Sc 7 Chapter 5 Pre-Test Review Parts 1& 2 Answers

Name: Date:

Starting at the beginning of Chapter 5 pg. 116 in textbook.

Part 1 Definitions: Place a complete definition for each of the following terms.

a. Particle Model(4 main ideas):

-All matter is made of tiny particles. *-Particles of matter are always moving*

-All particles have spaces between them *-Adding heat to matter makes particles move faster.*

b. **Solid:** *Has a fixed shape and a fixed volume because the particles can move only a little.*

c. **Melting:** *As a solid is heated, particles move faster and faster until they may break from fixed positions and move about more freely...thus going from a solid to liquid is called melting.*

d. **Freezing:** *As liquids cool their particles lose energy and move more slowly until they sit at a fixed position...thus a liquid has frozen into a solid.*

e. **Liquid:** *Takes the shape of its container because the particles can more more freely than when a solid. They are still quite close together, but not as close as a fixed position solid...they also have a fixed volume like a solid.*

f. **Evaporation:***When a liquid absorbs heat energy, particles move more quickly...some gain enough energy to be free of other particles, thus the liquid is changing to a gas.*

g. **Condensation:** *As a gas cools, the particles of gas lose energy and more more slowly until it condenses into a liquid.*

h. **Gas:** *The particles of a gas are separated by much larger spaces than particles of a liquid or solid, therefore a gas is mostly empty space.*

i. **Sublimation:***When individual particles of a solid gain enough energy to break away completely from other particles forming a gas...no liquid phase.*

j. i) **Physical Change:** *The substance remains the same, even though its form or state may change. Physical changes include: melting, freezing, evaporation, condensation and sublimation.*

ii) **2 Examples:** *A piece of wood cut into little pieces is still wood...a melted candle wax is still wax. Ice melting is still water, wax melting into a liquid is still wax. Sugar dissolved into water.*

k. i) **Chemical Change:** *The original substance is changed into one or more different substances with different properties. Such as when a candle is burning it becomes shorter and you can often see smoke. Some of the wax simply melts, but some seems to disappear. As the wax burns, some wax particles reacts with oxygen from the air to produce water vapour, carbon dioxide, heat and light...the disappearing wax actually changes into some of the other substances.*

ii) **Chemical Changes in Living Environment Examples:** *As mentioned above, burning a wax candle, boiling an egg, burning a wooden log. You see it get smaller, there is heat, smoke, and light and ash left over.*

iii) **Chemical Changes in Non-Living Environment Examples:** *Old bicycles, metal gardening tools and old cars in seasons of rain and snow along with oxygen in the air forming iron oxide or rust. Copper with moisture and oxygen become green copper oxide, etc.*

l. **Reversible Changes:** *Physical changes are often reversible, but not always. You can reverse the physical changes when you melt ice then freeze it again. You cannot reverse physical changes when sawing wood into little pieces.*

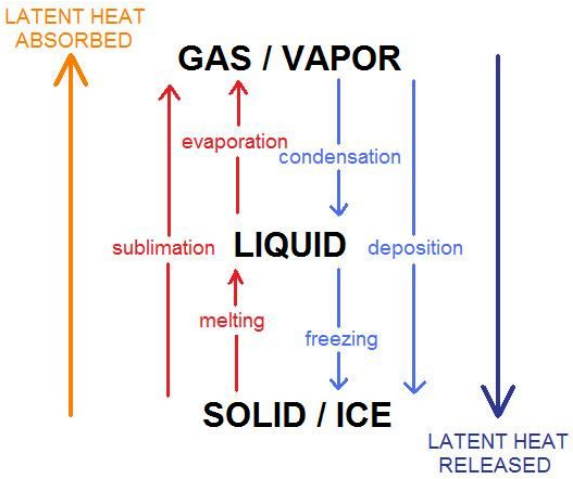
m. **Non-Reversible Changes:** *Are usually chemical changes such as boiling an egg, burning a candle or burning wood. You see things get smaller, feel heat and light is often, but not always given off.*

n. **Summary of States of Matter:(fill in the blanks with correct answers)**

State	**Fixed Mass?(Y/N)**	**Fixed Volume?(Y/N)**	**Fixed Shape?(Y/N)**
Solid	*Yes*	Yes	Yes
Liquid	Yes	Yes	No
Gas	Yes	No	No

Part 2: Properly Solve the Following:

1. **Using the particle model, explain what happens to water as it is gradually heated and changes from ice to steam.(3 marks)**



2. **Suggest 5 clues that you would consider before deciding whether a change is a physical change or chemical change.(5 marks)**

Chemical change occurs if a new colour appears, heat, light, sound, bubbles of gas are formed, or an odour, a precipitate forms in a liquid and the change is impossible to reverse.
Physical changes are mostly reversible.

State whether each of the following is chemical or physical change and provide at least 1 reason why.

	Changes we see happening in our world.	**Physical or Chemical**	**Reason why….**
a	**Frost forms on windows**	physical	You can heat up the frost(frozen ice
b	**Tea is made from using hot H_2O and tea bag.**	Chemical	The hot water change color by the material that leaves the tea leaves...this can not be reversed. Also, there could be a smell change as well.
c	**A firecracker explodes.**	Chemical	Heat, light, color, sound, smell and you cannot reverse this change.
d	**Concrete becomes hard after it is poured.**	Chemical	Chemicals in the concrete mixture react making the concrete get progressively harder. Also, heat is produced as the concrete cures.
e	**The burner on an electric stove glows red.**	Physical	The burner does glow with enough energy and does produce heat, but the mass of the burner should not change when cooled.
f	**Coffee changes color when cream is added.**	Physical	No extra heat, light etc happens...and with proper equipment you can separate the cream from the coffee.
g	**Liquid Nitrogen boils at - `196 ºC.**	Physical	The mass of the nitrogen does not change and you can cool it back into the same amount of liquid if it is sealed properly.
h	**Butter is heated in a frying pan until it browns.**	Chemicall	Change of color, due to the heat of the frying pan...you cannot reverse this.
i	**Hydrogen exposed to a flame makes a pop sound.**	Chemical	Not only sound, but light can occur with the small explosion...hydrogen bonds with oxygen in the air and becomes water vapour.

3. **Why is it easier to move your hand through air than water?(Use particle model to explain this)(2 marks)**

The molecules of matter in water are still very close to each other, but unlike being a solid, they are not locked into place, so they can move around each other(flow). But, since they are quite tightly bound together, you are pushing through so many molecules that there is resistance. The molecules in air; however, are at such a high energy state that they are a lot further apart, offering less resistance when moving your hand through them.

4. **Solids are described as having a fixed volume; however, most solids expand slightly when heated. Because of this bridges with metal connections have expansion joints...what would happen if there were no joints on the bridges?(2 marks)**

A good reason for expansion joints is that they allow for a rise and fall of temperature. If they were not implemented in bridges or building, the intense heat in the summer would expand the metal, brick, or concrete materials in a structure and the structure would have cracks and breaks in it. Also, in the winter the harsh cold temperatures would make the materials to contract (come together) and this would also result in disastrous circumstances.
All matter's molecules (or all molecules I have heard of) will speed up at higher temperature and slow down at lower temperatures. This is the reason for expansion joints in the first place... too allow expansion without breaking at extreme high and low temperatures.

5. **What are more important in your life, physical or chemical changes? Explain your answer.(2 marks)**

*Both are important for life. An example for essential physical changes is water that is essential for life. It undergoes physical changes continuously depending on the temperature of the earth. However, chemical changes are changing matter into something else...living things, such as us, have chemical changes occurring continuously in our bodies at all times, without these chemical reactions(changes) we could not live or even exist. Also, chemical changes in our environment such as the break down of dead plants and animals provides energy sources to start life agai*n.