Name: _____ Date: _____

Notes on the Diffusion State Lab

Part 1: Chemical Indicators

An __indicator__ identifies the existence or __presence__ of a substance that we may not be able to identify using our five senses.

Chemical Indicators

Indicator	Substance it Identifies	Color Change
Starch indicator solution (__iodine__)	__starch__	__blue/black__
Glucose indicator solution (__Benedicts__)	__glucose__	Green/Orange (any color other then blue)

** Remember glucose indicator solution must be _heated_ in order for it to indicate the presence of glucose.

Starch is a very __large__ and __complex__ molecule.

Glucose is a __small__ and __simple__ molecule.

Practice questions

1. What color does starch indicator solution change in the presence of starch?

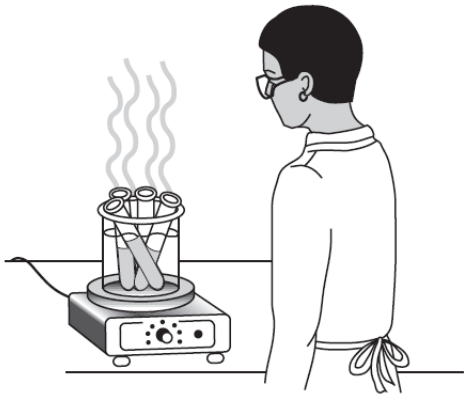
   a) brown/amber b) amber
   c) blue/black d) yellow

2. Glucose indicator solution identifies the presence of

   a) lipids b) protein
   c) starch c) simple sugar

glucose and starch are both carbohydrates

The diagram below shows a student heating some test tubes with chemicals in them during a laboratory activity.



3. Explain why putting stoppers in the test tubes could be dangerous.

   Gas expands when heated so the stopper could explode off or cause the testube to shatter

4. Part of a laboratory procedure is shown in the diagram above. This setup would most likely be involved in a procedure to

   (1) stain specimens while making a wet mount
   (2) test for the presence of glucose using an indicator
   (3) separate pigments in a mixture
   (4) determine the pH of solutions

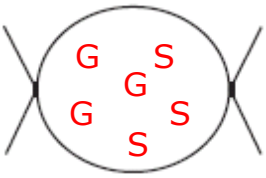
Part 2: Diffusion Through the Cell Model

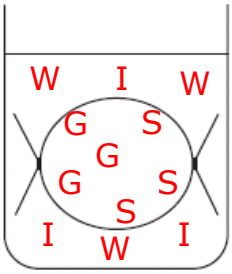
In this part of the experiment we made a model of a cell and placed into a beaker containing water.

We placed _glucose solution_ and _starch solution_ into the artificial cell membrane (dialysis tubing).

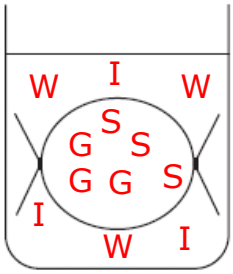
Use the key to draw the molecules that were inside the cell and the beaker.

Key
G- glucose I- iodine S- starch W- water

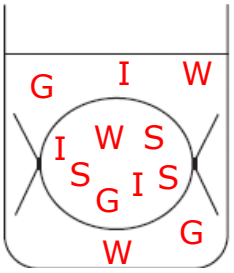




Using the key above sketch the contents inside the artificial cell and beaker in its initial state(immediately after it was set up) and 20 minutes later.



initial state



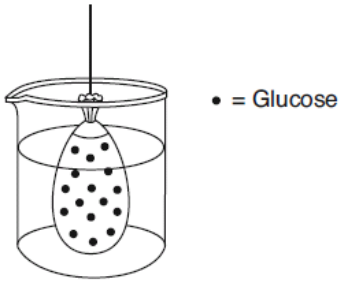
20 minutes later

final State

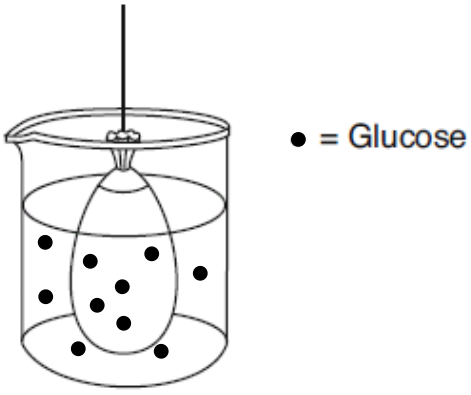
Practice Questions

Base your answers to questions 1 and 2 on the information below and on your knowledge of biology.

An artificial cell filled with a glucose solution was placed in a beaker of water, as represented below. The beaker was left undisturbed for 20 minutes.



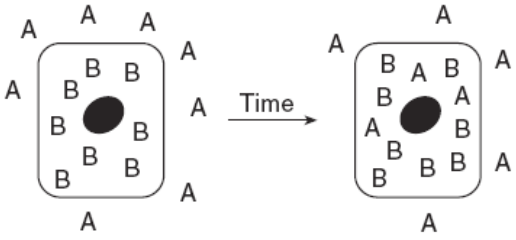
1. In the diagram below, draw in the expected location of the glucose molecules after 20 minutes.



2. If both glucose and starch were added to the artificial cell, where would the starch be located after 20 minutes?

It would remain inside the cell because it is a complex molecule, therefore too large to pass through the membrane

Two molecules, *A* and *B,* and their distribution inside and outside of a cell are represented in the diagram below.



3. State *one* possible reason why molecule *A* could diffuse across the membrane of the cell but molecule *B* could *not*.

Molecule B must be too large to diffuse across the membrane of the cell

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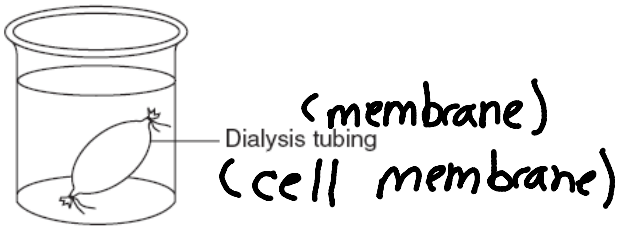
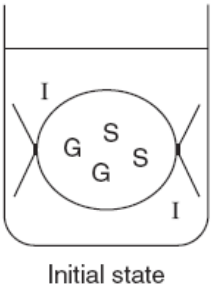
An experimental setup using a model cell is shown in the diagram below.



4. State what cell structure the dialysis tubing represents.

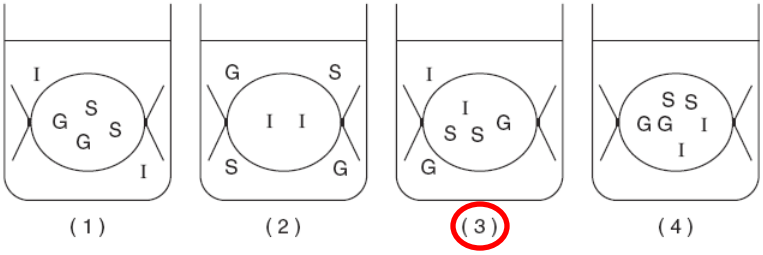
Cell Membrane

A model cell setup is represented in the "Initial State" diagram below.



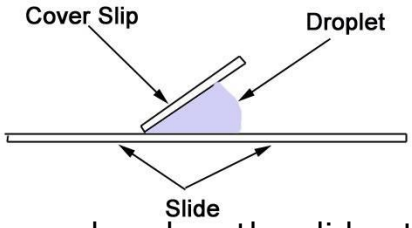
Key
S = starch
G = glucose
I = starch indicator

5. Which diagram indicates the areas where each of these substances would be located after 20 minutes?



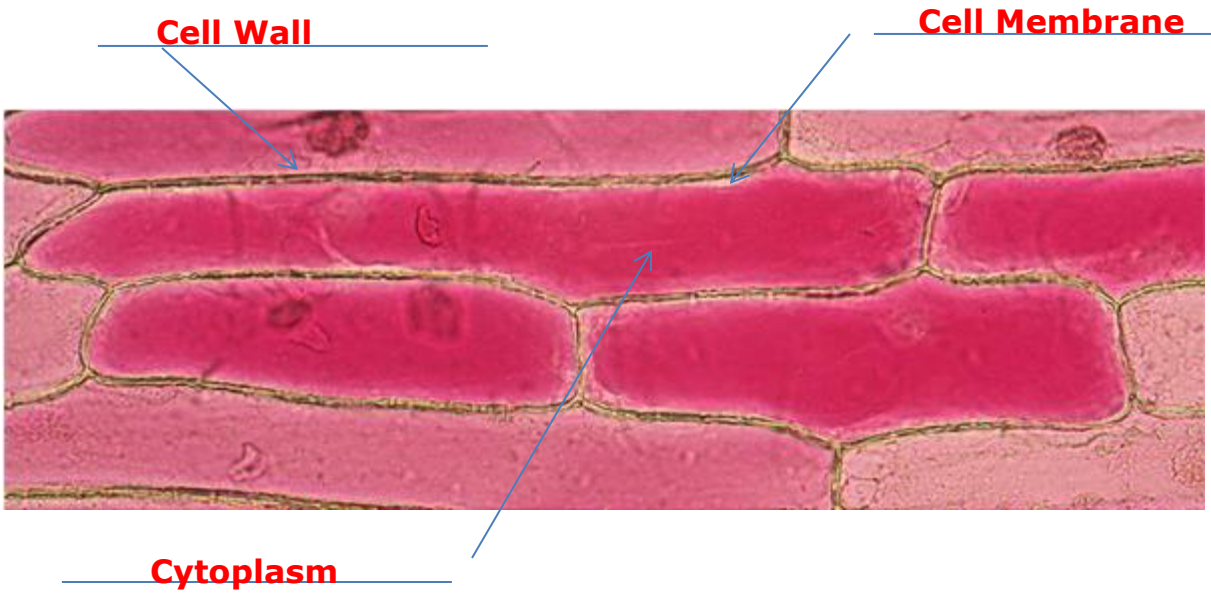
Part 3: Diffusion Through a Red Onion (Plant) Cell

During this part of the lab we placed red onion cells on a slide in a __**distilled**__ __**water**__ solution, then viewed the red onion cells using a microscope under high power. The slide was set up using the procedure in the diagram below.

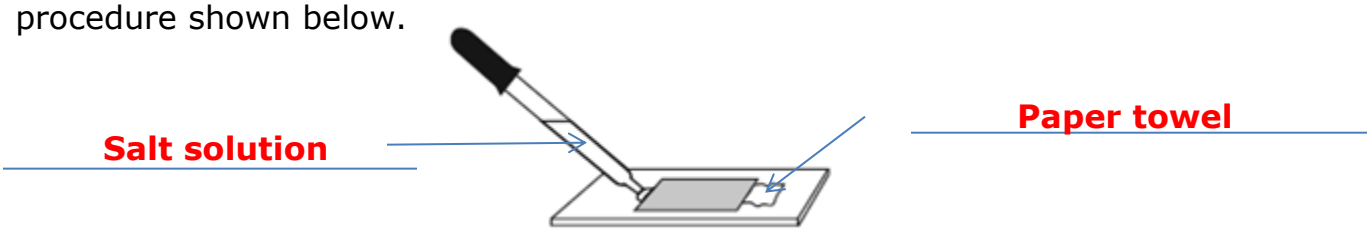


The reason the coverslip was placed on the slide at an angle then lowered was to __**reduce**__ the number of air bubbles.

The image of the onion cell in __**a distilled water solution**__ seen under the microscope is shown below. Label the cell wall, cell membrane, and cytoplasm.

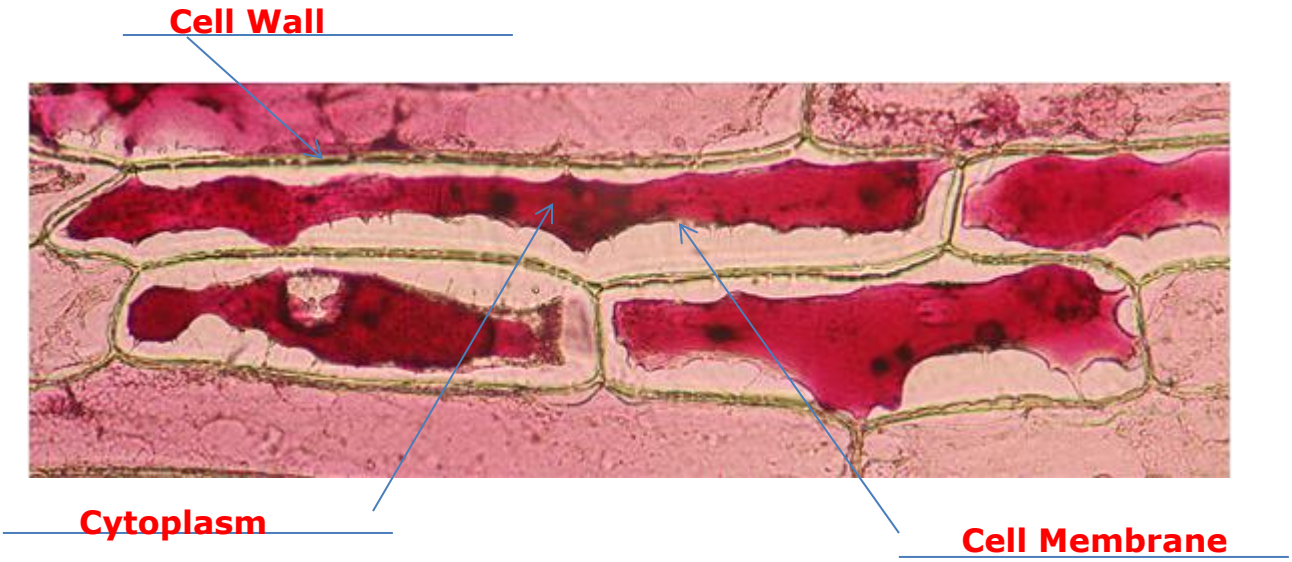


Next we viewed the same red onion cells in a __**salt solution**__ using a microscope under high power. The salt water solution was added using the procedure shown below.



This procedure was used to __**reduce**__ the number of air bubbles and prevent damage to the specimen.

The image of the onion cell in ___**salt solution**_____ seen under the microscope is shown below. Label the cell wall, cell membrane, and cytoplasm.



The process that caused the changes seen in the cell is _**diffusion**_ or **osmosis** which is the diffusion of water.

Finally we placed the onion cells back into a distilled water solution and saw the cells return to their original state because of the process of **diffusion** or **osmosis**
http://www.youtube.com/watch?v=nHWUAdkYq4Q
http://www.youtube.com/watch?v=lzDlGl3b4is&list=PLF6F91D872F556162

Practice Questions

A red onion cell has undergone a change, as represented in the diagram below.

1. This change is most likely due to the cell being placed in
   (1) distilled water
   (2) light
   (3) salt water
   (4) darkness

2. What process caused the change? _**diffusion**___

3. In the space provided sketch the cell labeled 2 as it would appear if it was placed back into a distilled water solution.