Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Dynamic Equilibrium Lab**

Guiding Questions: What is dynamic equilibrium? How is depicted on a rate of change graph?

Pre-Lab Questions:

1. What does dynamic mean? (As opposed to static)
2. A series of experiments will be conducted using straws and cylinders containing water. Students will move water between cylinder A and cylinder B using only their straws. What are some controls and variables that we can use to test the volume in each cylinder over time?

**Variables:**

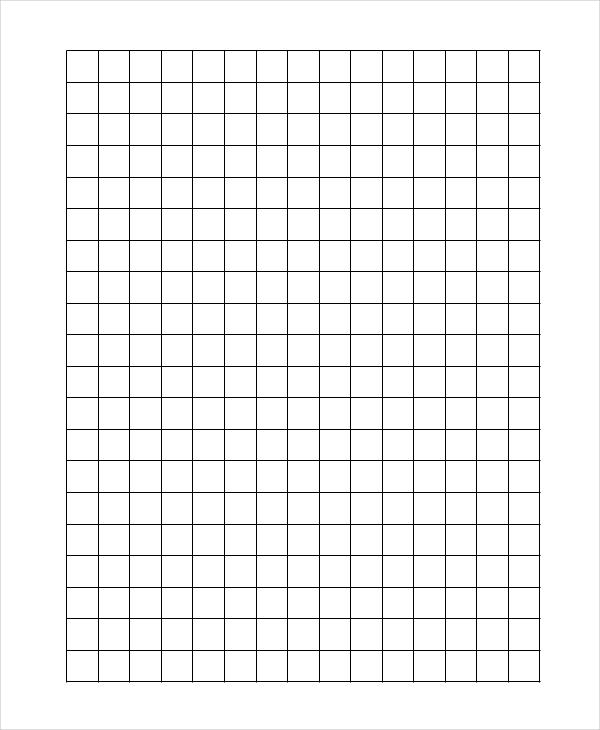
**Constants:**

Procedure:

**Data Table**

| Transfer | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cylinder A**  Volume (mL) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Cylinder B**  Volume (mL) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**Graph It!** Prepare a plot of your data. The number of transfers is on the x-axis, and the volume of the water is on the y axis. You will plot two graphs on the same axes, labeling cylinder A and cylinder B.



Questions:

1. Mark on your graph where equilibrium between the two cylinders was first established with a vertical line. How did you know that this line represents equilibrium?
2. Is it accurate to say that at equilibrium there is no change to the system? Explain.
3. Compare your graph with groups that used varying amounts of water and varying sizes of straws. What similarities exist in all the graphs?
4. If moving water from cylinder A to B is the “forward reaction” and B→ A is the “reverse reaction”:
   1. Compare the rates of the forward and reverse reactions during the first 3 transfers of your lab.
   2. Compare the rates of the forward and reverse reactions during the last 3 transfers of your lab.



1. What does equilibrium mean in terms of reactants, products, and rates of reaction?