

# ASSESSMENT

## Student Assessment Questions/Answers

- 1 What did you observe on the outside of the can after you added the ice?
  - Water droplets (dew) formed on the outside of the can.
- 2 Why did the water condense to form dew on the can?
  - The ice cooled the can and the air around it. As the air cooled, water from the air condensed and formed dew.
- 3 When and where do you think dew is most likely to form?
  - Tiny droplets of dew often form at night on cold surfaces such as grass and leaves.
- 4 What did you observe on the outside of the can after you added the salt?
  - The dew turned into crystals of ice, known as frost.
- 5 Why do you think that frost formed on the outside of the can when salt was added?
  - Adding salt to the ice cooled the temperature to below freezing point ( $0^{\circ}\text{C}$ ).
- 6 When do you think frost is most likely to occur? What might keep frost from forming?
  - On clear, still nights when the temperature is below  $0^{\circ}\text{C}$ , water vapor can turn into solid crystals of frost. Frost occurs more often in valleys than in higher elevations because cold air is dense and flows down the valley slopes. Frost doesn't usually occur on cloudy nights when the clouds act as blankets trapping in heat.



# T E A C H E R S

## GUIDE



**MAKING DEW KIT**  
ITEM # 9447-15

## CHEMISTRY - PROPERTIES OF MATTER

The Making Dew Kit is a useful lab in showing students how both dew and frost are formed. The metal cans hold ice and salt and, over time, will create dew and frost on the outside of them. Through this activity, students will gain an understanding of how dew and frost form. They will also be introduced to the concepts of dew point, humidity, condensation, and sublimation.

# Materials

- 2 Making Dew Kits per small group
- Ice (crushed or cubed)
- Rock salt
- *Kits include: 15 metal cans and 15 metal backed thermometers.*

# Goals & Objectives

## Students will:

- explain that air contains water referred to as humidity, and that under cold conditions it may turn into dew or frost.
- be able to distinguish between dew and frost, and explain how each is formed.
- gain an understanding of the concepts of dew point, humidity, condensation, and sublimation

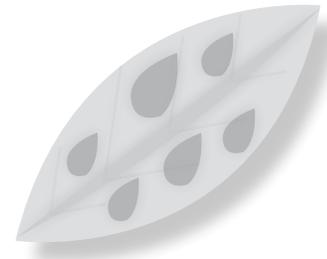
# DISCUSSION

## Enrichment Activities

- 1 Frost can harm plants and damage crops, costing farmers a lot of money. Research ways in which farmers try to combat frost.
- 2 Frost can sometimes cause what's known as a frost quake. Investigate what this is, and where it can occur. Prepare a report for the class on this topic.
- 3 Try making frost again only this time using different materials. Use a glass cup, a paper cup and an aluminum foil cup. See whether the frost appears at all, or if it took more or less time than on the metal can.

# ACTIVITIES

- 1 Begin by asking students to recall if they've ever noticed the grass being damp on some mornings even though it hasn't rained. Have them describe where they think this water may come from. Have them record their answers in their science journals. Discuss with students that all air contains water vapor, and scientists call this humidity.



- 5 Ask students to describe what happened in the first can with just ice. Note that small water droplets formed on the outside of the can when the ice lowered the temperature enough to turn water vapor into liquid (dew). This is called condensation. Explain to students that the temperature recorded when water droplets started to form on the outside of the can is called dew point.

## Note

It is always best to DO an experiment ahead of time to be able to best present it to the class.



- 2 Distribute two Making Dew kits to each student or small group. Have students place the thermometers in the cans and fill each can half full of ice. Have students record the starting temperatures of each can.
- 3 Add two teaspoons of salt to the ice in one of the cans. Gently swirl the contents in the can a few times before setting it down.
- 4 Wait 10 minutes and observe what happens to the outsides of each can. Have students record the new temperatures.

- 6 Ask students what happened to the second can with ice and salt. Note that the moisture in the air turned directly from a gas into a solid (frost). Explain to students that this is called sublimation.
- 7 Have students answer the assessment questions in their science journal. (*Assessment Questions and Answers on page 4*)