Diffusion of a liquid.

Diffusion is the movement of molecules from areas of high concentration to areas of low concentration. With diffusion no energy is required and it is caused by kinetic energy. The rate of diffusion can be affected by many things including temperature, molecular weight, and movement.

To test the rate of diffusion a drop of dark food coloring was added to a glass of tap water and it was timed to see how long it took for the drop to reach the bottom of the glass. This procedure was repeated three times to get an average rate of diffusion. The water in each experiment measured 13 cm from the bottom of the glass to the top. The tap water for each experiment was taken from a jug so the temperature would be consistent. Before the food coloring was added the water in the glass was allowed to settle to decrease any movement. In the first experiment it took 61 seconds for the drop of food coloring to reach the bottom of the glass, in the second experiment it took 51 seconds and in the third experiment it took 32 seconds. To figure the rate of diffusion, divide the distance which was 13 cm by the time it took in seconds for the dye to reach the bottom of the glass.

The rate of diffusion for the first experiment was 13cm/46sec or 0. 28 cm per second, the second was 13cm/32sec or 0. 41 cm per second, and the third was 13cm/42sec. or 0.

31 cm per second. The average rate of diffusion was 0. 33 cm per second. I hypothesize that the color of the dye could make a slight difference in the rate of diffusion because the molecules that make up the dye may be heavier or lighter depending on what was used to make each color. I hypothesize that temperature would change the rate of diffusion.

In warmer water hydrogen bonds are constantly breaking and reforming causing molecules move more freely then they do in colder water. This movement would help the dye to diffuse through the water quicker. I hypothesis that the rate of diffusion could fluctuate due to the experimenters mood. If the experimenter was nervous or excited, the dye may drop forcefully causing it to descend more quickly to the bottom of the glass. If the experimenter is in a calm mood they may have a steadier hand and the dye would be dropped in lighter causing it’s descend to be slower.