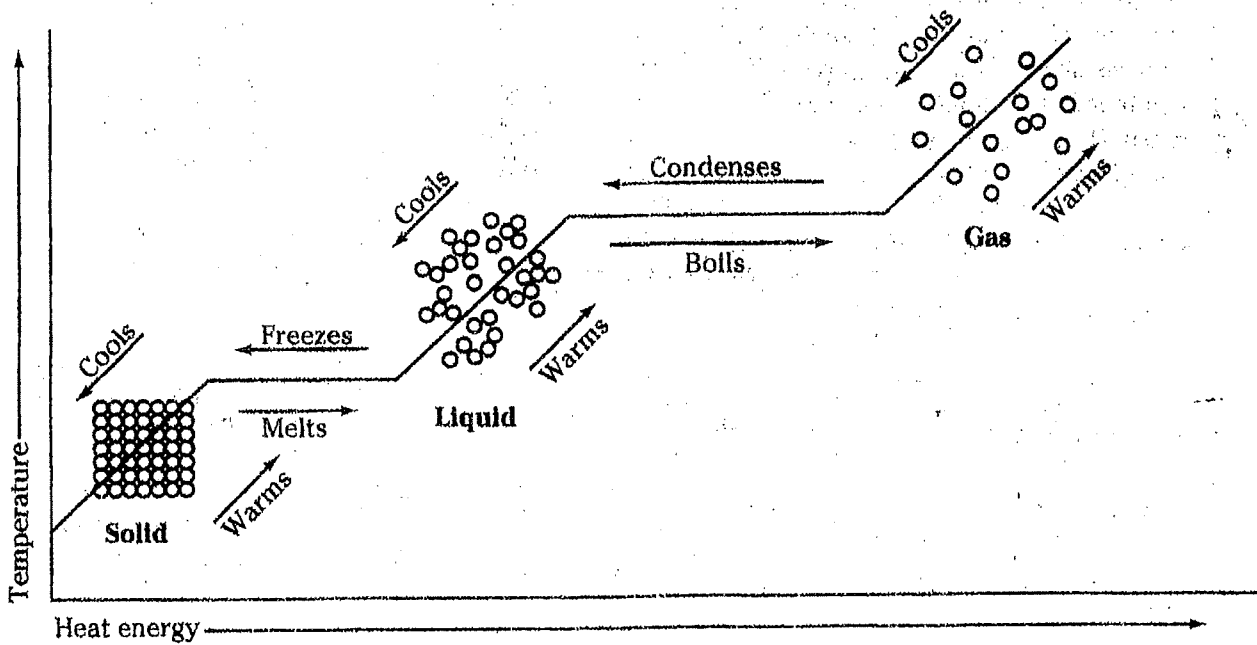


## Observing Phase Changes

The accompanying graph shows the relationship between temperature and heat energy during the phase changes of water. Study the graph and answer the following questions.



1. Does the temperature increase during melting? \_\_\_\_\_  
\_\_\_\_\_
2. Is energy required for each phase change? \_\_\_\_\_
3. Can both liquid water and steam exist at 100°C? \_\_\_\_\_
4. What must be changed—temperature or heat energy—during condensation? \_\_\_\_\_
5. How would you describe the change in the arrangement of particles as heat energy and temperature increase? \_\_\_\_\_  
\_\_\_\_\_
6. What rule can you state about the relationship between phase changes and temperature? Between changes and heat energy? \_\_\_\_\_  
\_\_\_\_\_

## Counting Atoms

The formula for a compound indicates the elements that make up the compound and the number of atoms of each element present in the compound. These numbers of atoms are indicated by the use of small numbers called subscripts. Sometimes groups of atoms act as a single atom. Such a group of atoms is called a radical. If a radical is used in a formula more than once, the radical is put in parentheses and the subscript appears outside the parentheses. When a subscript appears outside the parentheses, it indicates that all the elements inside the parentheses should be multiplied by that subscript. For example, the formula  $\text{Fe}(\text{OH})_3$  indicates the combination of one atom of iron, Fe, three atoms of oxygen, O, and three atoms of hydrogen, H.

In the following examples, list each element in the compound and the number of atoms of each element present. The first example has been done for you. You may already be familiar with some of the compounds.

Name	Use	Formula	Atoms in Formula
Calcium carbonate	Limestone	$\text{CaCO}_3$	Ca = calcium 1 C = carbon 1 O = oxygen 3
Aspirin	Pain reliever	$\text{C}_9\text{H}_8\text{O}_4$	
Magnesium hydroxide	Found in milk of magnesia	$\text{Mg}(\text{OH})_2$	
Paradichlorobenzene	Moth crystals	$\text{C}_6\text{H}_4\text{Cl}_2$	
Acetic acid	Found in vinegar	$\text{C}_2\text{H}_4\text{O}_2$	
Trinitrotoluene (TNT)	Explosive	$\text{C}_7\text{H}_5(\text{NO}_2)_3$	