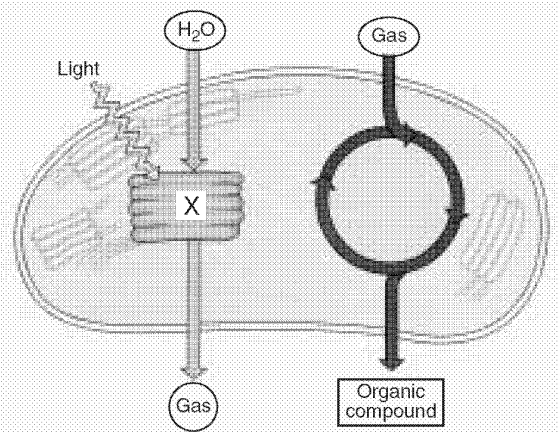


Photosynthesis Star 3

Name: _____

Date: _____

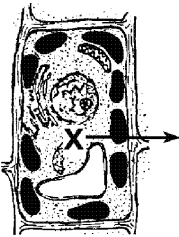
1. The accompanying diagram represents part of a life process in a leaf chloroplast.



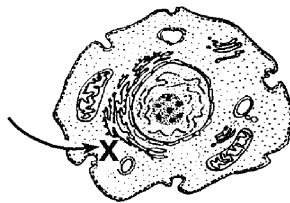
If the process illustrated in the diagram is interrupted by a chemical at point X, there would be an immediate effect on the release of

- A. chlorophyll B. nitrogen
C. carbon dioxide D. oxygen

2. Base your answer(s) to the following question(s) on the two different cells shown below. Only cell A produces substance X. Both cells A and B use substance X.



Cell A



Cell B

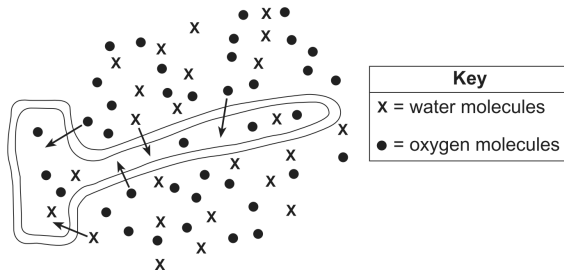
Identify substance X.

3. Identify the type of organelle in cell A that produces substance X.

4. Global warming has been linked to a *decrease* in the

- A. size of the polar ice caps
B. temperature of Earth
C. rate of species extinction
D. rate of carbon dioxide production

5. The diagram below represents a specialized cell located in the root of a plant. The arrows in the diagram indicate the movement of molecules of oxygen and water into the cell.



Which row in the chart below correctly identifies the process responsible for the movement of each type of molecule represented in the diagram?

Row	Water	Oxygen
(1)	diffusion	active transport
(2)	diffusion	diffusion
(3)	active transport	diffusion
(4)	active transport	active transport

- A. (1) B. (2) C. (3) D. (4)

6. Base your answer(s) to the following question(s) on the information below and on your knowledge of biology.

The Control of Transpiration

Plants normally lose water from openings (stomates) in their leaves. The water loss typically occurs during daylight hours when plants are exposed to the Sun. This water loss, known as transpiration, is both beneficial and harmful to plants.

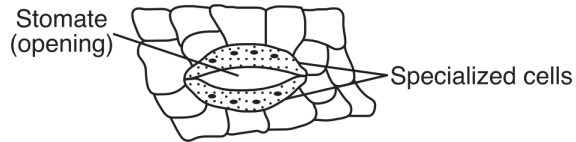
Scientists believe wind and high temperatures increase the rate of transpiration, but the size of each stomate opening can be regulated. Reducing the size of the openings during drought conditions may help reduce the dehydration and wilting that would otherwise occur.

A leaf may lose more than its own weight in water each day. Transpiration also lowers the internal temperature of the leaf as water evaporates. On hot days, temperatures in the leaves may be from 3° to 15°C cooler than the outside air. With stomates open, vital gases may be exchanged between the leaf tissues and the outside environment.

Researchers have also found many plants that use another response when leaf temperatures rise. Special molecules known as heat shock proteins are produced by plant cells and help to hold enzymes in their functional shapes.

Identify two of the “vital gases” that are exchanged between leaf tissues and the outside environment.

7. The diagram below represents specialized cells in the surface of the leaf of a green plant.



The main function of these cells is to

- A. change the size of the stomate to regulate water loss
- B. close the stomate to keep dust and dirt out of the leaf
- C. directly provide leaf cells with the water involved in photosynthesis
- D. allow newly formed glucose to be released from the leaf

8. Base your answer(s) to the following question(s) on the information below and on your knowledge of biology.

One of the effects of Hurricane Katrina, which devastated New Orleans in 2005, was the death of almost all of the plants in flooded areas. Initially, toxic chemicals and bacteria were suspected as a possible cause. Scientists later determined that the salt concentration in the floodwater caused the plants to die.

Identify the process responsible for the effect that the salt water had on the plants.

9. Base your answers to the following question(s) on the information below and on your knowledge of biology.

The sequences below represent the same portions of a DNA molecule from the same gene used by a student to study the relationship between two plant species. A biological catalyst that recognizes the CCGG site is used to cut the DNA molecules into pieces. The catalyst cuts the DNA between the C and G of the site.

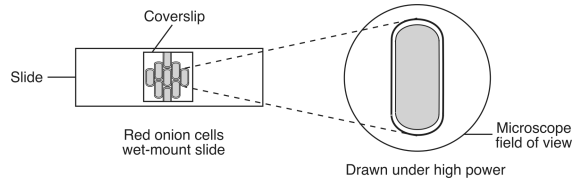
Species 1: T A C C G G A T T A G
T T A T G C C G G A T C G

Species 2: T A C G G A T G C C G
G A T C G G A A A T T C G

Are the two species of plants closely related? Support your answer.

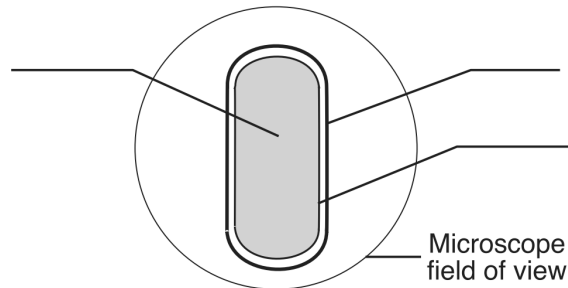
10. Base your answer(s) to the following question(s) on the information below and on your knowledge of biology.

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.



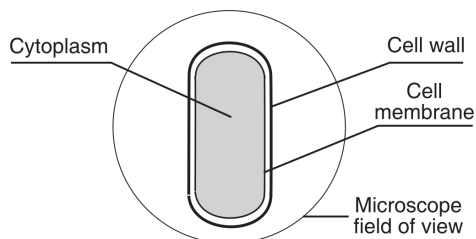
On the diagram below, label the location of each of the cell structures listed.

cell wall
cytoplasm
cell membrane



1.
Answer: D
2.
Answer: oxygen or glucose or sugar
3.
Answer: chloroplast
4.
Answer: A
5.
Answer: B
6.
Answer: Acceptable responses include, but are not limited to: – oxygen – water vapor – carbon dioxide
7.
Answer: A
8.
Answer: Acceptable responses include, but are not limited to:
 - diffusion
 - osmosis
 - dehydration
9.
Answer:
 - No, the biological catalyst made two cuts in species 1 DNA and only one cut in species 2 DNA.
 - No, the catalyst cut the DNA of species 1 into three pieces and cut the DNA of species 2 into only two.
 - No, 15 out of 24 bases are different.
 - No, the base sequences are very different.

10.
Answer: Credit for labeling the locations of the cell wall and the cell membrane and cytoplasm on the diagram.



Note: All three must be correctly labeled to receive this credit.