

temperature:

- a measure of the \_\_\_\_\_ energy of the particles in a sample of matter
- does not depend on the amount of \_\_\_\_\_ in the sample
- symbol is \_\_\_\_\_; unit is \_\_\_\_\_

heat:

- \_\_\_\_\_ amount of \_\_\_\_\_ energy that flows because of a difference in \_\_\_\_\_.
- depends on \_\_\_\_\_ of sample
- symbol is \_\_\_\_\_; unit is \_\_\_\_\_ (1 J = 4.18 \_\_\_\_\_ )

Kinetic energy is \_\_\_\_\_

Potential energy is \_\_\_\_\_

- Potential energy is hiding and cannot be \_\_\_\_\_.
- Only \_\_\_\_\_ in P.E. can be measured.

specific heat capacity:

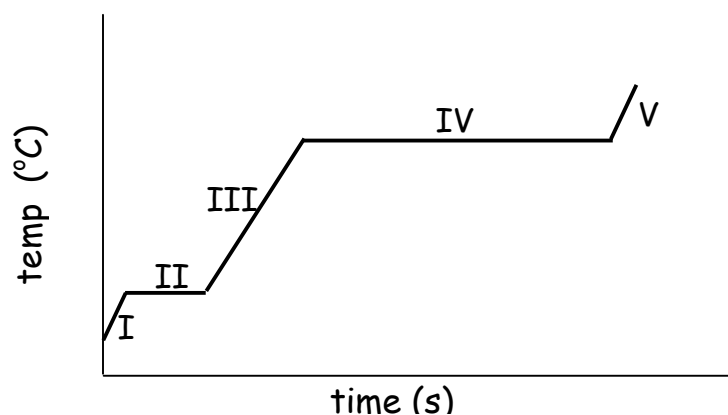
- amount of \_\_\_\_\_ required to raise the \_\_\_\_\_ of 1 \_\_\_\_\_ of substance 1 \_\_\_\_\_
- symbol is \_\_\_\_\_; unit is \_\_\_\_\_

$$\begin{array}{c}
 \text{_____} \downarrow \\
 Q = m \times C \times \Delta t \\
 \leftarrow \text{_____} \quad \uparrow \text{_____} \quad \leftarrow \text{_____}
 \end{array}$$

When heat (Q) is absorbed by a system, part of it (C) goes into storage as \_\_\_\_\_ energy and part of it is used to make the molecules move around \_\_\_\_\_, raising the \_\_\_\_\_ ( $\Delta t$ ).

Why does sand get hotter in the day and colder at night than the water?

## Heating Curve for Water



I:

Heat is being used to raise the \_\_\_\_\_ of the \_\_\_\_\_.

$$Q = \text{___} \times \text{___} \times \text{___}$$

II:

Heat is being used to turn solid to \_\_\_\_\_. (phase change)

$$Q = \text{___} \times \text{___}$$

heat of fusion - \_\_\_\_\_ required to change 1g of  
\_\_\_\_\_ to \_\_\_\_\_

III:

Heat is being used to raise the \_\_\_\_\_ of the \_\_\_\_\_.

$$Q = \text{___} \times \text{___} \times \text{___}$$

IV:

Heat is being used to turn liquid to \_\_\_\_\_. (phase change)

$$Q = \text{___} \times \text{___}$$

heat of vaporization - \_\_\_\_\_ required to change 1g of  
\_\_\_\_\_ to \_\_\_\_\_

endothermic change: ( \_\_\_\_\_ is an example.)

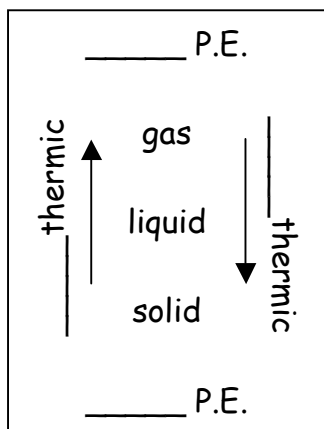
- \_\_\_\_\_ or \_\_\_\_\_ change in which a \_\_\_\_\_ absorbs \_\_\_\_\_ from its \_\_\_\_\_
  - \_\_\_\_\_ → \_\_\_\_\_ (Heat seems to \_\_\_\_\_.)
  - \_\_\_\_\_ of system \_\_\_\_\_ and it becomes less \_\_\_\_\_.
- ( \_\_\_\_\_ is another example.)

exothermic change:

- physical or chemical \_\_\_\_\_ in which a system \_\_\_\_\_ heat to its \_\_\_\_\_
- \_\_\_\_\_ → \_\_\_\_\_ (Heat seems to \_\_\_\_\_ out of \_\_\_\_\_ )
- \_\_\_\_\_ of system \_\_\_\_\_ and it becomes \_\_\_\_\_ stable.

Ex. - Why does your skin feel cool when you get out of the pool?

*Think about these steps to answer the question:*



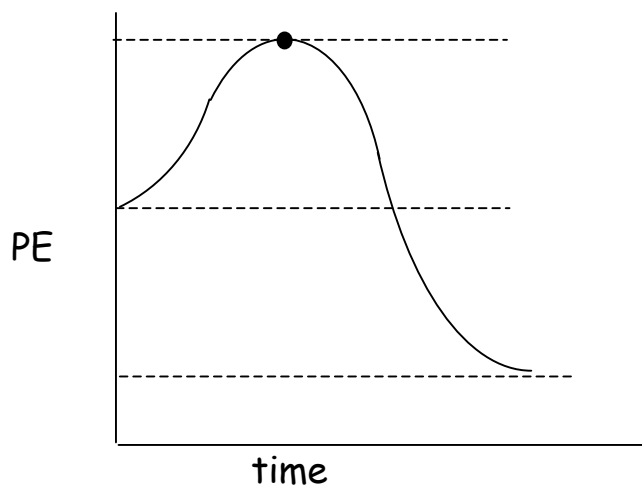
Identify the system - \_\_\_\_\_ goes from liquid ( \_\_\_\_\_ P.E.) to \_\_\_\_\_ ( \_\_\_\_\_ P.E.). This is an \_\_\_\_\_ change. In this type of change, the system (the water) \_\_\_\_\_ heat from the surroundings.

Identify the surroundings - \_\_\_\_\_ Your skin feels \_\_\_\_\_ because it \_\_\_\_\_ heat. The heat was used to \_\_\_\_\_ the water.

Why do farmers spray fruit on trees with water when the temperature is going to drop below freezing? *Identify the system and surroundings and make the statements about them (as done above.)*

## Energy Diagram of a Chemical Change:

Label the chart:



As molecules get closer, their electron clouds \_\_\_\_\_ each other, and their P.E. (increases, decreases).

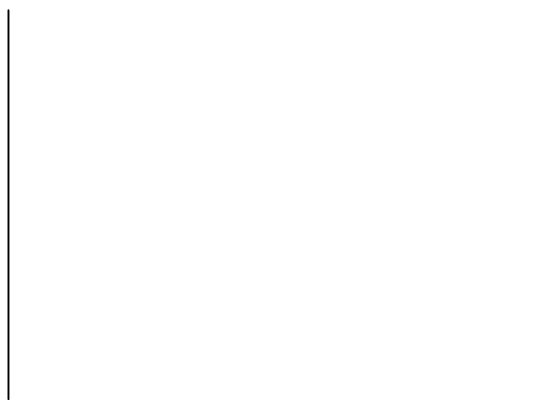
The \_\_\_\_\_ complex is highest point in P.E.

The energy required to reach the complex is called the \_\_\_\_\_ energy.

Products are (higher, lower) in P.E. than reactants and are (more, less) stable.

This reaction is \_\_\_\_\_ thermic.

Problem Set #1: Draw the P.E. diagram shown and label the following: reactants, products, activation energy, activated complex,  $\Delta H_r$  (+ or -)



Products are (higher, lower) in P.E. than reactants and are (more, less) stable.

This reaction is \_\_\_\_\_ thermic.

When Act E is high, the reaction is (slow, fast).

Sketch a diagram of these reactions:

slow, exothermic



faster, endothermic



faster, exothermic



Chemistry Quiz: CR1.

CR2.

1.

2.

3.