

Applied Practice

***Cells and Viruses***  
***STAAR Biology EOC***

**RESOURCE GUIDE**

**Volume 1**

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**STAAR Biology EOC**

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# Teacher Notes and Glossary

## ***Cells and Viruses***



## Glossary of Terms

**Active Transport** – the movement of molecules into or out of a cell against a concentration gradient. It requires the cell to use cellular energy (ATP) to move the molecules.

**Adenosine diphosphate (ADP)** – the product of ATP dephosphorylation.

**Adenosine triphosphate (ATP)** – a molecule found in organisms that serves as the primary source for energy within cells for metabolism. ATP is often called the “energy currency” for cellular processes. ATP consists of an adenine nucleotide, a ribose sugar, and three phosphate groups.

**Autotroph** – an organism that can produce complex organic compounds such as carbohydrates which are used as food for all organisms.

**Bacteriophage** – a virus that infects and replicates within a bacteria.

**Capsid** – the protein shell of a virus.

**Cellular Respiration** – a series of biological reactions that take place in the cells of organisms to convert stored chemical energy from sugar into the bonds of ATP.

**Cellulose** – an organic polysaccharide consisting of many linear chains of D-glucose units. It is the primary structural component of the cell wall of plants and many forms of algae.

**Cell Wall** – a tough rigid layer that surrounds some types of cells. It is located outside of the cell membrane and provides cells with structural support and protection. A major function is to act against an increase in cellular pressure, preventing over-expansion of the cell membrane when water enters the cell.

**Chitin** – a polymer of glucose derivatives that is the main component of cell walls of fungi and makes up the exoskeleton of arthropods, crustaceans, and insects.

**Chlorophyll** – a green pigment found in autotrophic organisms. It is an important molecule, involved in photosynthesis, which allows photosynthetic autotrophs to absorb energy from sunlight.

**Chloroplast** – an organelle found in plant cells and some other eukaryotic organisms. It is the primary location for photosynthesis in plant cells.

**Cholesterol** – an organic molecule that is an essential component of animal cell membranes. It allows the membrane to maintain proper membrane permeability and fluidity.

**Chromosome** – an organized structure of DNA and proteins found in cells.

**Concentration Gradient** – a difference in the concentration of a dissolved substance in solution on opposite sides of a semi-permeable membrane.

**Dehydration Synthesis** – the formation of chemical bonds by the removal of water.





# Student Practices

## ***Cells and Viruses***



Choose the best answer to each question.

Use the table below to answer questions 1-4.

	Organism A	Organism B	Organism C	Organism D
<b>Nucleus</b>	Yes	*Undetermined	No	*Undetermined
<b>DNA</b>	Yes	Yes	Yes	Yes
<b>Cell wall</b>	No	Cell wall composed of cellulose	*Undetermined	Cell wall composed of peptidoglycan
<b>Ribosomes</b>	Yes	Yes	*Undetermined	Yes
<b>Chlorophyll</b>	*Undetermined	Yes	No	Yes
<b>Mitochondria</b>	Yes	Yes	No	*Undetermined

1 Compare the features of the organisms listed in the table above. Which of the organisms could be prokaryotes?

- A Organism B only
- B Organism C only
- C Organisms A and B
- D Organisms C and D

---

2 Organism A could be a(n) —

- F tree
- G butterfly
- H yeast
- J *E. coli*

3 Organism C could not be a(n) —

- A prokaryote
  - B *E.coli*
  - C yeast
  - D eubacteria
- 

4 Organisms which are definitely autotrophic include —

- F Organisms A and B
  - G Organisms B and C
  - H Organisms B and D
  - J Organisms A, B, and D
- 

5 Which is an organelle common to both plant cells and animal cells?

- A Cell wall
- B Chloroplast
- C Mitochondria
- D Central vacuole

- 6 The presence of which organelle distinguishes a prokaryotic cell from a eukaryotic cell?
- F Nucleus
  - G Ribosome
  - H Flagella
  - J Cell membrane
- 

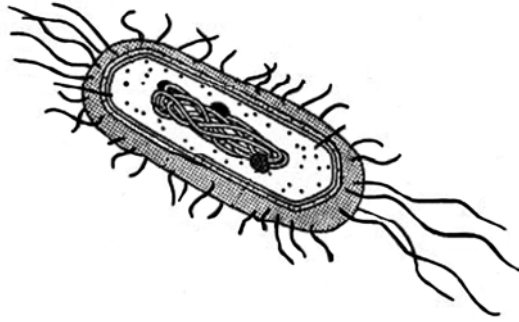
- 7 Which of the following observations comparing the structure and function of cells may NOT be made using a light microscope?
- A Plant cells differ from animal cells in that they contain chloroplasts to carry out photosynthesis.
  - B Some eukaryotic cells are unicellular; others are multicellular.
  - C Prokaryotic cells are much smaller than eukaryotic cells.
  - D The two types of prokaryotic cells differ in their cell wall composition.
- 

Examine the diagram of a cell pictured below to answer question 8.



- 8 Based on the structures pictured in the cell above, in which organism would you most likely find this type of cell?
- F Plant
  - G Animal
  - H Fungi
  - J Bacteria

Use the illustration of a cell below to answer question 9.



9 Based on the observable structures in the illustration, the cell in the above diagram is most likely —

- A a eukaryotic cell because it has flagella
- B a eukaryotic cell because it contains genetic material
- C a prokaryotic cell because it lacks a membrane-bound nucleus
- D none of these

---

10 Organelles common to both prokaryotic and eukaryotic cells can include —

- F Cell Walls, Mitochondria, Cell Membranes
- G Lysosomes, Cell Membranes, Ribosomes
- H Cell Walls, Chloroplasts, Golgi Bodies
- J Cell Membranes, Ribosomes, Cell Walls