

OBJECTIVES

1. Understand the properties of Carbon dioxide as a solid and a gas
2. Understand and demonstrate the process of sublimation

PRECAUTIONS: Please read information sheet on precautions of handling dry ice.



EXPERIMENT 1: DRY ICE TURNING INTO A GAS

WHAT YOU NEED

- Styrofoam cup
- Chunk of dry ice
- Water
- Gladwrap
- Rubber band
- Candle
- Match

WHAT TO DO

1. Using metal tongs or appropriate material gloves to place a chunk of dry ice into the cup.
2. Place gladwrap over the top of the cup securing tightly with a rubber band.
3. Observe what happens.
4. Now take off the gladwrap for a moment and add ~ 2 tablespoons of water. If the gladwrap is broken use another piece of gladwrap.
5. Replace the gladwrap and tightly seal with the rubber band.
6. Observe what happens.
7. Now light the candle
8. **Carefully** pour the air from your cup onto the flame. Do not let any dry ice fall out.
9. Observe what happens.

QUESTIONS

1. What happened to the gladwrap when you covered the cup with it?
2. Can you explain why this happened?
3. What happened when you added water to the cup?
4. Do you think dry ice is a good name for this material? Why/why not?

EXPERIMENT 2: FLOATING BUBBLES

WHAT YOU NEED

- Dry Ice
- Gloves, tongs
- Bubble solution and wand
- Ice cream container

DRY ICE EXPERIMENTS

WHAT TO DO

1. Using gloves and tongs, place some dry ice into a rectangular container.
2. Blow bubbles on top on the dry ice and observe what happens.

EXPERIMENT 3: BUBBLING OVER

WHAT YOU NEED

- Dry Ice
- Gloves, tongs
- Tall glass or plastic cylinder
- Liquid detergent 5-10mL
- Food colouring
- Warm water

WHAT TO DO

1. Fill the tall cylinder with warm water and add ~5-10mL of liquid detergent and your choice of food colouring.
2. Using gloves or tongs place pellets of dry ice into the plastic cylinder with the soapy water
3. Observe what happens.

QUESTIONS

1. Can you explain how the bubbles floated above the dry ice?

EXPERIMENT 4: SUPER COLD SOLUTION

WHAT YOU NEED

- Dry Ice
- Gloves, tongs
- Beaker or plastic cup
- Alcohol
- Water
- Flowers or leaves

WHAT TO DO

1. Fill the cup half way with alcohol.
2. Add 3 to 5 pellets of dry ice to the cup.
3. Using tongs hold the flowers or leaves in the cup for about 30 secs.
4. Remove the flower from the cup and observe what has happened.

QUESTIONS

1. What happened to the flower after you put it in the dry ice/alcohol mixture?
2. How do you think this happened?
3. What is the freezing point of water?
4. Why do you think you used alcohol instead of water to make this super cold solution?

REAL WORLD APPLICATIONS OF DRY ICE

Packaging: Dry ice is commonly used as packaging for items that need to remain cold or frozen, such as ice cream.

Medicine: In medicine it is used to freeze warts and sunspots to help remove them.

Construction industry: Used in the construction industry to loosen floor tiles by shrinking and cracking them, as well as to freeze water in valveless pipes to allow repair.

Fire extinguishers: Fire extinguishers use CO₂ to douse the flames of an electrical fire. The CO₂ “starves” the fire of its oxygen.

RESOURCES USED TO DEVELOP THIS ACTIVITY

1. Wikipedia Encyclopedea. (2008). *Dry Ice*. Retrieved October 30, 2008, from http://en.wikipedia.org/wiki/Dry_ice#Applications
2. *Dry Ice Info.com*. (2004). Retrieved October 30, 2008, from <http://www.dryiceinfo.com/science.htm>

Image courtesy of: Ice factory online. Retrieved October 30, 2008, from www.icefactoryonline.com.