

Lab Report Guidelines  
SCI141: Biology Sections

Your lab report will be done on lab 2. Specifically, you will describe the diffusion lab. You will need to follow the guidelines described below.

**General Guidelines**

1. Report needs to be 1 ½ to 2 pages (or more), typed, double-spaced with a 12-point font.
2. Make sure that there are no grammatical or spelling errors in your text.

**Section 1 – Introduction**

1. Introduce your topic, pretend that you are writing for someone that has never heard about the topic before. Write simply. Make sure that you back up statements with references.
2. Make sure you briefly describe the purpose of the experiment.
3. Make sure you clearly state a hypothesis towards the end of your *Introduction*.

**Section 2 – Materials and Methods**

1. Quickly summarize the steps that you took in order to complete your experiment.

**Section 3 – Results**

1. Display only your results. Use tables, charts, graphs, etc. Make sure that you describe your data in as great a detail as you possibly can.
2. DO NOT make your conclusions in the results section. Just report your results.
3. Label all of your tables, graphs, etc.

**Section 4 – Conclusions**

1. Describe what you conclude based on your data.
2. Describe what may have gone wrong in your experiment.
3. List steps you might take in order to complete another similar experiment that demonstrates the same concepts.

**Section 5 – References**

1. You need at least 2 references.
2. You will use APA style formatting. There will be references for APA formatting on the lab website.
3. Only half of your references can be from the web. If you do use a web reference you must use the Web Evaluation Checklist from Lab 1 and attach the Checklist to your lab report.

Submit your paper with the following heading.

YOUR NAME  
DATE

YOUR LAB  
SCI141: Biology Sections

Title

SAMPLE LAB REPORT  
SCI141: Biology Sections

### **Introduction**

All cells are bound by a functional cell membrane. The cell membrane functions to protect a cell and to regulate the movement of molecules and ions into and out of cells. All cell membranes are either semi permeable (permeable to only water) or selectively permeable (permeable to molecules based on some determining factor). Experimental conditions can simulate cell membranes to show their selective permeability. Dialysis tubing can simulate a selectively permeable membrane.

What a selectively permeable membrane can prevent (selectively) is the normal diffusion of molecules. Diffusion is the passive process by which molecules and ions will move from areas of high concentrations to low concentration. Dialysis tubing will be selectively permeable based on the size of the molecule trying to diffuse through the membrane.

This experiment will examine four molecules and their permeability. The molecules are, in order of increasing size, iodine, water, dextrose, and starch. Based on the size permeability of the dialysis tubing, iodine, water, and dextrose will be able to diffuse across the selectively permeable membrane. The large molecular size of starch will prohibit its diffusion.

In order to verify the results of this experiment, will have to be able to detect the diffusion of the molecules. Two tests exist in order to verify the diffusion of our molecules. 1) When starch and iodine interact they form a bluish black color. Therefore, anywhere a noticeable bluish black color change occurs, both starch and iodine will be present. 2) Benedict's reagent, when applied to heat, will detect the presence of sugar (like dextrose). A positive Benedict's test at the end of the experiment will verify the presence of sugar.

### **Materials and Method**

See attached handout.

## Results

|                          | Before the Experiment   | After the experiment |
|--------------------------|-------------------------|----------------------|
| Beaker Contents          | Water, Iodine           | ???                  |
| - Starch/Iodine Reaction | - Negative              | - Negative           |
| - Benedict's Test        | - Negative              | - Positive           |
| Cell Contents            | Water, Starch, Dextrose | ???                  |
| - Starch/Iodine Reaction | - Negative              | - Positive           |
| - Benedict's Test        | - Positive              | - Positive           |

The iodine/starch reaction was only positive inside the cell, indicating that iodine had entered the cell, while starch did not diffuse out of the cell. A Benedict's test was Positive both inside and outside of the cell. This indicates that dextrose was able to diffuse out of the cell. There was no test that measured the diffusion of water. Visual observation confirmed that the dialysis tube was more turgid after the experiment. This could be possible verification of the diffusion of water.

## Conclusion

Water, iodine, and dextrose are all molecules that were able to diffuse across the selectively permeable membrane, based on their established concentration gradients. The results showed several tests that verified the diffusion of those molecules. This verifies the original hypothesis that molecules that fit the size requirement of the selectively permeable membrane (dialysis tubing) will be allowed to diffuse across their concentration gradients. Starch, however, failed to diffuse because its size must have been too large to be compatible with the selectively permeable membrane.