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**PhET Equilibrium Inquiry Activity**

**Learning Goals**

1. Visualize a system at dynamic equilibrium state (DES)
2. Characterize the DES by finding the red:green ball ratio, Krg.
3. Design an investigation to test the effect of changing temperature, number of balls and activation energy barrier has on the

**Part 1: Play**

Instructions:

1) Open the PhET “[Reversible Reactions](http://phet.colorado.edu/en/simulation/reversible-reactions)” simulation.

2) Play with the simulation. Click on EVERYTHING!

3) Answer the following questions:

1. Put some number of balls (>50) in one of the wells. In a table, record the number of green and red balls in each well as a function of time. (Suggested time length: 5 minutes, suggested intervals: 15-20 seconds) Paste the table into this document. (Google spreadsheet will work well for this.)
2. Paste in a graph of your data. Describe the shape of the graph and what it means in terms of the red and green balls. Consider the ratio of red balls to green balls. How does that change over time?
3. After some amount of time, this simulation reaches a dynamic equilibrium state (DES). That is, a situation in which components of a system are moving but no net change is observed. Describe how this simulation fits this model in terms of the amount of red and green balls.

**Part 2: Investigate**

Instructions: Investigate, using available tools in the simulation, the effect of a change in temperature, # of balls or activation energy on the Krg. Your investigation must include the following factors (and fit onto the rest of this page):

* Experimental question (ie How does X affect Y?): (Check your question with Dr. White before beginning)
* Independent variable:
* Dependent Variable: The ratio of red:green balls. Let´s call it “Krg”. ;)
* Controlled Variables:
* Table
* Graph
* Conclusions (1 paragraph referring back to data)