Tuesday, March 3rd

Learning Target : I can determine how concentration, temperature, and pressure affect rates of reaction .

Homework: n/a

As you enter... (Copy or rephrase the question)

We have talked about what makes a collision effective. Now, let's talk about what factors increase or decrease the amount of collisions that occur.

Question: What do you think **"rate of reaction"** means?

Reminder: Parent Teacher Conferences Thursday from 3-5 pm

****EXAM next Wednesday, March 11th**

Big Idea: Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

8th/9th period

- Pre-Lab (15 min)
- LAB 16: Hand in at end of period (65 min)
- Clean up (5 min)

Pre-lab...

When you are done reading over the lab and answering the questions, have the teacher sign off on your lab so that you can get started.

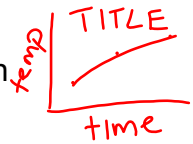
Lab...

**You will need one phone per group for use as a timer only.*

Post-Lab...

Before you leave, your lab table must be spotless and all materials and tools should be washed and returned.

Graph 1: Line graph



Graph 2: Bar graph

Graph 3: NO GRAPH

Tix out the door (Don't forget your name.)

Write a conclusion statement for each about how reaction rate depends on...

1. As Temperature _____, rate of reaction _____.
2. Particle Size
3. Pressure

Wednesday, March 4th

Learning Target : I can analyze my results and form conclusions about factors that affect the rate of reaction .

Homework: Potential Energy Worksheet due Friday

As you enter... (Copy or rephrase the question)

Why does increasing the temperature increase the rate of reaction?

--> TOMORROW: GO TO ROOM 228

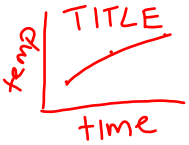
****EXAM next Wednesday, March 11th**

Big Idea: Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

9th period

- Lab Recap and Summary Poster (35 min)
- Exit Tix (5 min)

Graph 1: Line graph



Graph 2: Bar graph

Graph 3: NO GRAPH

Create a Poster!

Must include:

- All four factors
- Affects of each factor on rate
- At least 2 graphs
- At least 1 particle diagram

*Be creative and neat so I can hang them up!

OR Finish Lab from Yesterday

EXTRA CREDIT

Tix out the door (Don't forget your name.)

What are the **4 factors** that affect the rates of a reaction?
Explain 2 of them in detail.

NOTES: Rate of Reaction

What is rate of reaction?

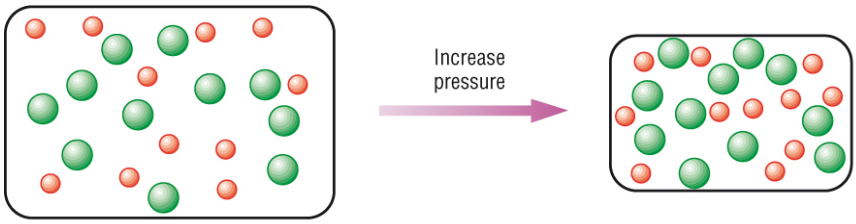
How fast the reaction will occur.

What 4 factors affect rate of reaction?

1. Temperature: ↑ temp, ↑ rate
   ↓ temp, ↓ rate

2. Particle Size: The smaller the size, the faster the rate of reaction.

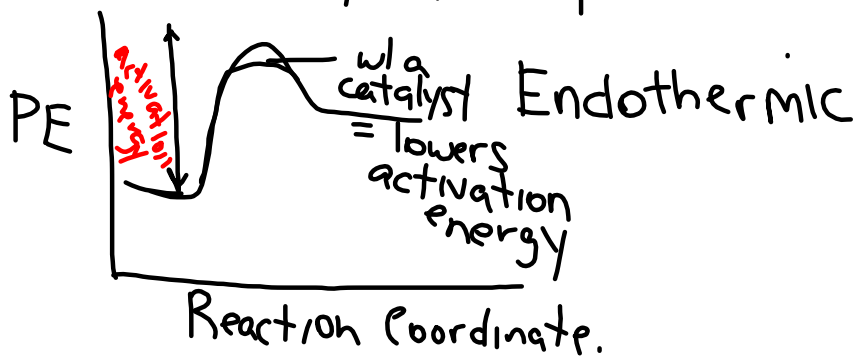
3. Pressure: ↑ pressure, ↑ rate



Here we have a number of gaseous molecules. The molecules have space to move around and there is little chance of a collision.

Increasing the pressure decreases the volume and increases the concentration. The molecules have less space to move in and are more likely to collide.

4. Catalyst: Something added to a reaction to speed it up



Thursday, March 5th

Learning Target : I can determine which direction a reaction will shift to alleviate a stress .

Homework: Potential Energy Diagram Worksheet due tomorrow

As you enter... (Copy or rephrase the question)

What do you think the word **equilibrium** is? Balance

Give an example of something that is at equilibrium.

Stable.

EXAM next Wed, March 11th --> so all assignments due then

Big Idea: Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

8th period
- Club Equilibrium video (10 min)
- Notes: The stresses of a bouncer's life (20 min)

9th period
- PhET Simulation (60 min)
- Exit Tix (5 min)

Video: https://www.youtube.com/watch?v=dXSnKCeAWvQ [2:53]

In your notebook/binder... Summarize what happened in the video and the key points to remember.

* concentrations are constant
* Rates are equal

Tix out the door (Don't forget your name.)

Given the equation representing a reaction at equilibrium:

$$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g) + \text{heat}$$

Which change causes the equilibrium to shift to the right?

(1) adding a catalyst
(2) adding more $O_2(g)$
(3) decreasing the pressure
(4) increasing the temperature

Explain WHY.

Friday, March 6th

Learning Target : I can predict how the stress from pressure will affect a system (reaction) .

Homework: Potential Energy Diagram Worksheet due today

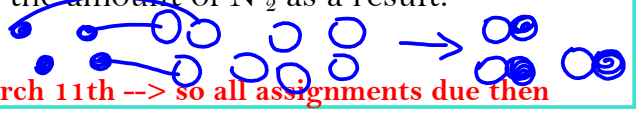
As you enter... (Copy or rephrase the question)

Given the following equation: $N_2 + O_2$ <----> 2NO + energy

1. Explain why the reaction shifts right if you increase the concentration of oxygen.

More reactant means shift right to even it out (shifts to the side with less)

2. What happens to the amount of N_2 as a result?



EXAM next Wed, March 11th --> so all assignments due then

Big Idea: Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

9th period

- A little more Notes (15 min)
- Game: Shift for Balance (30 min)
- Exit Tix (5 min)

Tix out the door (Don't forget your name.)

Which statement describes a chemical reaction at equilibrium?

(1) The products are completely consumed in the reaction.
(2) The reactants are completely consumed in the reaction.
(3) The concentrations of the products and reactants are equal.
(4) The concentrations of the products and reactants are constant.

The Stress's of a Bouncer's Life

Goal in the club: Obtain Equilibrium ⇌

Rate forward = Rate reverse

Problem: So many stresses in the club!

Club Equilibrium 200 max

VIP

H_2O + energy <-- --> H_2 + O_2

175 ← 25 people

Stress 1: Change in number of people (concentration of reactants and products)

H_2O + energy <-- --> H_2 + O_2

↑ shift right ↑ shift left

Stress 2: Change in temperature

H_2O + energy (heat) <-- --> H_2 + O_2

↑ ↑ shift right

$H_2 + O_2 \rightleftharpoons H_2O$ + energy

↑ shift left

1. increase H_2 Right Shift
2. increase H_2O left Shift
3. decrease H_2 left shift

Stress 3: Change in pressure

only focus on gases for this one

$2H_2O_{(g)}$ + energy <-- --> $2H_{2(g)}$ + $O_{2(g)}$

1st: How many moles of gaseous reactants? 2 moles

2nd: How many moles of gaseous products? 3 moles

3rd: Are there equal numbers of moles of reactants and products? No

So... When pressure is increased, the reaction will shift to the side with less moles of gas. This is because shift left.

less moles = less collisions = less pressure...

(and who wants to be burdened with so much pressure!?!? I would shift to the side with less pressure too!)

But, if pressure is decreased... which way will the reaction shift? To the side with more moles (right)

What if moles of gases are the same on both sides? What would happen if pressure is increased then? Nothing