middle-low and middle-high identified. Post the chart in the Weather Center and add humidity data collection to the Responsibility Chart.

**4. During the monthly summary sessions have the students discuss their humidity data in relation to their comfort level.**

Ask such questions as these:

- What happens to your feeling of being comfortable as the humidity increases?
- Do people usually feel more uncomfortable at lower or higher temperatures when it mildly humid? When it is very humid?
- What months seem to have the least humidity?
- What months seem to be the most humid?

**5. Have the students create a working definition for humidity and record it in their Working Dictionary.**

### **EXTENSIONS**

- Have the students develop their own questions about humidity and research them.
- Have the students find out how humidity is reported in newspapers, TV reports, or on the Internet.
- Have the students report on how meteorologists measure humidity.