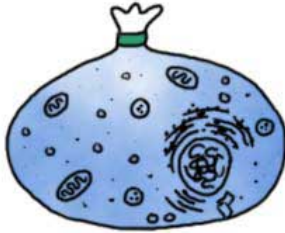


# DIFFUSION-IN-A-BAG

## INTRODUCTION



Membranes, whether cell membranes or plastic sandwich bag membranes, allow the passage of certain molecules and prevent passage of others. You may not believe it but sandwich bag plastic permits slow passage of water and other small molecules, but does not allow other larger molecules (or sandwiches) to pass through. This slow passage of water molecules is a type of diffusion (osmosis).

Diffusion is initiated by natural, random molecular movement (Brownian motion). Any molecule may diffuse through a membrane if it is small enough.

## PURPOSE

To provide an understanding of the diffusion of substances through a semi-permeable membrane.

## PRE-QUESTIONS

1. Define the following words:

diffusion:

osmosis:

semi-permeable:

2. What color is Lugol's iodine solution?

3. What color does Lugol's iodine solution turn when mixed with starch?

4. What type of substances are used to show chemical properties usually by a color change?

## PROCEDURE

- A. Fill a plastic lunch bag with 40 mL of starch solution. You may add a small object to represent the nucleus if you like but check it out with Mr. U. first. Seal the bag by twisting the top and tying it with a short piece of string. This will be your “cell”.
- B. Fill the large beaker with 40 mL of water. Careful with the turbo-blaster sink nozzles as water comes out of them with some gusto. Turn on the water **before** you place the beaker in the stream of water.
- C. Pour 5 mL of Lugol’s Iodine solution into beaker with water.
- D. Note and record in table 1 the exact color of the starch inside the plastic bag “cell” as well as the color of the Lugol’s iodine solution in the Before column.
- E. Place bag into beaker of Lugol’s iodine solution. Allow beaker to stand for 10-15 minutes.
- F. After 10-15 minutes note and record in table 1 in the After column the color of the Lugol’s iodine solution and the color of the starch inside your cell.

## DATA:

Table 1.

	Before	After
Color of starch inside “cell”		
Color of Lugol’s sol’n outside “cell”		

## ANALYSIS AND CONCLUSIONS:

1. Explain why there was or was not a color change inside the bag.

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2. Explain why there was or was not a color change in the solution outside the bag.

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3. Complete the chart below.

Moved Into The Plastic Bag	Moved Out Of The Plastic Bag

4. Did the water move into or out of the plastic bag? Use diagrams and words to explain your answer. Careful! Trick question!

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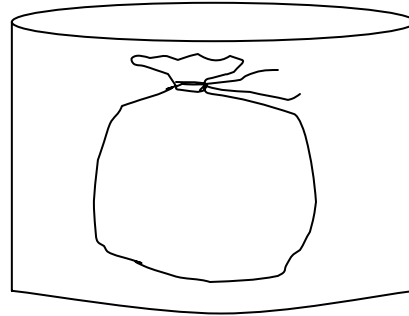
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**LABELED DIAGRAM**



5. If the plastic bag were allowed to sit in the beaker indefinitely, would diffusion ever cease? Explain your answer fully, using diagrams and words.

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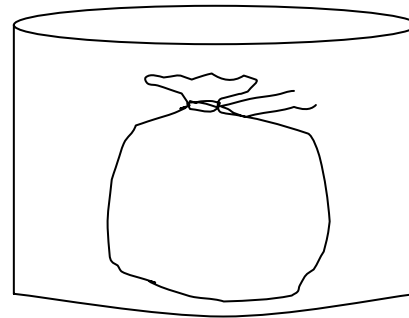
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**LABELED DIAGRAM**



6. Why was the starch unable to pass through the plastic bag? Explain your answer in words and a diagram.

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**LABELED DIAGRAM**

Draw one below

7. What does all of this have to do with cell membranes and their function? (You can use the back to answer this one!)