

## Episode 5 - A Matter of State

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1. The video states that states of matter may be changed. What is needed to make this possible?
2. What is the relationship between the temperature and pressure of a gas?
3. Describe, at the molecular level, how temperature affects the pressure of a gas.
4. How does the collapsing can demo work. Draw diagrams of before, during, and after the heating.
5. How is liquefied natural gas produced?
6. What are some uses of liquid nitrogen?
7. Why does the process of perspiration cool a person?
8. Describe the element bromine in its three states.
9. What happens to the particles in bromine as it is cooled?
10. What does the shape of a crystal tell us about its internal structure?

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## Answer Key

1. The video states that states of matter may be changed. What is needed to make this possible?

*Energy*

2. What is the relationship between the temperature and pressure of a gas?

*It is a direct relationship. As temperature increases the pressure increases.*

3. Describe, at the molecular level, how temperature affects the pressure of a gas.

*The number of collisions against the walls of the container increase. This results in the higher pressure.*

4. How does the collapsing can demo work. Draw diagrams of before, during, and after the heating.

*The condensation of the water in the can reduces the pressure in the can. The pressure outside the can is greater and causes the can to collapse.*

5. How is liquefied natural gas produced?

*Many gases are liquefied by putting the gas under high pressure and then allowing the gas to expand and cool until it drops below its boiling point. The liquefied gas must then be stored at low temperatures.*

6. What are some uses of liquid nitrogen?

*"Flash freezing" foods, storage of biological specimens, refrigerant.*

7. Why does the process of perspiration cool a person?

*The evaporation process absorbs energy from the skin.*

8. Describe the element bromine in its three states.

*The vapor is orange, the liquid is red, and the solid is yellow.*

9. What happens to the particles in bromine as it is cooled?

*The particles slow down and the attractive forces between particles increase.*

10. What does the shape of a crystal tell us about its internal structure?

*The crystal structure is often an indication of the internal arrangement of atoms in the crystal.*