

# Permeability Model

## Lab Report

**Problem:** Is the plastic bag permeable to iodine?

**Hypothesis:** This iodine will get into the bag of starch.

**Independent Variable:** color of the iodine solution

**Dependent Variable:** color of the starch solution

**Materials:** one glass beaker, one plastic sandwich bag, one graduated cylinder, iodine, starch, and a dropper

### Procedure

- 1.) Fill the plastic bag with 40 mL of starch solution. Twist the top of the bag and tie it.
- 2.) Observe and record the color of the starch in the before section of the data table.
- 3.) Fill a beaker with 80 mL of water, and add iodine to the water until the water is a golden yellow color.
- 4.) Observe and record the color of the iodine solution in the before section of the data table.
- 5.) Place the plastic bag containing the starch solution into the beaker containing the iodine solution.



- 6.) Leave overnight.
- 7.) Remove the plastic bag from the beaker.
- 8.) Observe and record (in the after 24 hours section of the data table) the color of the starch solution inside the plastic bag.
- 9.) Observe and record (in the after 24 hours section of the data table) the color of the iodine solution inside the beaker.
- 10.) Clean up.

Plastic baggie with starch solution

Beaker of iodine solution.



### EXPERIMENTAL DATA

	Before	After 24 hours
Color of Starch solution inside bag	It was a whitish color.	Dark, purple, black color.
Color of Iodine solution inside beaker	A golden color.	A transparent crème color.

### CONTROL DATA

	Before	After 24 hours
Color of starch solution inside bag	White	White
Color of H <sub>2</sub> O in beaker	Transparent	Transparent



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### Conclusion

The conclusion to this test is that the plastic bag is permeable to iodine. The result of this experiment clearly answers the "Problem" as stated above. This is ~~proven~~ by the fact that the starch solution (dependent variable) in the baggie turned purple, indicating the presence of iodine (independent variable) in the mixture. The starch solution is the dependent variable because its color is affected by the iodine solution. My hypothesis was that the iodine will get into the bag of starch because the baggie is permeable to iodine. If the iodine solution penetrates the bag, it will turn the starch solution inside the baggie, purple. The control data chart above shows that if the starch had not been immersed in the iodine solution, but rather a water solution, it would have remained the same color, white. Obviously, in order for the iodine to enter the starch solution, the baggie must be permeable to the iodine. The baggie represents a cell membrane. This lab is meant to demonstrate whether or not a cell membrane is permeable to substances. Cell membranes of living organisms may be permeable to some substances, but not permeable to other substances. In this experiment, I charted that the iodine solution in the beaker did not turn purple. This means that the starch solution did not penetrate the baggie and therefore did not mix with the iodine outside the baggie. Because of this data, it is clear that the plastic baggie is not permeable to starch, but is permeable to iodine. In a cell membrane, this is called selective permeability. In other words, the iodine can go through the baggie, but the starch cannot. The purpose of this experiment is to show that a cell membrane is a type of barrier, and is permeable to some substances, but may not be permeable to all substances. Therefore, a cell membrane is selectively permeable.

Don't use term "proven."  
Instead say "supported."

No personal pronouns.

## Questions

1.) What part of a cell does the plastic bag represent?

The plastic bag represents the cell membrane.

2.) What color was the starch at the start of the experiment? At the start of the experiment, the starch was white in color.

3.) Did the iodine move into the bag? How do you know? Yes, the iodine moved into the bag, because the starch in the bag turned a purple color and the iodine is purple.

4.) Did the starch move out of the bag? How do you know? No, the starch did not move out of the bag, because the outside solution was not purple.

5.) Was the iodine in the beaker lighter in color before or after the experiment? The iodine in the beaker was lighter in color after the experiment.

6.) Is the plastic bag permeable to iodine? How do you know? Yes, the plastic bag is permeable to iodine, because iodine got in with the starch and it turned purple.

7.) Is the plastic bag permeable to starch? How do you know? The plastic bag is not permeable to starch, because the solution outside of the bag had not turned purple so the starch stayed in the bag.

8.) At the start of the experiment, was the iodine in high or low concentration outside of the bag? At the start of the experiment, the iodine was in high concentration outside of the bag.

9.) At the start of the experiment, was the iodine in high or low concentration inside of the bag? At the start of the experiment, the iodine was in low concentration inside of the bag.