CELL MEMBRANE MODEL

PROCEDURE

* Fill a plastic lunch bag with 40 mL of starch solution. Seal the top of the bag by twisting the bag and attaching a rubber band or twist tie. The plastic bag filled with starch solution represents a cell.

* Note and record in Table 1 the exact color of the starch inside the plastic bag cell. Use the "Before" column to record your observation.

* Fill a beaker with 20 mL of water. Add 20 mL of iodine solution to the water. **CAUTION:** *If iodine spillage occurs, rinse with water and call your teacher immediately.* The water and iodine solution represent the environment into which you will place your plastic bag cell.

* Pour some of the water-iodine solution from the beaker into the test tube. Fill the test tube about 1/4 full. Mark this tube "before".

* Place the plastic bag and test tube into the beaker of iodine solution.

* Put your group number on the beaker with a tape label. Allow the "cell" to stand overnight.

* The next day, remove the plastic bag and test tube and put them aside.

* Pour some of the remaining iodine-water solution from the beaker into a new test tube. Fill the test tube about 1/4 full. Mark this tube "after".

* Decide which tube, before or after, contains the darker and lighter of the two solutions. Record which solution is lighter in Table 1.

* Using the "After" column, record in Table 1 the color of the starch inside the cell.

TABLE 1. COLOR CHANGES

	BEFORE	AFTER
Color of starch inside bag (cell)		
Color of iodine outside bag (cell)		

CELL MEMBRANE MODEL- ANALYSIS

1. The plastic bag represented what part of an actual cell?

Iodine solution plus starch (or polysaccharide) forms a blue color when mixed together.

2. Did starch move out of the bag?

3. What evidence did you see to support your answer?

A membrane is permeable to a substance if that substance can move through the membrane. It is impermeable if that substance cannot move through the membrane.

4. Using your experimental results, explain if the bag was impermeable or permeable to iodine.

5. Using your experimental results, explain if the bag was impermeable or permeable to starch.

Diffusion results in the movement of chemicals through a permeable cell membrane from areas of high concentration toward areas of low concentration.

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

7. At the start, was iodine high or low concentration inside the bag?

Some scientists believe that membranes contain very small pores. Pore size may determine why chemicals can or cannot pass through a cell membrane.

8. How might the size of the membrane pore compare to the size of the iodine molecules?

9. How might the size of the membrane pore compare to the size of the starch molecules?

10. How did the iodine move into the bag? (What process?)