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Lab 2D Report
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Filtration Lab

Purpose : The purpose of this lab is to further expand our understanding of the primal properties of passive transport.

Procedures : To prepare for lab 2D, we established our filtration system by inserting 3 individual filter papers to 3 individual glass funnels. We placed 1 clean empty beaker under each filter for a total of 3 empty beakers under the 3 filters. Once the filters were set, we poured 100 mL solutions of charcoal water into 3 different beakers. The 3 different beakers were measured separately in order to have each beaker carry different amounts of charcoal in the solution. The first beaker attained a thick coat of charcoal (3.18 grams of charcoal), the second beaker was measured to a medium thickness of charcoal (with 1.82 grams of charcoal), and the third beaker had the least amount of charcoal (.35 grams of charcoal) making the solution much thinner. We stirred each solution and we poured 50 mL of the thick solution into the first filter and observed and recorded the drops per minute as it fed through the filter paper, through the funnel, and into the glass beaker underneath. Being cautious with the solution level in the filter, we recorded the drops per minute again at the half-filled mark and again when the filter was nearly empty. We repeated this process with the remaining 2 beakers filled with the 100 mL solution of water and charcoal.

Results: Beginning with the first beaker carrying the thickest solution, we slowly poured the solution into the filter and funnel.In order for us to calculate the total drops per minute, we counted the number of drops that fell through the funnel for 15 seconds. We took that number and multiplied it by 4 to get the total drops per minute. We observed the drops and recorded 132 drops per minute. When the solution got to the half-filled mark, we recorded 92 drops per minute. We continued to observe the drops and once the filter was nearly empty, we recorded 24 drops per minute.Repeating the process with the second beaker with the medium-thickness solution, we poured 50 mL of the solution into the funnel and recorded 180 drops per minute. Once it got to the half-filled mark we recorded 96 drops per minute. When the filter was nearly empty, the drops per minute reduced to 32 drops per minute. Moving on to the beaker with the thinner solution, we poured 50 mL of the solution and recorded 208 drops per minute. At the half-filled mark, we recorded 128 drops per minute and once it was almost empty, we recorded 40 drops per minute.

Did the charcoal pass into the filtrate? After observing the drops and recording the drops per minute for the thickest solution, we analyzed the content that fell into the empty beakers underneath the filter. Ezri and I found that small amounts of charcoal had diffused through the filter and into the empty beaker along with the water. The water appeared clear and new, but, upon further examination, we found that it had a lightly polluted consistency. The medium-thickness solution was next to observe. Inspecting the beaker that caught the solution being poured through the funnel, we were surprised to see that there were bigger charcoal bits floating around (only enough to see at a closer look). Although the solution had bigger floating charcoal bits, the overall solution appeared much cleaner. Ezri and I then observed the last beaker with the thinnest solution, and we found that the solution was the cleanest out of the 3 beakers. The solution with the fastest rate of filtration was the solution containing the least amount of charcoal. Ezri and I agreed on the fact that the amount of pressure that was used during the pouring was a driving force of filtration. Other factors that affect the filtration was how high we held the beaker at the time of pouring it into the filter and how long we stirred the solutions. Another factor was the filter paper which allowed the solution to filter through.

Discussion: There are many factors that must be taken into account when performing an experiment that requires filtration and observing. It is crucial to make sure we record time during this experiment. If the measurements are not matching, we will be unable to record the correct data. When the time comes where we must observe, it is important to keep track of time when counting drops, otherwise our calculations will be inaccurate.

Conclusion : In this lab we observed how the charcoal was first in an area of high charcoal concentration and then moved to an area with lower concentration. We saw first hand how passive transport works in diffusion. For any kind of substance being observed, there is an entire process of diffusion that allows things to either: maintain its current state, grow and develop, or to decrease or degenerate the current state.