

## Cloud Maker



A dairy cow must drink 3536 gallons of water to produce 12 gallons of milk.

### Materials/Equipment

Clear, empty glass  
freezer

### Procedure

1. Put a dry, empty, clear glass into the freezer, leaving it in place for a least 15 minutes.
2. Remove the glass from the freezer with an insulated mitt and breathe gently into it.
3. Ask participants what produced the cloud, and lead them to conclude that it is formed by water vapor in the warm breath coming in contact with the cold glass surfaces.
4. Ask them if this is similar to the way clouds form in the sky? If necessary remind them that temperatures at higher altitudes can be considerable below zero ( on either scale) even when the surface temperatures are uncomfortably warm.

### Alternative:

A less demanding approach works well during cold weather. Have the participants breathe normally in a warm room to see if they can observe water vapor in their breath. Then move outside in a relatively still area. Have the participants breathe again, observing the puffs of condensation formed as they do so. Follow the same logic to the conclusion that the saturated air at body temperature contains more water vapor than the colder air can hold. The excess condenses to form the cloudlike plumes of visible “breath.”