Chemist: _____ **Date:** _____

Unit 9: Chemical Kinetics & Equilibrium

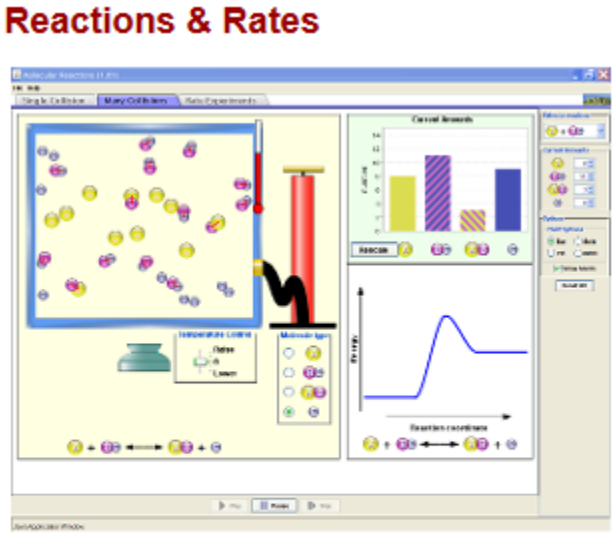
#4 Exploring Equilibrium PhET Simulation

Prelab:
Look up the term chemical equilibrium, then define it in your own words (it may help to look at a few different websites to help you understand it better):

Chemical Equilibrium:

Directions: in a new Google Tab, open the PhET Simulation Reactions & Rates. Choose "Run CheerpJ Browser Compatible Version." When the simulation opens, click on the "Many Collisions" tab.

Look at the screen and observe everything you can to find out about the reaction pictured, **A + BC → AB + C**.



1) Use the potential energy diagram shown to determine if the reaction is an exothermic or endothermic reaction. Explain your choice.

2) **Predict** what will happen to the amount of products when 50 A's are added to the box and 50 BC's are added.

3) In the box labeled "current amounts," enter 50 for A and 50 for BC.
a) Was your prediction correct? Describe and *explain* any differences.

b) Do all of the reactants turn to products? Why does this occur?

4) **Predict** what will happen when the temperature is raised but still below the activation energy max.

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5) Raise the temperature as described. Again, was your prediction correct? Describe and *explain* any differences.

6) **Predict** what will happen when the temperature is raised so it is above the activation energy max.

7) Raise the temperature as described. Again, was your prediction correct? Describe and *explain* any differences.

8) Did temperature affect equilibrium position? Did it affect it in the *way* you expected? Explain.

9) **Predict** what will happen when you increase the amount of the "A"s in the container? Explain.

10) Now increase the amount of the "A"s in the container? Did it affect it in the *way* you expected? Explain.

11) **Predict** what will happen when you increase the amount of the "A"s and "Bc"s in the container? Explain.

12) Now increase the amount of the "A"s and "Bc"s in the container? Did it affect it in the *way* you expected? Explain.