Diffusion Lab

**Add 50 green particles (this does not need to be exact so don’t worry if you are out by 1 or 2).**

1. Slow the animation down and describe the motion of the green particles. Is it random are pre-determined? What happens when the particles hit each other?
2. What does the membrane do?
3. What do you think a membrane is? Google membrane definition if you are unsure.
4. Click on the show concentrations box. How would you describe the concentration of the green particles on the top half of the membrane? (High or Low) How would you describe the concentration of green particles below the membrane? (High or Low)

**Add 3 evenly spaced gated channels to the membrane. Speed up the animation again and then click the Open Channels button.**

1. The process you are observing is the process of diffusion. Describe the process using the key words **particle, movement, concentration, high and low**.
2. Closely observe the motion of the particles again and describe why diffusion takes place.

**Click on the reset all button and set up the green particles again. This time do the same thing with the blue particles.**

1. Speed up the animation to full speed. Open both gates and observe the concentrations. Wait for at least 1 minute. What happens to the concentration lines on both sides of the membrane?

**This is called *the equilibrium point*. The concentrations will change somewhat on either side of the membrane but they will stay relatively equal.**

**Your teacher will show you a video on diffusion.** <http://www.youtube.com/watch?v=H7QsDs8ZRMI>

1. Why do particles diffuse faster in a vacuum?
2. Why do nitrogen oxide particles travel faster than bromine particles?
3. How does temperature affect the rate of diffusion? Why do you think this is so? (It has to do with the speed of the particles.)

**Go back to the animation and press reset. Fill the top half with the maximum particles. Place 3 gated channels into the membrane. Set the animation speed to full speed then go to** [**http://www.online-stopwatch.com/**](http://www.online-stopwatch.com/) **and start the stop watch and open the channels at the same time. Time how long it takes to reach the equilibrium point.**

Reset the animation and do the same thing with 50 particles.

1. Which one was faster? How does concentration affect the rate of diffusion?
2. How do you think the thickness of the membrane would affect the rate of diffusion? Why?
3. How do you think the surface are of the membrane would affect the rate of diffusion? Why