

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.



3rd period

- Pre-Lab (15 min)
- LAB 16: Experiment 1 (25 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.

--Today: Do experiment 1 (including the graph)

--Tomorrow: Finish the rest of the lab (Experiments 2 and 3 + Analysis)

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



Wednesday, March 4th



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

Homework: n/a

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

How does temperature affect the rate of reaction? Explain your reasoning.

Reminder: Parent Teacher Conferences tomorrow 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.



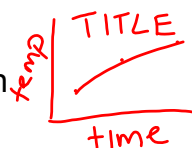
3rd period

- Finish LAB 16 (45 min)

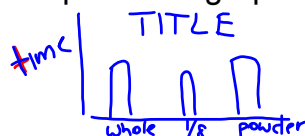
4th period

- Lab Recap and Summary Poster (45 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
- Effects of each factor on rate
- At least 2 graphs
- At least 1 particle diagram

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

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.

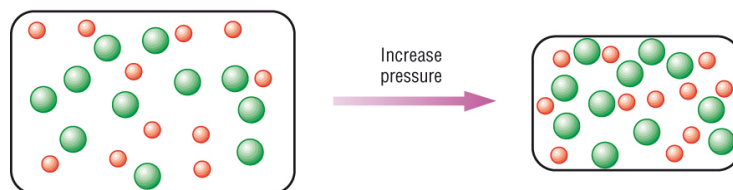
NOTES: Rate of Reaction

What is rate of reaction?

How fast a reaction happens.

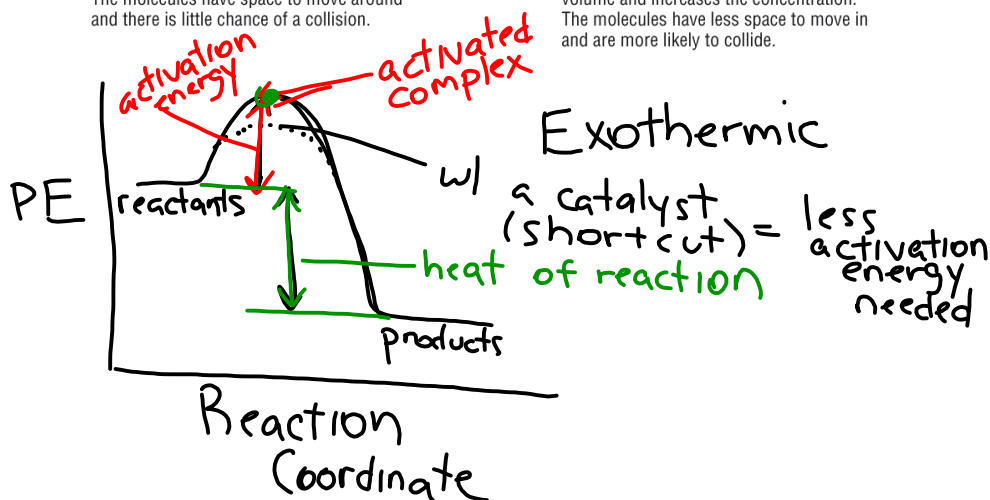
What 4 factors affect rate of reaction?

1. Temperature: As temp \uparrow , rate \uparrow
2. Particle Size: Smaller the particle size (more surface area), the faster the reaction
3. Pressure: Higher the pressure, the faster the reaction
4. Catalyst: Molecule that speeds up a reaction



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.



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.

TOMORROW: ROOM 228 FOR 3RD PERIOD ONLY

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.



3rd period

- Club Equilibrium video (10 min)
- Notes: The stresses of a bouncer's life (30 min)
- Game?
- Exit Tix (5 min)

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

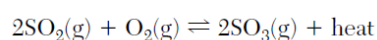
In your notebook/binder... Summarize what happened in the video and the key points to remember.

*(amounts)
Concentrations are constant
Rates are equal
forward rate = reverse rate*

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



Given the equation representing a reaction at equilibrium:



Which change causes the equilibrium to shift to the right?

- (1) adding a catalyst
- (2) adding more $\text{O}_2(\text{g})$
- (3) decreasing the pressure
- (4) increasing the temperature

Explain

WHY.



$$[\text{N}_2]_0 = 2 \text{ M}$$

$$[\text{O}_2]_0 = 2 \text{ M}$$

$$K = 16$$

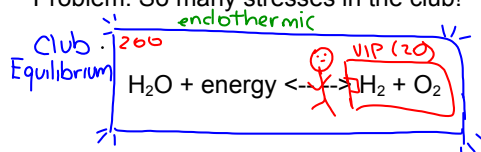
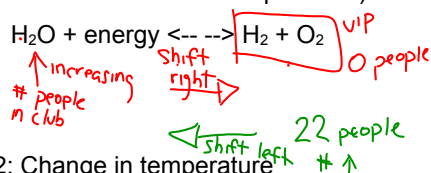
Find all concentrations at equilibrium.

The Stress's of a Bouncer's Life

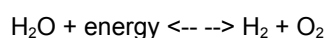
Goal in the club: Obtain Equilibrium

Rate of the forward = reverse

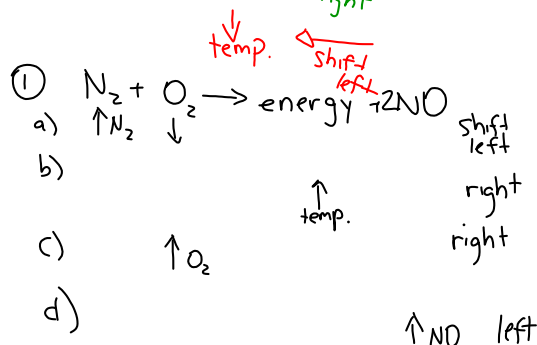
Problem: So many stresses in the club!

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

Stress 2: Change in temperature



Handwritten notes: "increase" with an upward arrow, "shift right" with a rightward arrow.

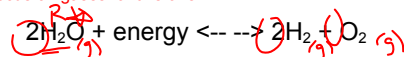


- a) increase NO Right
- b) increase N₂ Left
- c) increase temperature Right
- d) decrease O₂ Right

Which way will the reaction shift?

Stress 3: Change in pressure

only focus on gases for this one



1st: How many moles of gaseous reactants?

2nd: How many moles of gaseous products?

3rd: Are there equal numbers of moles of reactants and products?

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

→ 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 right.

What if moles of gases are the same on both sides?
What would happen if pressure is increased then?

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: $\text{N}_2 + \text{O}_2 \rightleftharpoons 2\text{NO} + \text{energy}$

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

To reach equilibrium, reaction shifts right to make more product.

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

decreases.

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.



3rd period

• PhET Simulation (45 min)

4th 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.