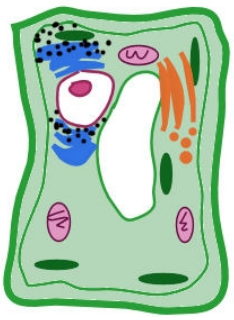
TEKS 4A – compare and contrast prokaryotic and eukaryotic cells

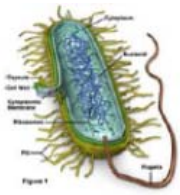
1. Which of these is the best model of a prokaryotic cell?

A



B

C



D

All of the Above

2. Loriciferans are microscopic multicellular animals that live in various marine sediments. Scientists have discovered genera of Loriciferans in a deep-sea habitat that lacks oxygen. Before this discovery, some prokaryotes and some unicellular eukaryotes were known to inhabit anaerobic environments. Among the newly discovered Loriciferans is *Spinoloricus* sp. nov., which is pictured below.

Spinoloricus sp. nov.

Scientists determined that organisms of the genus *Spinoloricus* were eukaryotes and not prokaryotes because *Spinoloricus* cells have –

A flagella

B hereditary material

C cell walls

D nuclear membranes

3. Melinda had two slides of unknown cells. She recorded her observations of each one on the chart below.

Cell Part Found	Cell *X*	Cell *Y*
Cell membrane	✓	✓
Nucleus	✓	✓
Cytoplasm	✓	✓
Cell wall		✓
Mitochondrion	✓	✓
Vacuole	✓	✓
Chloroplast		✓
Ribosome	✓	✓

According to the information in the given chart, what type of cell is cell ***X***?

A bacteria cell

B prokaryotic cell

C plant cell

D animal cell

4. The simplicity of prokaryotic cells prevents them from

A growing and reproducing.

B responding to their environment.

C forming specialized tissues and organs.

D moving through their environment.

TEKS 4B – investigate and explain cellular processes, including homeostasis, energy conversions, transport of molecules, and synthesis of new molecules

5. Which of these is a function of the cell membrane in all cells?

A Producing cellular nutrients

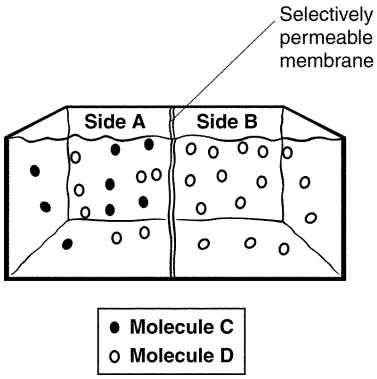
B Maintaining homeostasis

C Neutralizing chemicals

D Preserving cellular wastes

6. A student put together the experimental setup shown below. The selectively permeable membrane is permeable to both types of solute molecules shown.

How would you expect the molecules to change over time in the diagram?



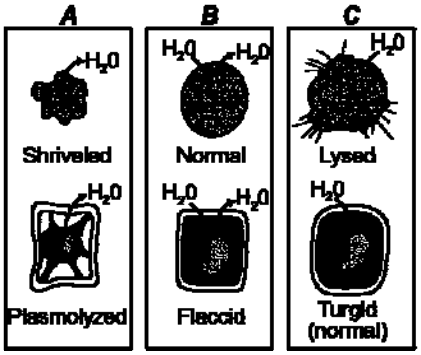
A Both types of molecules will move to reach equilibrium.

B All of Molecule D will move to side B.

C All of Molecule C will move to side B.

D There will be no change over time.

7. The diagram given shows animal and plant cells placed in 3 different types of solutions. What type of solution is represented by diagram ***C*** ?



A Isotonic

B Hypertonic

C Hypotonic

D Hydrotonic

8. A student placed 2 eggs in vinegar to dissolve the egg shells. In order to investigate osmosis, he then placed the equal-sized eggs in the solutions listed in the table.

Osmosis Lab Data Table

Solution	Initial mass of egg	Final mass of egg
Corn syrup	80g	60g
Distilled water	80g	100g

What can you conclude about the solutions from the change in mass of the eggs?

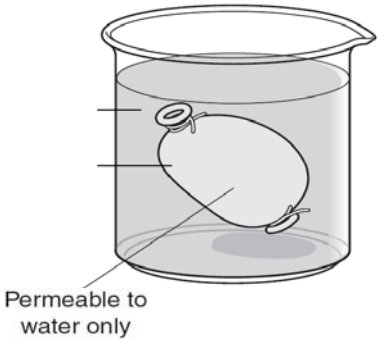
A Corn syrup is a hypotonic solution and distilled water is a hypertonic solution.

B Corn syrup is a hypertonic solution and distilled water is a hypotonic solution.

C Corn syrup is a hypertonic solution and distilled water is an isotonic solution.

D Both corn syrup and distilled water are isotonic solutions.

9. The image below represents a cell with a semipermeable membrane.



The process of osmosis would explain the net movement of water *into* a cell if the initial percentage of –

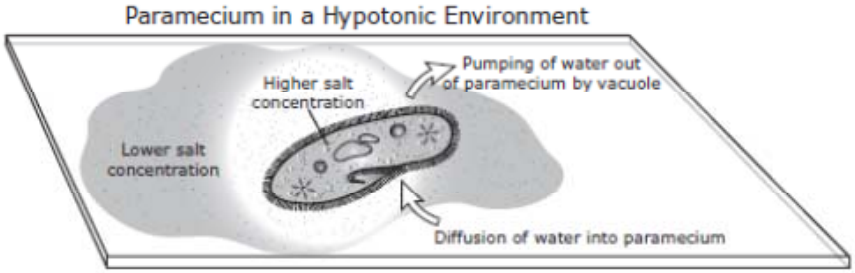
A protein was 35% inside the cell and 30% outside the cell.

B water was 95% inside the cell and 90% outside the cell.

C water was 90% inside the cell and 95% outside the cell.

D protein was 30% inside the cell and 35% outside the cell.

10. The diagram below shows how a paramecium maintains homeostasis. A paramecium normally lives in a hypotonic environment in which water continually diffuses into the cell. To maintain homeostasis, the paramecium must pump out large amounts of water using its contractile vacuole.



If the paramecium is placed in this hypotonic environment, which of the following will occur?

A Water will diffuse into the paramecium.

B Water will diffuse out of the paramecium.

C Salt will be pumped out of the paramecium by the vacuole.

D Salt will be pumped into the paramecium by the vacuole.

11. The diagram below represents a white blood cell engulfing some bacteria. Which of the following statements is true in regards to this process?

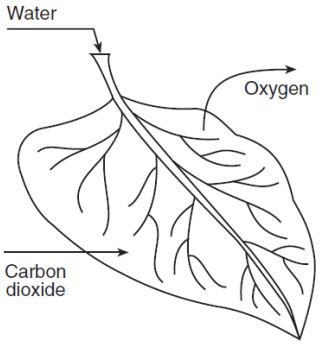
A This represents exocytosis (active transport) and requires energy.

B This represents facilitated diffusion and no energy is required.

C This represents endocytosis (active transport) and requires energy.

D This represents diffusion and no energy is required.

12. The arrows in the diagram below represent the movement of materials. This movement of materials indicated by the arrows is most directly involved in the processes of



A respiration and replication

B photosynthesis and excretion

C digestion and recycling

D circulation and coordination

13. Which statement best describes cellular respiration?

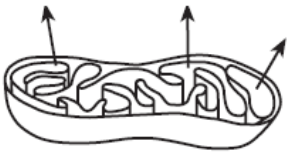
A It occurs in animal cells but not in plant cells.

B It converts energy in glucose into a more usable form of energy.

C It uses carbon dioxide and produces oxygen.

D It stores energy in food molecules.

14. The diagram below represents a structure involved in cellular respiration. The release of which substance is represented by the arrows?



Mitochondrion

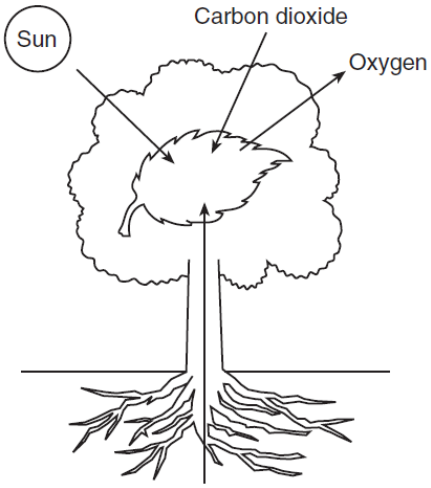
A glucose

B carbon dioxide

C oxygen

D DNA

15. 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.

16. Energy from organic molecules can be stored in ATP molecules as a direct result of the process of

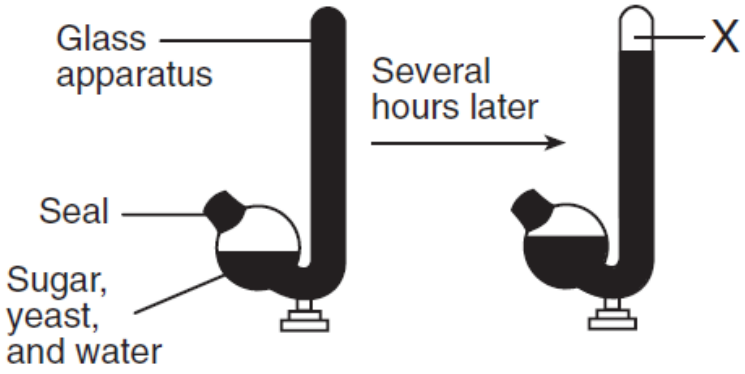
A cellular respiration

B cellular reproduction

C diffusion

D digestion

17. An investigation was carried out and the results are shown below. Substance *X* resulted from a metabolic process that produces ATP in yeast (a single-celled fungus).



Which statement best describes substance *X*?

A It is oxygen released by protein synthesis.

B It is glucose that was produced in photosynthesis.

C It is starch that was produced during digestion.

D It is carbon dioxide released by respiration.

TEKS 5B – examine specialized cells, including roots, stems, and leaves of plants; and animal cells such as blood, muscle, and epithelium

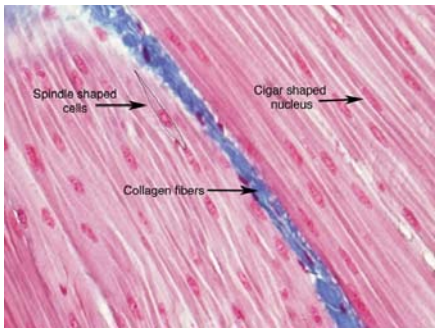
18. Examine the following specialized muscle cells found in animals. Why would it be necessary for a muscle cell to have a higher percentage of mitochondria than other cells in the body?

A To make proteins

B To provide energy for movement

C To store water and nutrients

D To convert light energy into carbohydrates



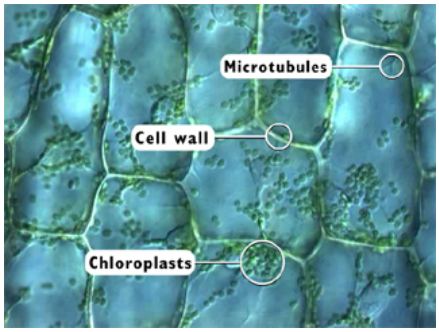
19. Examine the following specialized cells found in leaves of plants. Why would it be necessary for a leaf cell to have lots of chloroplasts?

A To convert light energy into carbohydrates

B To provide energy for movement

C To store water and nutrients

D To make proteins



20. Which tissue in plants is similar in function to the integumentary system in humans?

A epidermal tissue

B vascular tissue

C ground tissue

D meristematic tissue

TEKS 9B – compare the reactants and products of photosynthesis and cellular respiration in terms of energy and matter

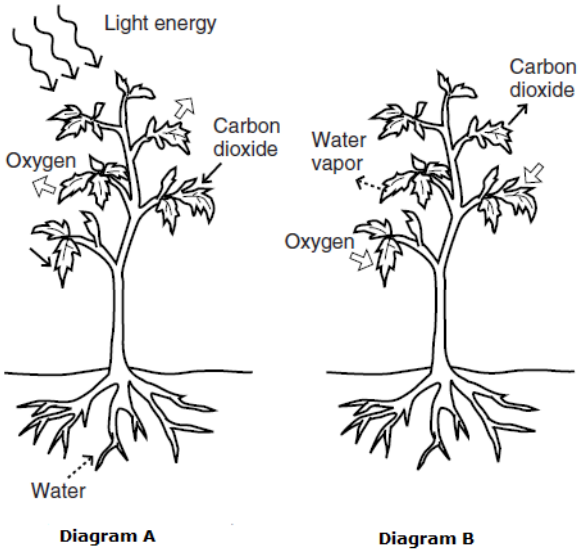
21. Which equation belongs with diagram A?

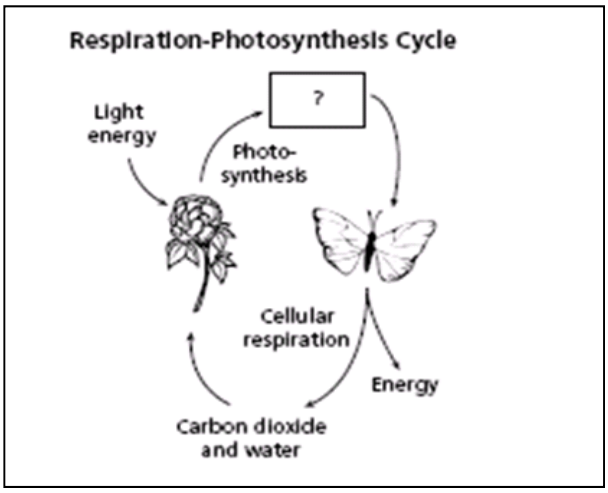
A $6\ O_2 + C_6H_{12}O_6 + \text{energy} \rightarrow 6\ CO_2 + 6\ H_2O$

B $6\ CO_2 + 6\ H_2O + \text{energy} \rightarrow 6\ O_2 + C_6H_{12}O_6$

C $6\ O_2 + C_6H_{12}O_6 \rightarrow 6\ CO_2 + 6\ H_2O + \text{energy}$

D $6\ O_2 + C_6H_{12}O_6 + \text{energy} \rightarrow 6\ CO_2 + 6\ H_2O$





22. What products of photosynthesis and reactants for respiration belong in the box to complete the cycle?

A Hormones

B Chlorophyll a and chlorophyll b

C ATP and ADP

D Glucose and oxygen

Comparison of photosynthesis and respiration

Description A	Description B
Produces sugars from energy	Burns sugars for energy
Energy is stored	Energy is released
Occurs only in cells with chloroplasts	Occurs in most cells
Oxygen is produced	Oxygen is used
Water is used	Water is produced
Carbon dioxide is used	Carbon dioxide is produced
Requires light	Occurs in dark and light

23. The process described in description B occurs in -

A plant cells only

B animal cells only

C both plants and animal cells

D all but plant cells

24. Plants and animals exchange materials through the processes of photosynthesis and respiration. Which of these statements is true about the way these two processes are related?

A The products of photosynthesis inhibit respiration.

B The products of photosynthesis are also the products of respiration.

C The reactants of photosynthesis are also the reactants of respiration.

D The products of photosynthesis are the reactants of respiration.