WARM UP AND LEARNING TARGETS LOG

Date	Learning Target	Warm Up

Insights

Unit 6

copy of

class notes

Name: ________________

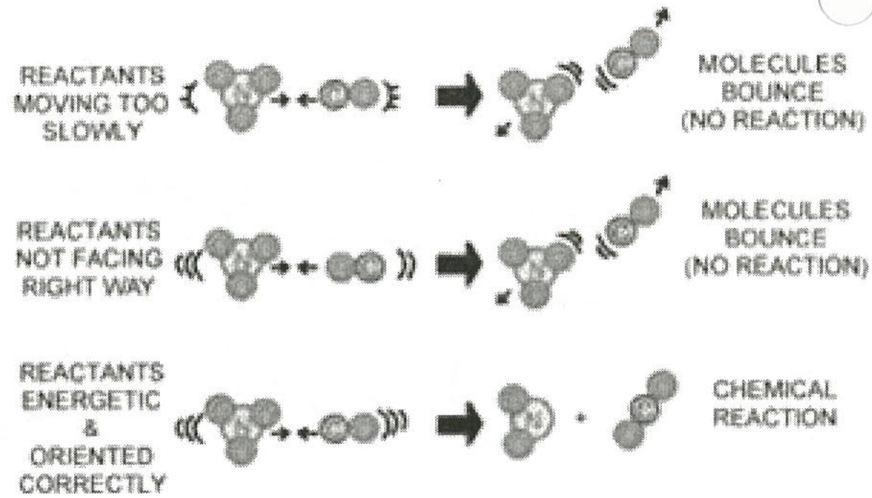
UNIT 6.1

Collision Theory & Rate of Reactions

What needs to happen for a chemical reaction to take place?

Collision theory:

in order to react particles must collide w/ enough energy and in the right orientation →



What do I need to do to speed up a chemical reaction?	Why does this work?	How does the new hypothetical school design change to increase the chances of getting a date to the dance?
1. Shrink container or increase concentration	more collisions	hallways get smaller
2. Increase number of particles	more collisions	population of school ↑
3. Speed up particles by adding heat	more forceful collisions	bell time is cut in half
4. Break up clumps into individual particles (increase surface area)	more collisions	no more traveling in packs
5. Add a catalyst	particles collide w/ correct orientation	introduce a "matchmaker"

UNIT 6.2

Types of Chemical Reactions

How do we recognize different types of chemical reactions?

Chemical reactions are changes that take place. Miss Virga's one woman show, "OMG did you see...", will help us to understand different types of chemical reactions.

Act 1	Act 2
Summary: Justin & Selena get together I'll call this: dating General "algebra-style" reaction: $A + B \rightarrow C$ **Chemistry calls this:** SYNTHESIS Example: $2H_2 + O_2 \rightarrow 2H_2O$	*Summary:* Justin & Selena break up I'll call this: break up General "algebra-style" reaction: $A \rightarrow B + C$ **Chemistry calls this:** DECOMPOSITION Example: $2H_2O \rightarrow 2H_2 + O_2$
Act 3	**Act 4**
Summary: Katniss gets w/ Peeta; leaves Gale alone I'll call this: single swap General reaction: $A + BC \rightarrow B + AC$ **Chemistry calls this:** SINGLE REPLACEMENT Example:	*Summary:* BFFs become couples I'll call this: double swap General reaction: $AB + CD \rightarrow AD + CB$ **Chemistry calls this:** DOUBLE REPLACEMENT Example: $NaOH + HCl \rightarrow NaCl + HOH$

UNIT 6.3

Conservation of Matter

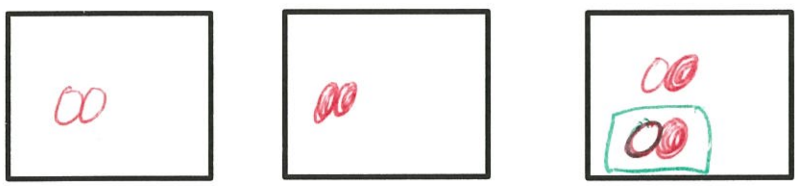
Is mass conserved during chemical and physical changes?

Chemical reactions are happening constantly; all around you and even inside you! How do we represent these changes taking place? The answer: writing chemical equations. Let's take a look at an example below:

Substances on LEFT side of arrow: reactants

Substances on RIGHT side of arrow: products

$$H_2 \quad + \quad Cl_2 \rightarrow 2\ HCl$$



☆ Do you notice a problem here? *Find a way to fix it in the drawing, then in the equation.* ☆

If you have a balanced budget, the amount of money that comes into your bank account is equal to the amount of money that goes out of your bank account. A **balanced equation** is similar: all goes in must also come out. In other words:

Matter is neither created nor destroyed

The number of each type of element on the left side (reactants) is equal to its counterpart on the right side (products). We can make this happen by changing the coefficients **(numbers written in front of chemical formula)**

2 KI + 1 F_2 → 2 KF + 1 I_2

K	~~1~~ 2	~~1~~ 2	✓
I	~~1~~ 2	2	✓
F	2	~~1~~ 2	✓

2 $KClO_3$ → 2 KCl + 3 O_2

K	~~1~~ 2	~~1~~ 2	✓
Cl	~~1~~ 2	~~1~~ 2	✓
O	~~3~~ 6	~~2~~ 6	✓

UNIT 6.4

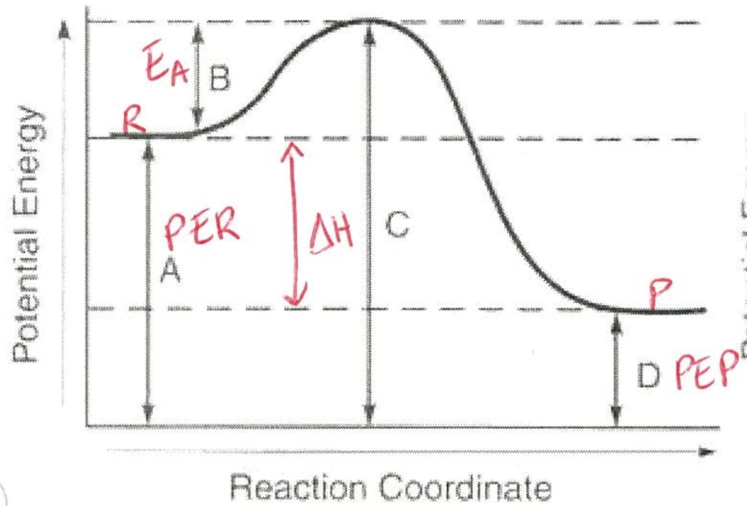
Potential Energy Diagrams

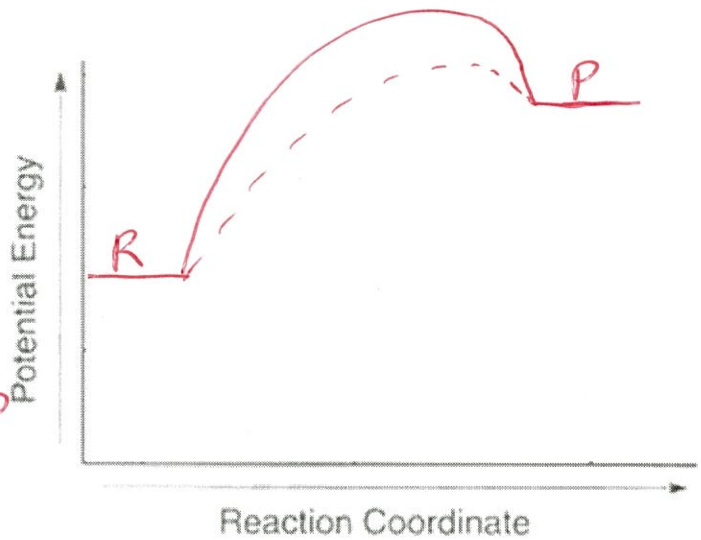
How can we model the transformation of energy in a chemical reaction?

As chemical reactions take place, the changes that occur are the result of breaking old bonds and forming new ones.

Breaking bonds requires **energy; making bonds** releases **energy**

The type of energy associated with chemical bonds is potential energy. One of the more useful graphs in chemistry tracks the changes in the potential energy of a chemical system as a reaction takes place:





EXOTHERMIC ENDOTHERMIC

PER: Potential Energy of Reactants

PEP: Potential Energy of Products

ΔH (PEP-PER): heat of reaction

E_A: activation energy (energy required to start reaction)

Task: Draw and label the PE diagram of an endothermic reaction. Add a dotted line on the diagram to show the effect of adding a catalyst to the reaction.

Endothermic: energy (heat) added, so... PEP > PER

Catalysts speed up reactions without affecting the reactants or products themselves. Therefore, they work by lowering the E_A.