

Quiz Review: Physical Properties -- Heat, States of Matter, and Cloud Formation

Matching:

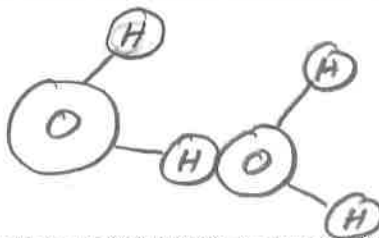
- |                  |                   |               |                   |
|------------------|-------------------|---------------|-------------------|
| A. Conduction    | B. Convection     | C. Condensing | D. Temperature    |
| E. Absolute Zero | F. Kinetic energy | G. Polar      | H. Thermal Energy |
| I. Solid         | J. Liquid         | K. Gas        | L. Melting        |
| M. Radiation     | N. Heat           | O. Freezing   | P. Evaporating    |

1. F Energy of motion.
2. The D of a substance tells us the average kinetic energy of the particles (atoms and/or molecules) in that substance.
3. The H contained in a substance is the sum (total) of all of the kinetic energies of the particles (atoms and/or molecules) in that substance.
4. J This is the state of matter in which molecules (or individual atoms) are touching one another, but they are sliding, bumping, moving around and changing positions.
5. K This is the state of matter in which molecules (or individual atoms) are flying free, but they occasionally bump into one another.
6. I This is the state of matter in which molecules (or individual atoms) are locked in place, touching one another, and vibrating.
7. A Heat transfer by touch.
8. N This is any transfer of thermal energy from a warmer object to a colder object.
9. B Heat transferred by warm currents flowing from one place to another
10. C Turning from a gas to a liquid.
11. L Turning from a solid to a liquid.
12. P Turning from a liquid to a gas.
13. O Turning from a liquid to a solid.
14. E This is the temperature at which all molecular motion stops.
15. M Examples of this type of energy transfer are infrared waves and visible light.
16. G This describes a molecule that has a positive end and a negative end.

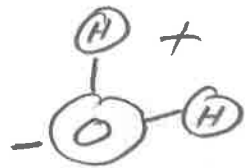
14. In order for a substance to turn from a liquid to a gas, that substance needs to \_\_\_\_\_ energy. In order for this to happen, the substance's surroundings must \_\_\_\_\_ energy.  
 a. Lose, gain      b. Lose, Lose      c. Gain, lose      d. Gain, Gain
15. In order for a substance to turn from a solid to a liquid, that substance needs to \_\_\_\_\_ energy. In order for this to happen, the substance's surroundings must \_\_\_\_\_ energy.  
 a. Lose, gain      b. Lose, Lose      c. Gain, lose      d. Gain, Gain
16. What happens to the temperature of air when it is compressed?  
a. It heats up.      b. It cools down.      c. It does not change.
17. What happens to the temperature of compressed air when the air is released and allowed to expand?  
 a. It heats up.      b. It cools down.      c. It does not change.

**Part II: Short Answer**

1 Draw two water molecules sticking together. Label the atoms with their element symbols.



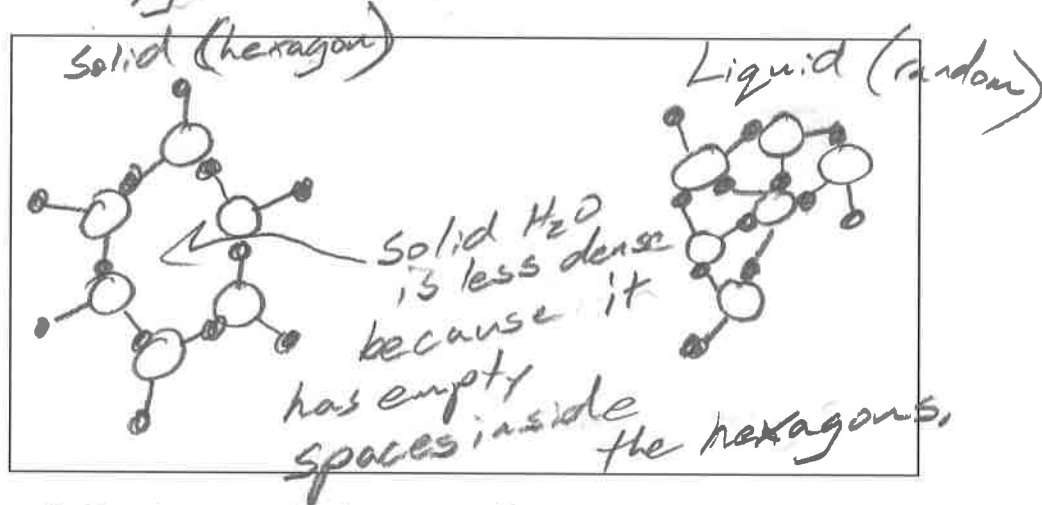
2. a. Which part of a water molecule has a positive charge? *The hydrogen atoms*



b. Which part of a water molecule has a negative charge?

*The oxygen atom*

3. Show why solid water is less dense than liquid water. In the box on the right, draw a diagram of 6 water molecules in frozen water. Then draw another 6 water molecules as they are arranged in liquid water. Label the liquid and solid water, and explain why solid water is less dense.



4. Humans sweat in order to stay cool. How does sweating keep us cool?

*- Sweat needs heat in order to evaporate.  
- Sweat takes this energy from our bodies, causing us to cool down.*

5. Rank the states of matter according to their density, for a typical substance (not water).

Most Dense: *Solid*      2<sup>nd</sup> Densest: *Liquid*      Least Dense: *Gas*

6. If you cool down a balloon what happens to its volume? Explain why.

*It shrinks. The molecules slow down, so they don't push as hard against the sides of the balloon.*

7. The chemical formula for table salt is  $\text{Na}^+\text{Cl}^-$ . Explain why salt melts ice.

*Salt ions grab the water molecules and pull them out of their hexagon formation.  $\text{Na}^+$  grabs the negative Oxygen.  $\text{Cl}^-$  grabs*

8. Explain why the melting of ice causes nearby substances to get colder.

*- Water needs heat in order to melt.*

*the positive hydrogen.*

*- Water takes this energy from its surroundings, making its surroundings cooler.*