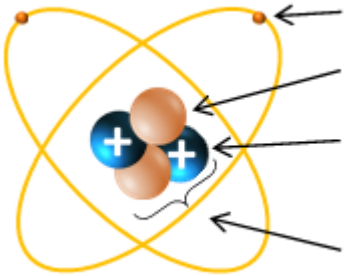
Shedding Light on Heat Episode 2: Changes of State Name:

1. On Earth, substances are commonly found in 3 states: _____; _____; and _____.

Part A

2. Label the diagram of the atom below (by dragging and dropping the words on the right).



protons

electrons

neutrons

nucleus

3. Protons have a _____ charge and electrons have a _____ charge.
4. The force of attraction between protons and electrons is called an _____ force.
5. Briefly describe (at the atomic level) what a solid is.

6. Describe (at the atomic level), what melting is.

7. Describe (at the atomic level) what a liquid is.

8. Tin melts at 232°C, but iron melts at 1538°C. What does this suggest about the size of the electrostatic force between tin atoms compared to the electrostatic force between iron atoms?

Part C

9. Describe what happens to the water molecules in water when it is heated and it reaches boiling point.

10. Describe (at the atomic level) what a gas is.

11. Why is it easy to compress gasses, but very difficult to compress solids and liquids?

12. When a gas is cooled it will eventually c_____ and form a liquid. The process is called _____.
13. What are clouds?

Part D

14. Dry ice is solid _____ _____.
15. Dry ice doesn't melt but _____ directly into a gas.
16. The mist that forms when dry ice is placed in water is not carbon dioxide. What is it?

17. Use the information in the table to answer the following.

Substance	Melting Point (°C)	Boiling Point (°C)
water	0	100
ethanol (alcohol)	-114.5	78.5
iron	1538	2862

(a) At a temperature of 57°C, water exists as a _____. (solid, liquid, or gas)

(b) At a temperature of 122°C, water exists as a _____.

(c) At a temperature of 89°C, ethanol exists as a _____.
(d) At a temperature of -100°C, ethanol exists as a _____.
(e) At a temperature of 1400°C, iron exists as a _____.
(f) At a temperature of 2600°C, iron exists as a _____.