Name

1. In the binomial system of nomenclature, which two classification groups provide the scientific name of an organism?

   A) kingdom and phylum
   B) phylum and species
   C) kingdom and genus
   D) genus and species

2. What is a similarity between all bacteria and plants?

   A) They both have a nucleus
   B) They are both composed of cells
   C) They both have chloroplasts
   D) They both lack a cell wall

3. The cell theory states that

   A) all cells have nuclei that contain genetic information
   B) living organisms are composed of cells that arise from preexisting cells
   C) all cells regenerate and contain the same basic structures
   D) organisms that lack certain organelles reproduce by binary fission

4. Which cell structures are correctly paired with their functions?

   A) The mitochondria produce enzymes, and ribosomes transport them.
   B) The ribosomes make proteins, and the nucleus stores genetic information.
   C) The cell membrane make enzymes, and cytoplasm transports them.
   D) The vacuole stores genetic information, and chloroplasts make proteins.

5. The chloroplast is to a plant as

   A) a window is to a building
   B) a solar cell is to a building
   C) a room is to a building
   D) the roof is to a building

6. Which cell structure is correctly paired with its primary function?

   A) ribosome–protein synthesis
   B) mitochondrion–movement
   C) vacuole–cell division
   D) nucleus–storage of nutrients

7. Muscle cells in athletes often have more mitochondria than muscle cells in nonathletes. Based on this observation, it can be inferred that the muscle cells in athletes

   A) have a smaller demand for cell proteins than the muscle cells of nonathletes
   B) reproduce less frequently than the muscle cells of nonathletes
   C) have nuclei containing more DNA than nuclei in the muscle cells of nonathletes
   D) have a greater demand for energy than the muscle cells of nonathletes

8. One difference between plant and animal cells is that animal cells do *not* have

   A) a nucleus
   B) chloroplasts
   C) a cell membrane
   D) centrioles

9. The ability of an organism to obtain food, seek shelter, and avoid predators is most directly related to the function of

   A) reproduction
   B) egestion
   C) locomotion
   D) excretion

10. A wet-mount slide preparation of a specimen is stained in order to

    A) eliminate some organelles
    B) make cell structures more visible
    C) use the high-power lens
    D) remove water from the slid

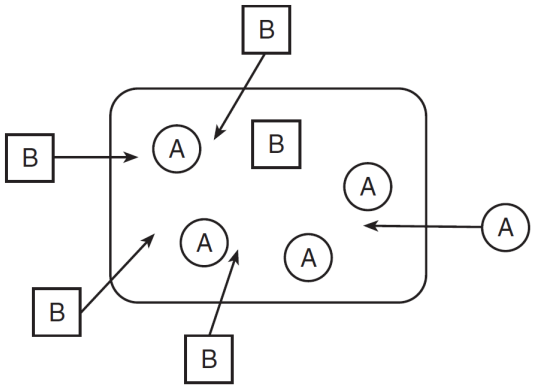
11. What cellular structure must oxygen cross to get from the outside to the inside of an animal cell?

    A) The nucleus
    B) The cytoplasm
    C) The cell membrane
    D) The cell wall

12. A substance is most likely to diffuse into a cell when

    A) it is a large organic food molecule such as protein or starch
    B) it is enclosed in an organelle such as a vacuole
    C) the concentration of the substance is greater outside the cell than inside
    D) the pH of the substance is greater than the pH of the cell

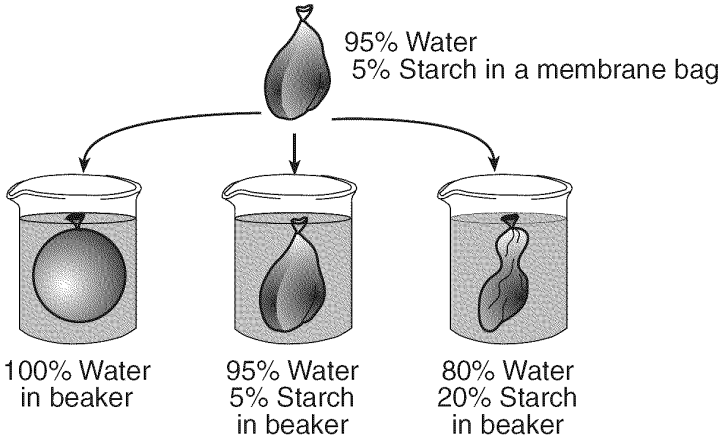
13. The diagram below shows two different kinds of substances, *A* and *B*, entering a cell.



ATP is most likely being used for

A) substance *A* to enter the cell
B) substance *B* to enter the cell
C) both substances to enter the cell
D) neither substance to enter the cell

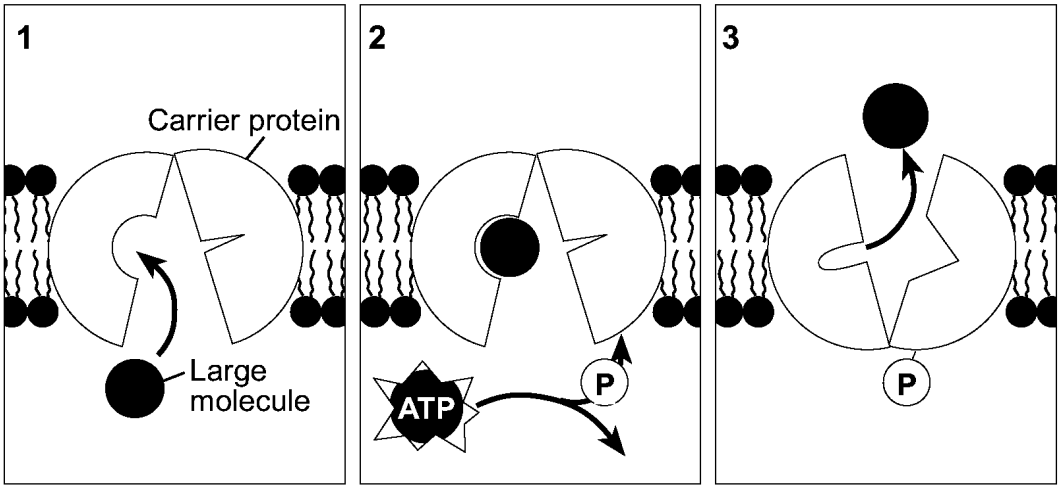
14. Base your answer to the following question on An investigation was set up to study the movement of water through a membrane. The results are shown in the diagram below.



Based on these results, which statement correctly predicts what will happen to red blood cells when they are placed in a beaker containing a water solution in which the salt concentration is much higher than the salt concentration in the red blood cells?

A) The red blood cells will absorb water and increase in size.
B) The red blood cells will lose water and decrease in size.
C) The red blood cells will first absorb water, then lose water and maintain their normal size.
D) The red blood cells will first lose water, then absorb water, and finally double in size.

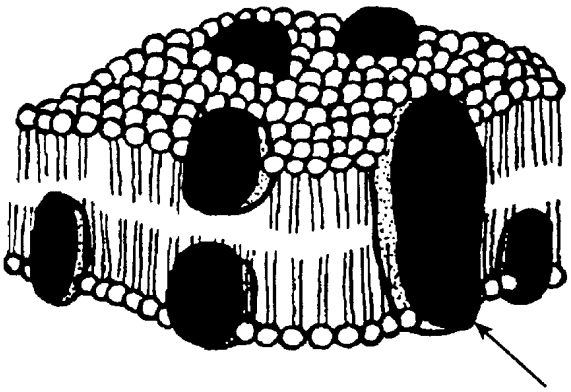
15. Base your answer to the following question on The diagram below represents movement of a large molecule across a membrane.



Which process is best represented in this diagram?

A) active transport
B) diffusion
C) protein building
D) gene manipulation

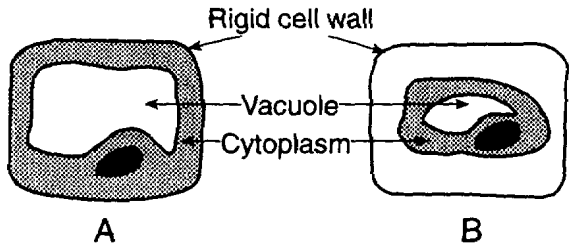
16. Base your answer to the following question on the diagram below which represents the fluid-mosaic model of a cell membrane.



The arrow points to a component of the membrane that is best described as a

A) sugar floating in lipids
B) protein floating in lipids
C) lipid floating in proteins
D) lipid floating in sugars

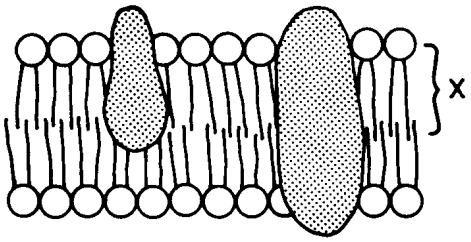
17. Base your answer to the following question on A biologist observed a plant cell in a drop of water as shown in diagram *A*. The biologist added a 10% salt solution to the slide and observed the cell as shown in diagram *B*.



The change in appearance of the cell resulted from

A) more salt moving out of the cell than into the cell
B) more salt moving into the cell than out of the cell
C) more water moving into the cell than out of the cell
D) more water moving out of the cell than into the cell

18. Base your answer to the following question on The diagram below represents a section of a plasma membrane.



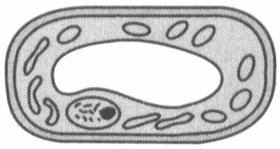
What does structure *X* represent?

A) a protein
B) glucose
C) a lipid
D) glycogen

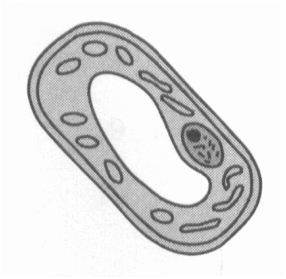
19. Which process would include a net movement of sugar molecules through a membrane from a region of lower concentration to a region of higher concentration?

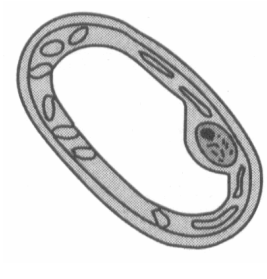
A) osmosis
B) cyclosis
C) active transport
D) passive transport

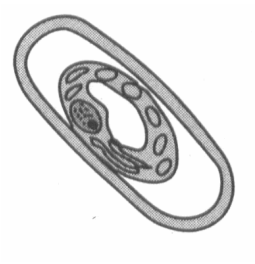
20. Base your answer to the following question on The diagram below represents a plant cell in tap water as seen with a compound light microscope.

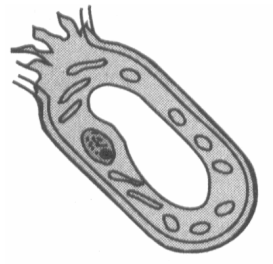


Which diagram best represents the appearance of the cell after it has been placed in a 15% salt solution for two minutes?

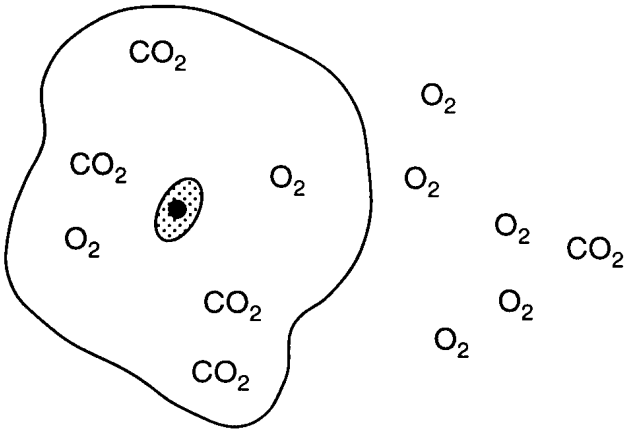
A)


B)


C)


D)


21. Base your answer to the following question on The diagram below represents a cell in water. Formulas of molecules that can move freely across the cell membrane are shown. Some molecules are located inside the cell and others are in the water outside the cell.



Based on the distribution of these molecules, what would most likely happen after a period of time?

A) The concentration of O_2 will increase inside the cell.
B) The concentration of CO_2 will remain the same inside the cell.
C) The concentration of O_2 will remain the same outside the cell.
D) The concentration of CO_2 will decrease outside the cell.

22. Plant cells can synthesize energy-rich organic molecules, and later break them down to extract that energy for performing life processes. These activities require direct interaction between the

A) chloroplasts and vacuoles
B) cell walls and ribosomes
C) chloroplasts and mitochondria
D) ribosomes and mitochondria

23. Leaves of green plants contain openings known as stomates, which are opened and closed by specialized cells allowing for gas exchange between the leaf and the outside environment. Which phrase best represents the net flow of gases involved in photosynthesis into and out of the leaf through these openings on a sunny day?

A) carbon dioxide moves in; oxygen moves out
B) carbon dioxide and oxygen move in; ozone moves out
C) oxygen moves in; nitrogen moves out
D) water and ozone move in; carbon dioxide moves out

24. What does the process of photosynthesis produce?

A) starch, which is metabolized into less complex molecules by dehydration synthesis
B) protein, which is metabolized into less complex molecules by dehydration synthesis
C) glycerol, which is metabolized into more complex carbohydrates by dehydration synthesis
D) glucose, which is metabolized into more complex carbohydrates by dehydration synthesis

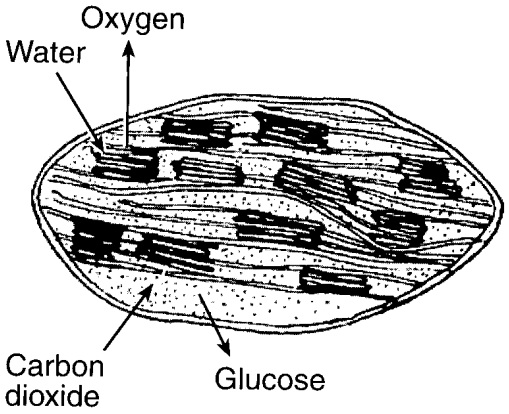
25. Which substances must a green plant obtain from its environment to carry on photosynthesis?

A) glucose and water
B) oxygen and chlorophyll
C) carbon dioxide and water
D) carbon dioxide and oxygen

26. Some sea slugs store chloroplasts obtained from algae they have ingested. The chloroplasts continue to carry out photosynthesis within the slugs. What advantage would this activity be to these sea slugs?

A) The slugs with chloroplasts can synthesize some of their own food.
B) The slugs with chloroplasts no longer need to carry out respiration.
C) The chloroplasts provide the slugs with camouflage that protects them from UV radiation.
D) The chloroplasts contain enzymes that allow the slugs to digest starch.

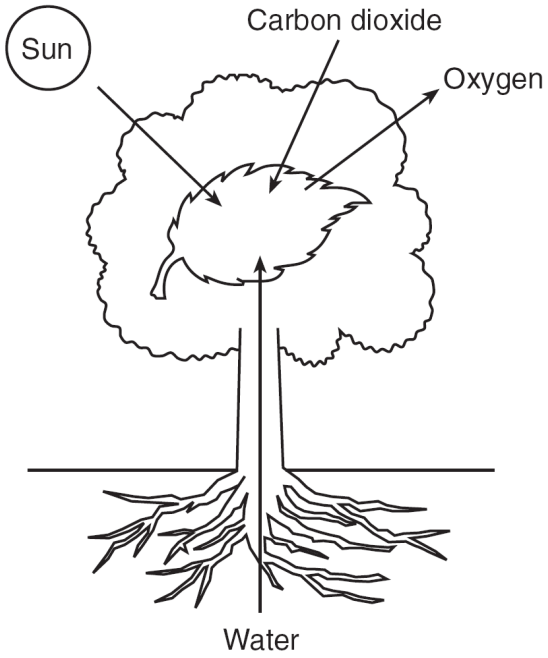
27. Base your answer to the following question on The diagram below illustrates the movement of materials involved in a process that is vital for the energy needs of organisms.



The process illustrated occurs within

A) chloroplasts
B) mitochondria
C) ribosomes
D) vacuoles

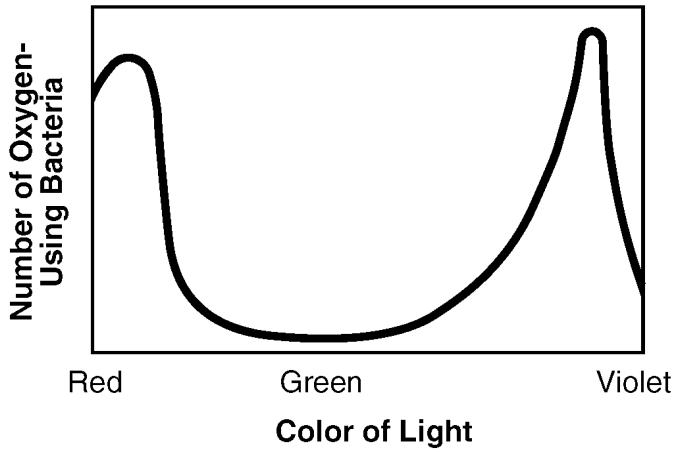
28. Base your answer to the following question on The diagram below represents events associated with a biochemical process that occurs in some organisms.



Which statement concerning this process is correct?

A) The process represented is respiration and the primary source of energy for the process is the Sun.
B) The process represented is photosynthesis and the primary source of energy for the process is the Sun.
C) This process converts energy in organic compounds into solar energy which is released into the atmosphere.
D) This process uses solar energy to convert oxygen into carbon dioxide.

29. Base your answer to the following question on The graph below shows the results of an experiment in which a container of oxygen-using bacteria and strands of a green algae were exposed to light of different colors.



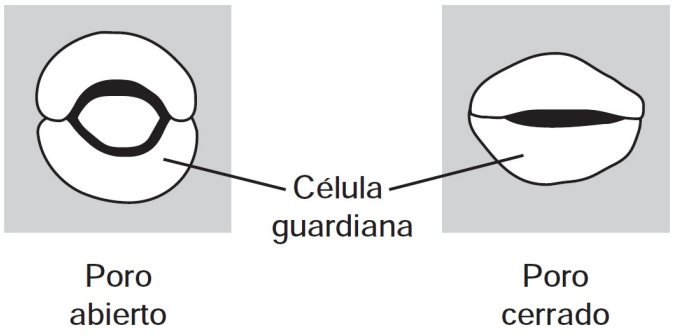
Which statement best explains the results of this experiment?

A) The rate of photosynthesis is affected by variations in the light.
B) In all environments light is a vital resource.
C) The activities of bacteria and algae are not related.
D) Uneven numbers and types of species can upset ecosystem stability.

30. By which process are CO_2 and H_2O converted to carbohydrates?

A) transpiration
B) respiration
C) fermentation
D) photosynthesis

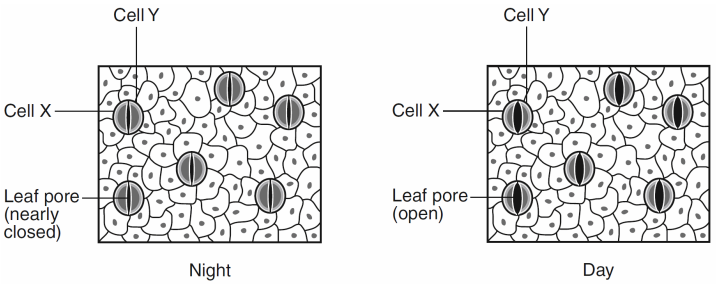
31. The diagram below represents a change in guard cells that open and close pores in a plant.



This change directly helps to

A) increase heterotrophic nutrition
B) absorb minerals
C) regulate water loss
D) reduce seed production

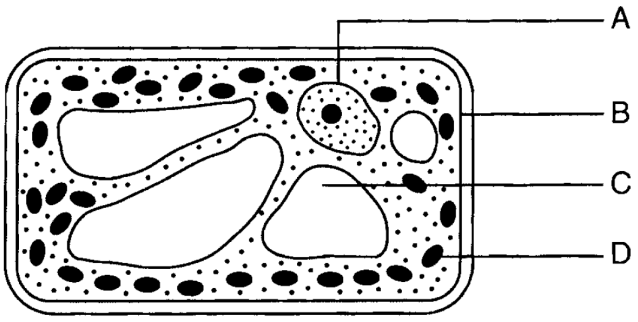
32. The diagram below represents changes in the sizes of openings present in leaves as a result of the actions of cells *X* and *Y*.



The actions of cells *X* and *Y* help the plant to

A) maintain homeostasis by controlling water loss
B) store excess heat during the day and remove the heat at night
C) absorb light energy necessary for cellular respiration
D) detect changes in the biotic factors present in the environmen

33. The cell represented below produces oxygen.



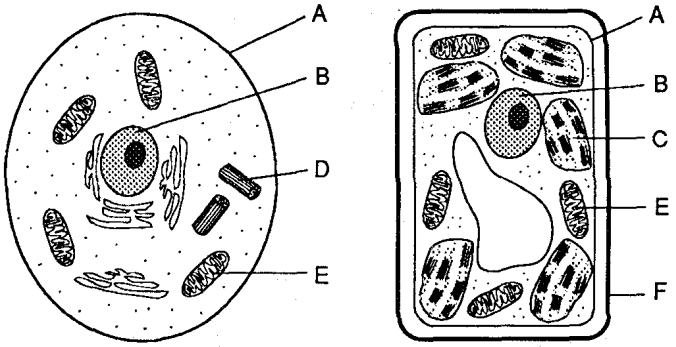
Which structure allows the passage of this oxygen to the environment?

A) *A* B) *B* C) *C* D) *D*

34. Which organelle is the site of cellular respiration?

A) endoplasmic reticulum
B) mitochondria
C) ribosomes
D) chloroplast function

35. Base your answer to the following question on the diagrams below which represent two different cells.

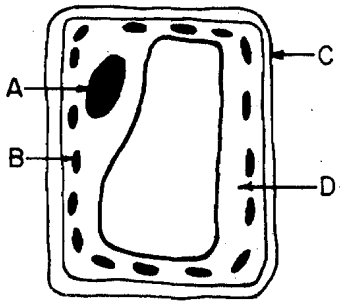


CELL I CELL II

In both cells, the organelles labeled *E* are the sites of

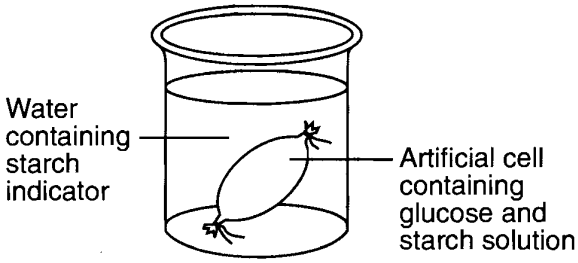
A) secretion B) starch synthesis
C) aerobic respiration D) food storage

36. Which structures in the diagram below enable the observer to identify it as a plant cell?



A) *A* and *B*
B) *B* and *C*
C) *A* and *C*
D) *B* and *D*

37. Base your answer to the following question on the laboratory setup illustrated below and on your knowledge of biology.

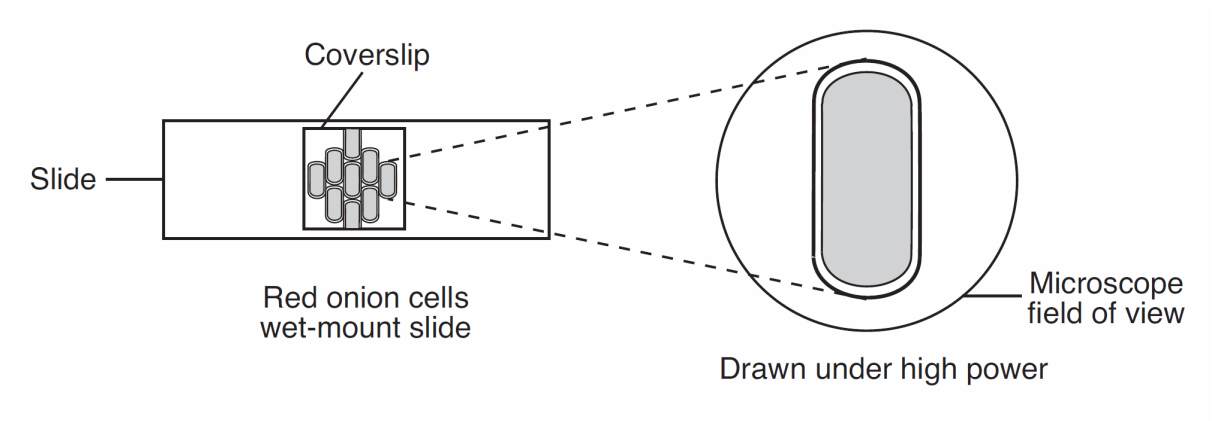


This laboratory setup would most likely be used to demonstrate

A) carbohydrate synthesis
B) active transport
C) diffusion
D) dehydration

38. Base your answer to the following question on the information below and on your knowledge of biology.

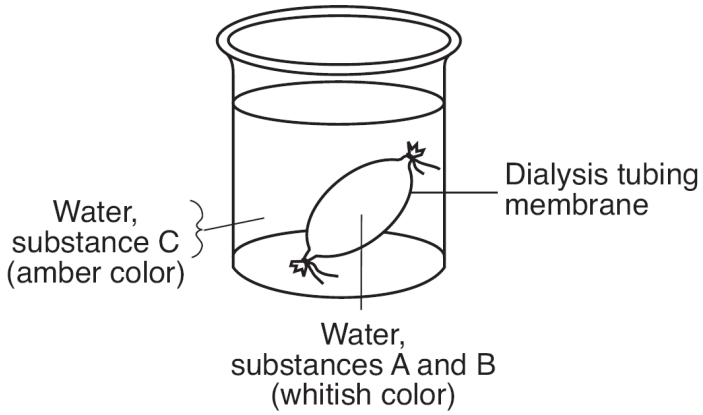
A wet-mount slide of red onion cells is studied using a compound light microscope. A drawing of one of the cells as seen under high power is shown below.



Describe the proper way to add a saltwater solution to the cells without removing the coverslip.

39. Base your answer to the following question on the following experiment.

A model of a cell is prepared and placed in a beaker of fluid as shown in the diagram below. The letters *A*, *B*, and *C* represent substances in the initial experimental setup.



The table below summarizes the content and appearance of the cell model and beaker after 20 minutes.

Results After 20 Minutes

	Outside of Cell Model	Inside of Cell Model
Substances	water, A, C	water, A, B, C
Color	amber	blue black

Identify substance *B* and explain why it did *not* move out of the model cell.

40. Base your answer to the following question on the diagrams below and on your knowledge of biology.

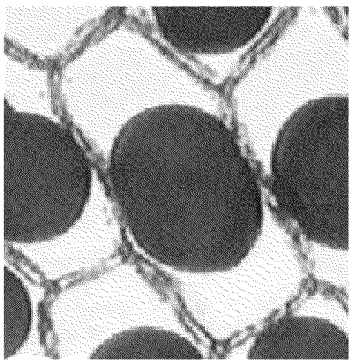


Diagram 1: red onion cells

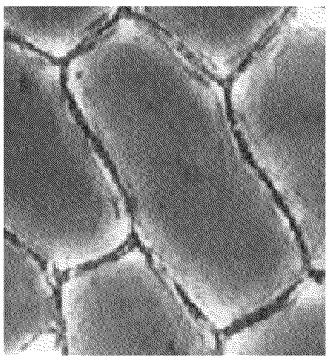


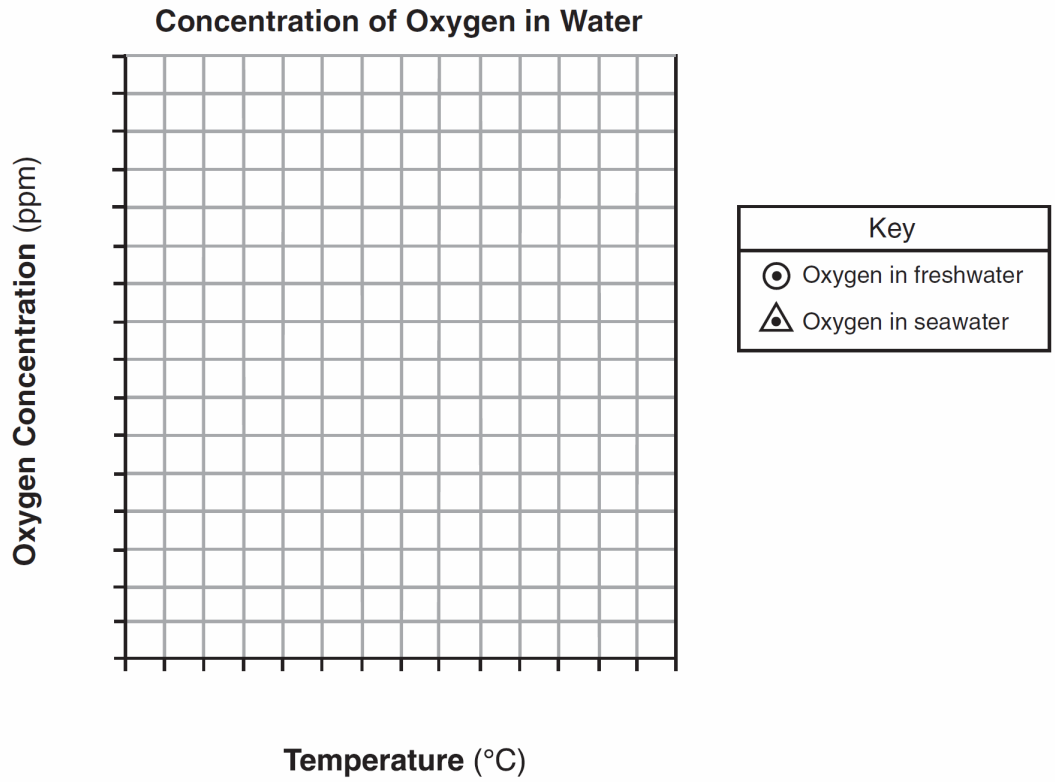
Diagram 2: red onion cells

List the laboratory procedures to follow that would cause the cells in diagram 1 to resemble the cells in diagram 2.

Base your answers to questions **41** through **43** on the data table below and on your knowledge of biology. The data table shows the concentrations of oxygen in parts per million (ppm) present in freshwater and seawater at various temperatures.

Concentration of Oxygen in Water

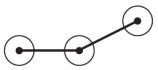
Temperature (°C)	**Oxygen Concentration in Freshwater** (ppm)	**Oxygen Concentration in Seawater** (ppm)
1	14.0	11.0
10	11.5	9.0
15	10.0	8.0
20	9.0	7.5
25	8.0	7.0
30	7.5	6.0



41. Plot the data for seawater oxygen concentration on the grid. Surround each point with a small triangle and connect the points.

Example: 

42. Plot the data for freshwater oxygen concentration on the grid. Surround each point with a small circle and connect the points.

Example: 

43. Mark an appropriate scale on each labeled axis.

Biology (Living Environment)

Name _____ Class _____ Date _____

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