ملخص وشرح الدرس الثاني Function and Structure Cell بنية الخلية ووظيفتها المسار المتقدم

المزيد من الملفات بحسب الصف السادس والمادة علوم في الفصل الأول

1	ملخص وشرح الدرس الأول Life Exploring المسار المتقدم
2	ملخص وشرح الدرس الرابع Materials Moving نقل المواد المسار المتقدم
3	ملخص وشرح الدرس الثالث and energy Obtaining المسار النفايات وإزالة الطاقة على الحصول removing waste

المزيد من الملفات بحسب الصف السادس والمادة علوم في الفصل الأول	
	المتقدم
4	ملخص وشرح الدرس الثاني Support and Structure التركيب والدعم المسار المتقدم
5	ملخص وشرح الدرس الثالث organization of Levels مستويات التنظيم المسار المتقدم

Mr. Ahmed Elhddad

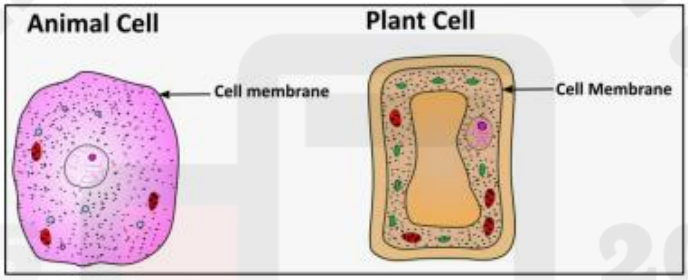
0544557773

Cell Structure and Function

Inspire Science

1- Cell membrane

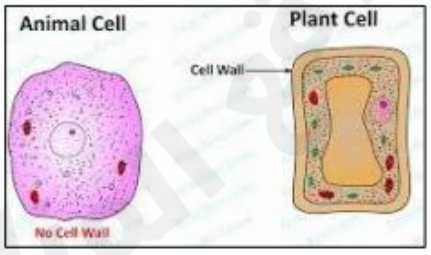
- **Every cell** is surrounded by a protective boundary called a cell **membrane.**
- The **cell membrane** is a flexible covering that protects the inside of a cell from the environment outside a cell.
- A cell membrane is semipermeable – it allows only nutrients to enter and wastes to leave a cell
- The **important role of cell membrane** is to control the movement of a substance into and out of cells

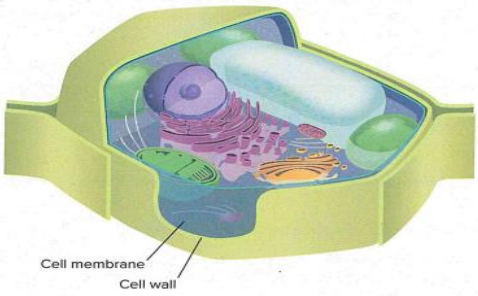


2- The **cytoplasm** is a fluid inside a cell that contains salts and other molecules

3- Cell Wall

- The cell wall is a stiff structure **outside** the cell membrane
- Cell walls provide structure and help protect the cell from the outside environment (attack by viruses and other harmful organisms).





Mr. Ahmed Elhddad

0544557773

➢ **Surface Area and volume:**

1- When a cell grows, both its surface area and its volume increase.

2- However, the volume of the cell increases faster than its surface area.

3- If a cell becomes too large, it will need large amounts of nutrients.

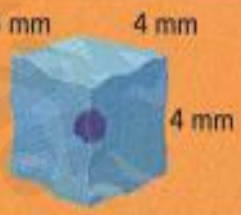
4- It would produce large amounts of waste material.

5- Its surface area would be too small to move enough nutrients into the cell and remove all the waste materials from the cell.

Surface area $= \ell \times w \times 6$

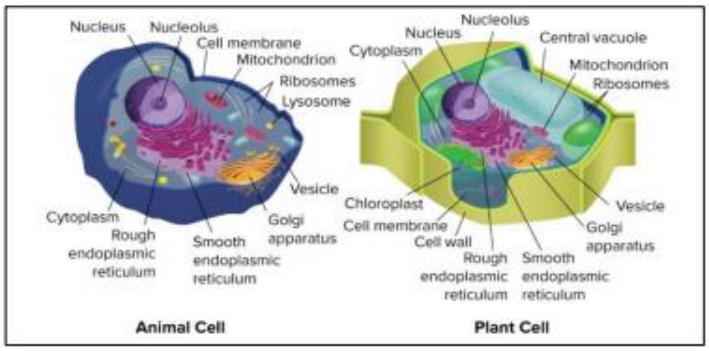
Volume $= \ell \times w \times h$

$\frac{\text{Surface area}}{\text{Volume}}$

		
Length	1 mm	4 mm
Width	1 mm	4 mm
Height	1 mm	4 mm
Number of Sides	6	?
Surface Area ($\ell \times w \times$ no. of sides)	$1\text{ mm} \times 1\text{ mm} \times 6 = ?\ \text{mm}^2$	$4\text{ mm} \times 4\text{ mm} \times 6 = 96\ \text{mm}^2$
Volume ($\ell \times w \times h$)	$1\text{ mm} \times 1\text{ mm} \times 1\text{ mm} = 1\ \text{mm}^3$	$4\text{ mm} \times 4\text{ mm} \times 4\text{ mm} = ?\ \text{mm}^3$
Surface-area-to-volume ratio	$\frac{6\ \text{mm}^2}{1\ \text{mm}^3} = \frac{6}{1}$ or ? :1	$\frac{96\ \text{mm}^2}{64\ \text{mm}^3} = \frac{1.5}{1}$ or 1.5:1

Mr. Ahmed Elhddad

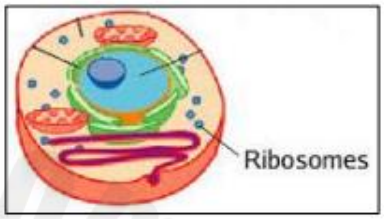
0544557773



4- Ribosomes

- Some proteins help cells communicate with each other.
- Some proteins transport substances inside cells.

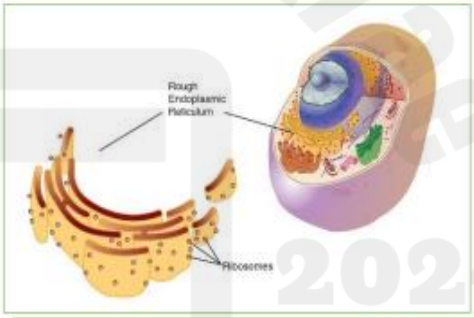
➢ Proteins are made on small organelles called **ribosomes**. A ribosome is not surrounded by a membrane

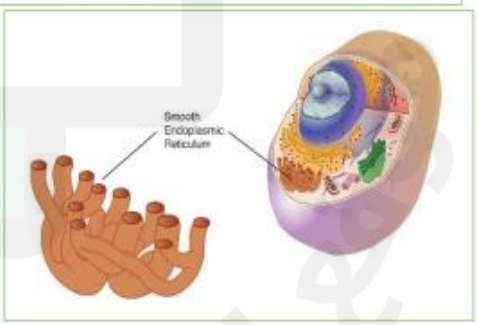


5-Endoplasmic Reticulum

- Ribosomes can be attached to an organelle called the endoplasmic reticulum, or ER.

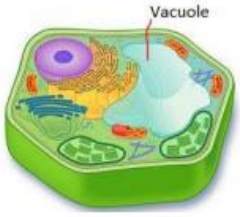
Rough Endoplasmic Reticulum	Smooth Endoplasmic Reticulum
With ribosomes on its surface	without ribosomes on its surface
Produce proteins	helps remove harmful substances from a cell

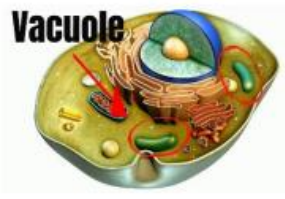




6-Vacuoles

- Vacuoles are organelles that store food, water, and waste materials in a cell.
- **Plant cells usually have one large vacuole.**
- Vacuoles help support the plant. / Some animal cells have many small vacuoles

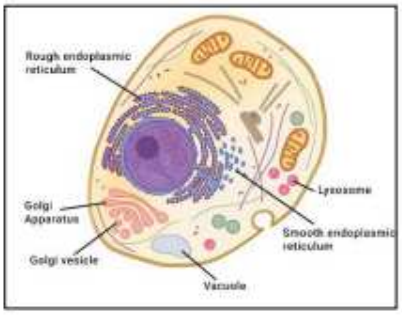




Mr. Ahmed Elhddad

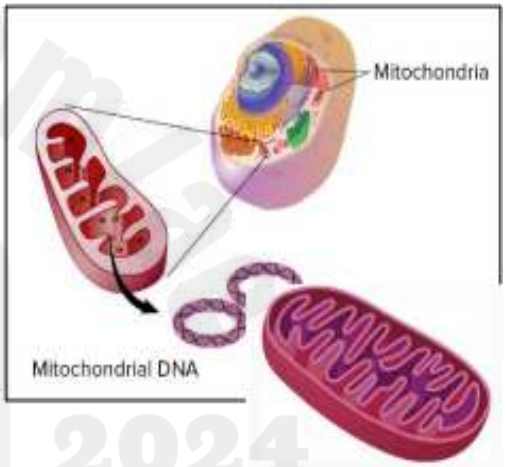
0544557773

7-The Golgi Apparatus



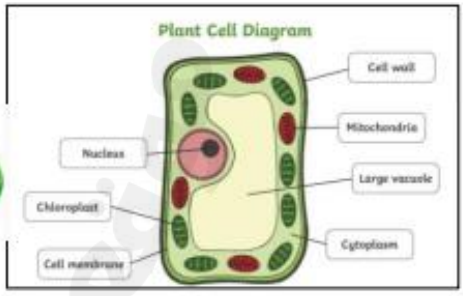
- The Golgi apparatus is an organelle that gets proteins ready for their specific jobs.
- It then packages the proteins into tiny membrane-bound, ball-like structures **called vesicles.**
- **Vesicles are organelles that transport substances to other parts of the cell.**
- Some vesicles in an animal cell **are called lysosomes.**
- **Lysosomes help break down and recycle different parts of the cell.**

8-Mitochondria



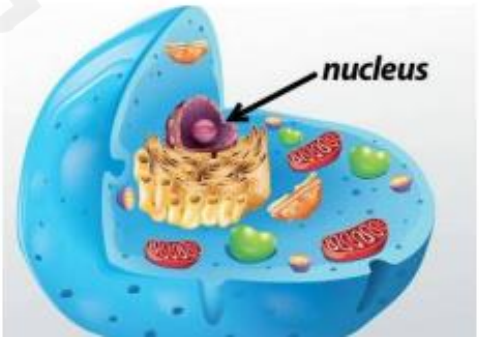
- Mitochondrion is a bean-shaped organelle.
- It is called the powerhouse of cells.
- **Mitochondria are found in both plant and animal cells.**
- Mitochondria are the site of **cellular respiration** – a series of chemical reactions in which food molecules are broken down and the energy **in them is converted to ATP.**

9-Chloroplast



- plant cells contain organelles called chloroplast.
- **Chloroplasts** are organelles that use light energy and make food

10-Nucleus

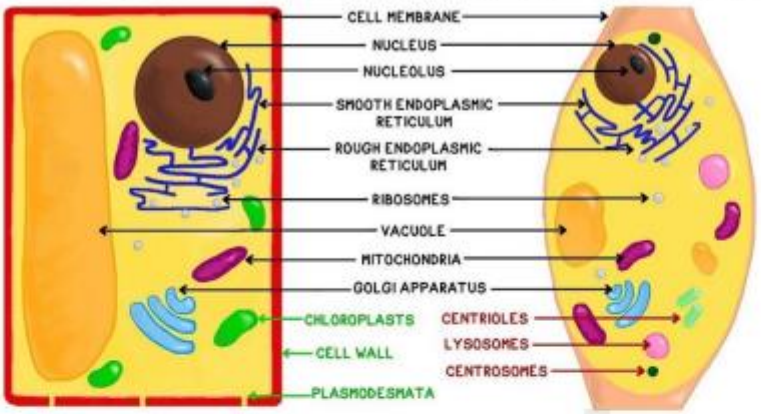


- The largest organelle inside most eukaryotic cells is the nucleus.
- **The nucleus** is the part of a eukaryotic cell that directs cell activities and contains important cellular information stored in DNA.
- DNA is organized into structures called **chromosomes.**
- DNA carries instructions for making all the proteins a cell needs.

Mr. Ahmed Elhddad

0544557773

PLANT VS. ANIMAL CELLS



Organelle	Function	Plant, animal, or both?
Nucleus	Directs cellular activity	Both
Mitochondria	Powers animal cells and plant cells	Both
Chloroplasts	Capture energy for the plant cell	Plant
Cell Wall	Provides structure, support, and protection	Plant
Cell Membrane	Regulates what enters and leaves a cell	Both

- **Red blood cells** are disk-shaped which helps them move through blood vessels and carry oxygen throughout the body.
- **Xylem cells** are tube like cells that transport water from the roots to the leaves of plants.
- **Neurons** are cells found in many animals that transmit information from one part of the body to another

****

Mr. Ahmed Elhddad

0544557773

Review

Organelle	Function	Plant, animal, or both?
Nucleus		
Mitochondria		
Chloroplasts		
Cell Wall		
Cell Membrane		

2. Rosa is planning an investigation using a microscope to try to identify a group of cells. She sees that the cells are joined together, so she knows that they are from one organism. If she also sees that all of the cells have cells walls, Rosa can conclude that she could be looking at

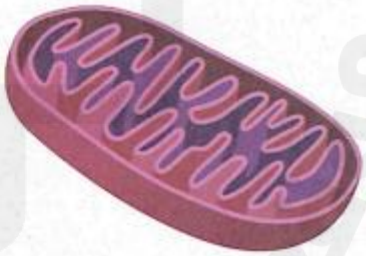
   A bacterial cells.

   B human cells.

   C mouse cells.

   D plant cells.

3. Mitochondria function as subsystems within the larger system of the cell as a whole. Which explains why a mitochondrion, shown on the right, is known as the "power house" of a cell?



   A It converts energy in food to ATP.

   B It helps the cell gather sunlight.

   C The cell eats it as food.

   D It has two membranes.

4. **MATH Connection** Which statement could you use to construct an explanation for why it is important for a cell's surface-area-to-volume ratio to not be too small?

   A Wastes and nutrients need to move through the membrane.

   B If a cell's surface-area-to-volume ratio was too small, the cell would starve.

   C If a cell's surface-area-to-volume ratio was too small, the cell would not produce enough waste material.

   D If a cell's surface-area-to-volume ratio was too small, the organelles would grow too large to fit within the cell.

Mr. Ahmed Elhddad

0544557773

: Compare and contrast, eukaryotic and prokaryotic cells by putting

* bacteria * Cat * Multicellular * no nucleus
* Have a nucleus * have membrane-bound organelles * unicellular
* Do not have membrane-bound organelles * Have Cytoplam – no cytoplasm

Prokaryotic cell	Eukaryotic cell

1. Compare animal and plant cells. Add "Yes" or "No" to show the parts that are alike and different.

Cell Part	Animal Cell	Plant Cell
cell membrane		
nucleus		
chloroplasts		
mitochondria		
cell wall		
cytoplasm		

2. Match the organelles to their function.

Organelle	Function
_1. cell wall	A. rigid structure that protects plant cells
_2. ribosomes	B. controls what enters and exits the cell
_3. chloroplasts	C. use energy from food to produce ATP
_4. vacuoles	D. store water, food, and wastes
5. cell membrane	E. make proteins
_6. mitochondria	F. use sunlight to make food

6. Which of the cells found in plant leaves? (choose any two)
   a. Muscle cells
   b. Palisade cells
   c. Cilia cells
   d. Nerve cells
   e. Root hair cells
   f. Stomata cells
7. ..... absorb water from soil.
8. ..... transport water and minerals in a plant.

****