تغطية اختبار نهاية الفصل – الليبيدات والدهون

تم تحميل هذا الملف من موقع المناهج الإماراتية	
موقع المناهج ⇦ المناهج الإماراتية ⇦ الصف التاسع ⇦ علوم ⇦ الفصل الأول ⇦ ملفات متنوعة ⇦ الملف	
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المزيد من مادة علوم:	ملفات ا كتب للمعلم ا كتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس

التواصل الاجتماعي بحسب الصف التاسع					
صفحة المناهج الإماراتية على فيسبوك					

المزيد من الملفات بحسب الصف التاسع والمادة علوم في الفصل الأول	
1	مذكرة مزودة بأسئلة اختبار من متعدد وأمثلة محلولة على جميع المواضيع
2	انسباير عام - organisms and their relationships
3	أنسباير متقدم - chemical reactions
4	ملزمة تحتوي على شرح دروس الفصل كامل بالإضافة الى تمارين بعد كل درس 2026-2027
5	أسئلة على درس المادة - انسباير

تحميل تطبيق المناهج للهواتف الذكية	
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Q11	BIO.3.1.02.024: Explain that the hydrocarbon backbones of the sugars formed during photosynthesis are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules used, for example, to form new cells.	Figure 32	28

Lipids:

- **Lipids:** are molecules made mostly of carbon and hydrogen that make up the fats, oils, and waxes.
- Lipids are composed of fatty acids, glycerol, and other components. The **primary function** of lipids is to **store energy**.
- A **lipid called a triglyceride** is a fat if it is solid at room temperature and an oil if it is liquid at room temperature.
- In addition, triglycerides are stored in the fat cells of the body.
- Plant leaves are coated with **lipids called waxes** to prevent water loss, and the honeycomb in a beehive is made of beeswax.

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Saturated and unsaturated fats

Saturated fat :-

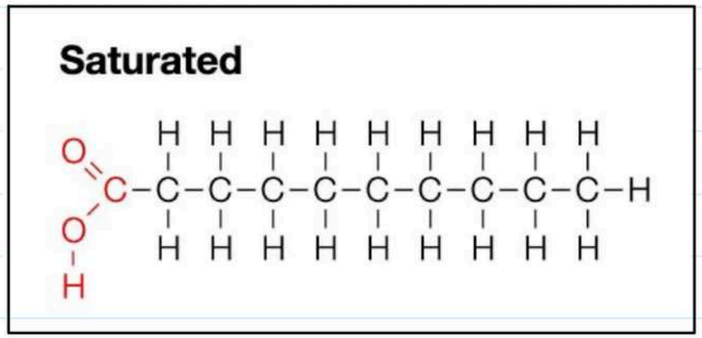
- ☐ all carbon atoms are bonded together by single covalent bond.
- ☐ have straight chain.
- ☐ are solids at room temperature
- ☐ no more hydrogens can bond to the tails.

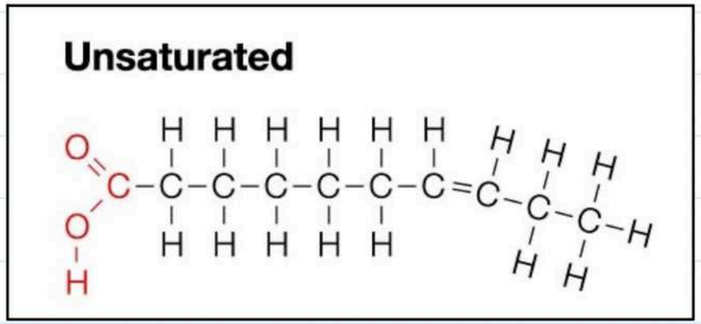
Unsaturated fat :-

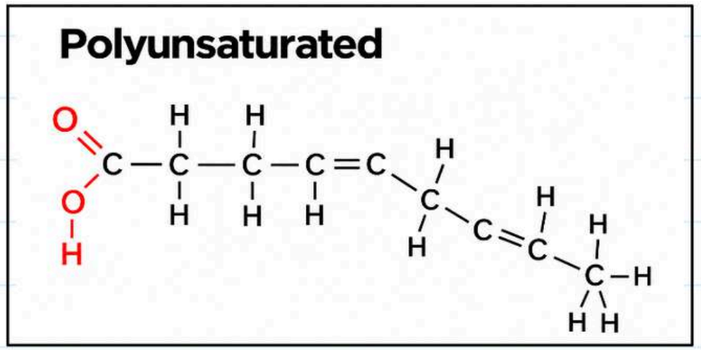
- ☐ have at least one carbon-carbon double bond
- ☐ have kinks in their chains
- ☐ are liquid at room temperature.

Polyunsaturated fats :-

- ☐ Fats with more than one double bond in the tail.







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Phospholipids

- **Phospholipid**: is responsible for the structure and function of the cell membrane. Lipids are hydrophobic, which means they do not dissolve in water.
- This characteristic is important because it allows lipids to serve as barriers in biological membranes.

Steroids

- Steroids Another important category of lipids is the steroid group. Steroids include substances such as cholesterol and hormones.
- Despite its reputation as a "bad" lipid, cholesterol provides the starting point for other necessary lipids such as vitamin D and the hormones estrogen and testosterone.

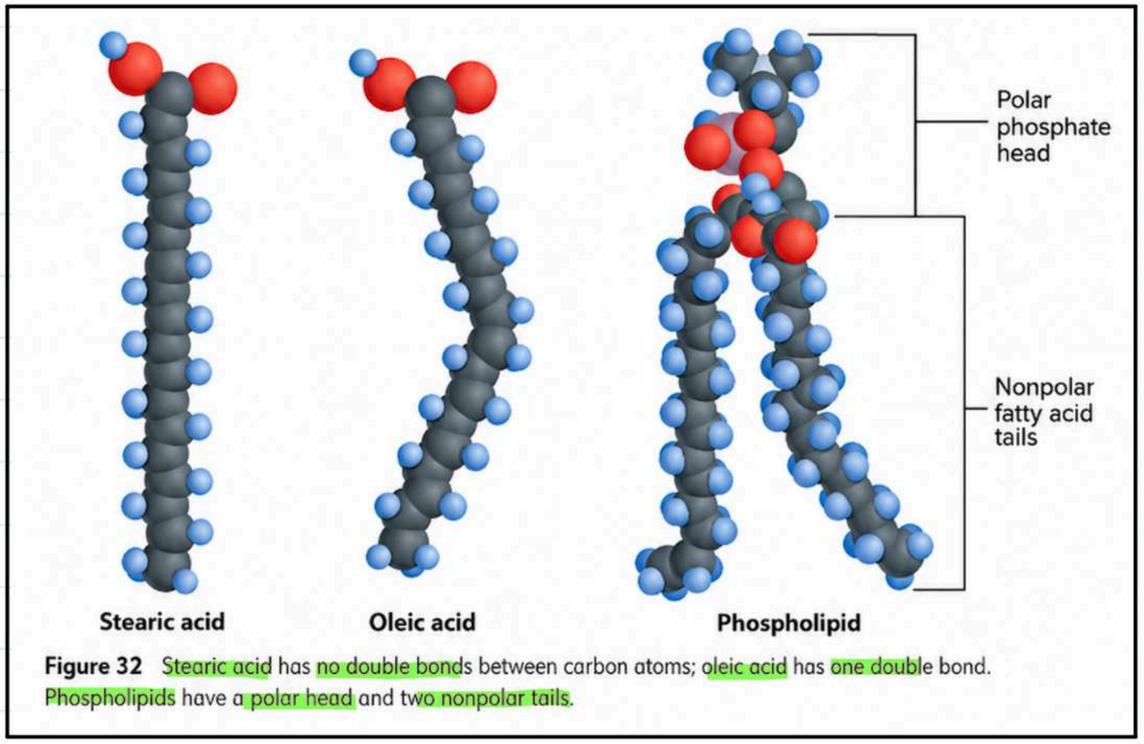


Figure 32 Stearic acid has no double bonds between carbon atoms; oleic acid has one double bond. Phospholipids have a polar head and two nonpolar tails.

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1

What are saturated fats?

A. Lipids with double bonds between carbon atoms.	**B.** Proteins with double bonds between carbon atoms.	**C.** Lipids with single bonds between carbon atoms.	**D.** Proteins with single bond between carbon atom.

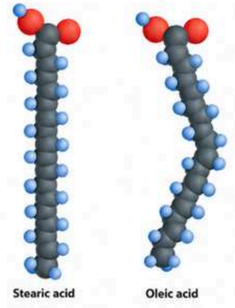
2

Which of the following is attributed to lipids;

A. Speed reaction.	**B.** Control cell growth.	**C.** Energy Storage.	**D.** Genetic information storage

3

Based on Figure, which molecule is unsaturated?



A. Stearic acid	**B.** Oleic acid	**C.** both	**D.** none

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Q12	BIO.3.1.02.024: Explain that the hydrocarbon backbones of the sugars formed during photosynthesis are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules used, for example, to form new cells.	Get It	29

Proteins

- A protein is a compound made of small carbon compounds called amino acids.
- Amino acids are small compounds that are made of carbon, nitrogen, oxygen, hydrogen, and sometimes sulfur.
- All amino acids share the same general structure

Amino acid structure

- Amino acids have a central carbon atom. Recall that carbon can form four covalent bond.
- One of those bonds is with **hydrogen**. The other three bonds are with an **amino group (-NH2)**, a **carboxyl group (-COOH)**, and a **variable group (-R)**.
- The variable group makes each amino acid different. There are 20 different variable groups, and proteins are made of different combinations of all 20 different amino acids.
- Several covalent bonds called peptide bonds join amino acids together to form proteins .
- A peptide bond forms between the amino group of one amino acid and the carboxyl group of another.

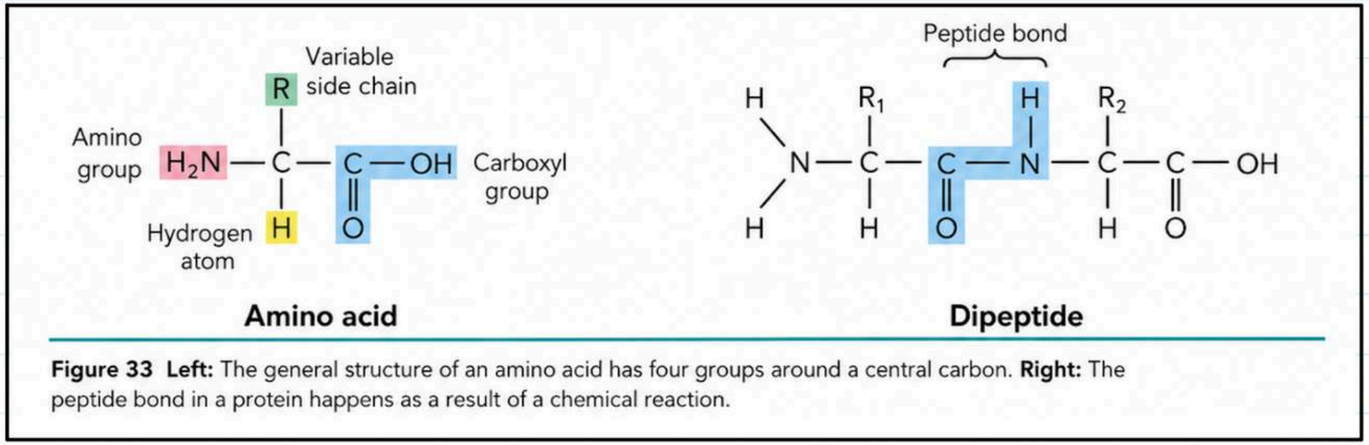


Figure 33 Left: The general structure of an amino acid has four groups around a central carbon. **Right:** The peptide bond in a protein happens as a result of a chemical reaction.

عندما يرتبطان، (H_2N — C — COOH) يحدث تفاعل كيميائي:

- من الـ **Carboxyl group** نأخذ **OH**
- من الـ **Amino group** نأخذ **H**
- **OH + H → H_2O** 💧
- **Carboxyl (C)+ Amino(N) → Peptide bond (C—N)**

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Protein function

- Proteins make up about 15 percent of your total body mass and are involved in nearly every function of your body.
- For example, your muscles, skin, and hair are made of proteins.
- Your cells contain about 10,000 different proteins that provide structural support.
- transport substances inside the cell and between cells, communicate signals within a cell and between cells, speed up chemical reactions, and control cell growth.

Q12	BIO.3.1.02.024: Explain that the hydrocarbon backbones of the sugars formed during photosynthesis are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules used, for example, to form new cells.	Get It	29

1

Which of the following joins amino acids together?

A.	Metallic bond.	**B.**	Peptide bond.	**C.**	Van der Waals forces.	**D.**	Ionic bond.

2

Which of the following compounds can be classified as a proteins?

A.	Polysaccharides	**B.**	Fatty acids	**C.**	Enzymes	**D.**	Nucleic acids

3

Which four groups are bonded to the central carbon atom of an amino acid?

A.	Hydrogen, amino group, carboxyl group, and variable group	**B.**	Two amino groups and two carboxyl groups	**C.**	Phosphate group, sugar, amino group, and hydrogen	**D.**	Glucose, phosphate, hydrogen, and sulfur

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Q13	BIO.3.1.02.024: Explain that the hydrocarbon backbones of the sugars formed during photosynthesis are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules used, for example, to form new cells.	Figure 35	31

Nucleic acids

- Nucleic acids are complex macromolecules that store and transmit genetic information
- There are two types of nucleic acids found in living organisms: **deoxyribonucleic acid (DNA) and ribonucleic acid (RNA)**
- Nucleic acids are made of smaller repeating subunits composed of carbon, nitrogen, oxygen, phosphorus, and hydrogen atoms, called nucleotides
- Adenosine triphosphate (ATP) is a nucleotide with three phosphate groups
- ATP is a storehouse of chemical energy that can be used by cells in a variety of reactions
- It releases energy when the bond between the second and third phosphate group is broken
- Less energy is released when the bond between the first and second phosphate group is broken
- There are five major nucleotides, all of which have three units—a phosphate, a nitrogenous base, and a ribose sugar
- In nucleic acids, the sugar of one nucleotide bonds to the phosphate of another
- The nitrogenous base that sticks out from the chain is available for hydrogen bonding with other bases in other nucleic acids

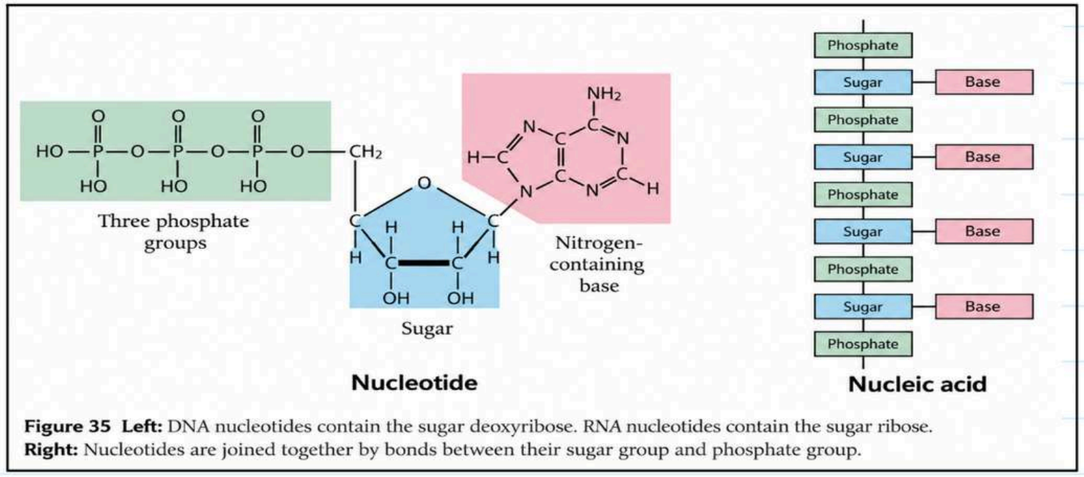


Figure 35 Left: DNA nucleotides contain the sugar deoxyribose. RNA nucleotides contain the sugar ribose. **Right:** Nucleotides are joined together by bonds between their sugar group and phosphate group.

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Q13	BIO.3.1.02.024: Explain that the hydrocarbon backbones of the sugars formed during photosynthesis are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules used, for example, to form new cells.	Figure 35	31

1

Which substance is not part of a nucleotide?

A.	Phosphate.	**B.**	Base.	**C.**	Water.	**D.**	Sugar.

2

Which class of macromolecules store and communicate genetic information?

A.	Carbohydrates	**B.**	Lipids	**C.**	Proteins	**D.**	Nucleic acids

3

Which statement correctly describes nucleic acids according to the lesson?

A. They are complex macromolecules that store and transmit genetic information.	**B.** They are lipids that store energy in fat cells.	**C.** They are carbohydrates that provide structural support in plant cell walls	**D.** They are proteins that speed up chemical reactions.

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Q14	BIO.3.1.01.076: Assess the role of selected technologies in enhancing our understanding of cells and cellular processes.	Figure 1	37

Cell: is the basic structural and functional unit of all living organisms.



Figure 1 Robert Hooke used a basic light microscope to see what looked like empty chambers in a cork sample.

History of the Cell Theory

Robert Hooke

- ☐ **In 1665,** an English scientist named **Robert Hooke** made a simple microscope.
- ☐ He looked at a piece of **cork**, the **dead cells of oak bark**.
- ☐ Hooke observed **small, box-shaped structures**.
- ☐ He called them **cellulae**, the Latin word meaning **small rooms.**

Anton van Leeuwenhoek

- ☐ During the **late 1600s**, Dutch scientist **Anton van Leeuwenhoek** designed his own microscope
- ☐ He saw **living organisms** in:
  - **pond water**
  - **various other substances**
  - **milk**

Development of scientific knowledge

- ☐ **Continuous investigations** by these scientists and many others, along with the **development of new technologies**, led to new scientific information.
- ☐ **Research on cells and cell processes is ongoing.**
- ☐ This led to the development of **new branches of science** and many new discoveries

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1

Which defines a cell?

A.	B.	C.	D.
the basic unit of living things	microscopic organisms in water	the smallest type of animal	protein molecules in animals

2

What did Robert Hooke observe when he looked at cork?

A.	B.	C.	D.
Living bacteria	Small, box-shaped structures	Animal tissues	Individual atoms

3

Which scientist first observed living organisms in pond water?

A.	B.	C.	D.
Matthias Schleiden	Rudolph Virchow	Anton van Leeuwenhoek	Theodor Schwann

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Q15	BIO.3.1.01.075: Identify that all living things are composed of cells.	Information from text Get It	39

The cell theory

- ☐ Scientists continued observing the living microscopic world using glass lenses
- ☐ In ,1838 German scientist **Matthias Schleiden** carefully studied **plant tissues** and concluded that all plants are composed of cells
- ☐ A year later, another German scientist, **Theodor Schwann,** reported that **animal tissues** also consisted of individual cells
- ☐ Prussian physician **Rudolph Virchow** proposed in 1855 that all cells are produced from the **division of existing cells**

Scientist	Year	What did he do?
Robert Hooke	**1665**	Made a **simple microscope** and looked at a piece of **cork**. He observed **small, box-shaped structures** and called them **cellulae**, meaning **small rooms**.
Anton van Leeuwenhoek	**Late 1600s**	Designed **his own microscope** and saw **living organisms** in **pond water, milk, and various other substances.**
Matthias Schleiden	**1838**	Studied **plant tissues** and concluded that **all plants are composed of cells**.
Theodor Schwann	**1839**	Reported that **animal tissues also consisted of individual cells**.
Rudolph Virchow	**1855**	Proposed that **all cells are produced from the division of existing cells**.

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The **cell theory** is one of the fundamental ideas of modern biology and includes the following three principles:

1. **All living organisms are composed of one or more cells.**
2. **Cells are the basic unit of structure and organization of all living organisms.**
3. **Cells arise only from previously existing cells, with cells passing copies of their genetic material on to their daughter cell.**

Microscope Technology

The discovery of cells and the development of the cell theory would not have been possible without microscopes.

Developments in microscope technology have given scientists the ability to study cells in greater detail than early scientists ever thought possible.

Optical microscopes

- ☐ **An optical microscope** uses **visible light and lenses** to magnify an object
- ☐ **A compound light microscope** is a type of optical microscope.
- ☐ Each lens magnifies the image produced by the previous lens.
- ☐ **For Example : magnification of the first lens ×magnification of the second lens = Total magnification**
- ☐ Example: **10 × 10 = 100**
- ☐ Scientists often **stain cells** because cells are **tiny, thin, and translucent**.
- ☐ Scientists have developed techniques for light microscopes, but the properties of visible light will always limit their resolution.
- ☐ **Resolution:** is the ability of a microscope to make individual components visible.
- ☐ Objects cause **light to scatter**, which can **blur images**.
- ☐ The maximum magnification **without blurring is around 1000×.**

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1

Which statement would not be included in a summary of the cell theory?

A. The cell is the basic unit of organization.	**B.** All cells contain a nucleus that controls cell division.	**C.** All organisms are made up of at least one cell.	**D.** All cells come from other, preexisting cells.

2

If a microscope has a series of three lenses that magnify individually 5x, 5x, and 7x, what is the total magnification of the microscope?

A. 25x	**B.** 35x.	**C.** 17x.	**D.** 175x.

3

Which of the following statement is a part of cell theory ?

A. The cell is the basic unit of life.	**B.** All cells contain a nucleus that controls cell division.	**C.** All cell contain membrane bound organelles.	**D.** All organisms are made up of more than one cell.

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Q16	BIO.3.1.01.076: Assess the role of selected technologies in enhancing our understanding of cells and cellular processes.	Figure 3	40

Non-optical microscopes

Transmission Electron Microscope (TEM)

- ☐ In the early 1930s, **Ernst Ruska developed the electron microscope**.
- ☐ The electron microscope uses **magnets to aim a beam of electrons** at thin slices of cells.
- ☐ This type of electron microscope is called a transmission electron microscope (TEM)
- ☐ **Transmission electron microscope (TEM):** electrons are transmitted through a specimen to a fluorescent screen.
- ☐ **Thick parts** of the specimen absorb more electrons than thin parts, forming a **black-and-white shaded image**.
- ☐ Transmission electron microscopes have advantages and disadvantages..
- ☐ magnify up to 500,000x, but the specimen must be dead, sliced very thin, and stained with heavy metals.

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Scanning Electron Microscope (SEM)

- Many modifications have been made to the original electron microscopes over the years. For example :-
- **the scanning electron microscope (SEM):** is a modification that directs electrons over the surface of the specimen, producing a three-dimensional image.
- One disadvantage of using a SEM is that only nonliving cells and tissues can be observed.

Scanning Tunneling Microscope (STM)

- Another type of microscope, the scanning tunneling electron microscope (STM).
- **STM** involves bringing the **charged tip of a probe extremely close to the specimen**.
- Electrons **"tunnel" through the small gap** between the specimen and the tip.
- STM enables scientists to create **three-dimensional computer images** of objects as small as **atoms**.
- In contrast to **TEM and SEM, STM can be used with live specimens**.
- **DNA**, the cell's **genetic material**, can be magnified with STM.

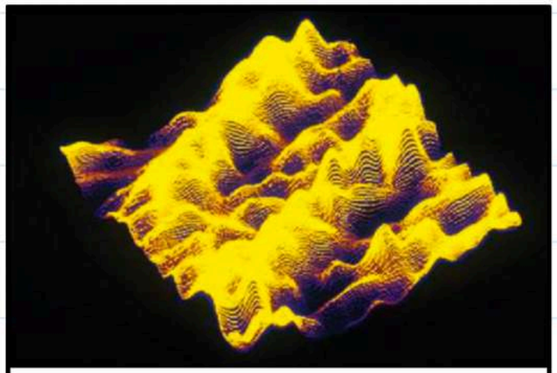


Figure 3 The scanning tunneling microscope (STM) provides images, such as this DNA molecule, in which cracks and depressions appear darker and raised areas appear lighter.

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Q16	BIO.3.1.01.076: Assess the role of selected technologies in enhancing our understanding of cells and cellular processes.	Figure 3	40

1

What type of image does a Scanning Electron Microscope (SEM) produce?

A.	Flat, two-dimensional image	B.	Three-dimensional image of the specimen surface	C.	Black-and-white image of internal details.	D.	Color image of live cells

2

Which statement best compares how TEM and SEM form images?

A.	TEM scans the surface with electrons, while SEM passes electrons through the specimen.	B.	TEM passes electrons through the specimen, while SEM scans the surface with electrons.	C.	Both TEM and SEM pass electrons through the specimen.	D.	Both TEM and SEM can be used on living cells.

3

Which microscope can be used with live specimens and can create three-dimensional computer images of objects as small as atoms?

A.	SEM	B.	TEM.	C.	STM.	D.	Optical microscope

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Q17	Compare the structure and function of plant and animal cells and that of eukaryote and prokaryote cell	Figure 4	41

Basic Cell Types

Plasma membrane: is a boundary that helps control what enters and leaves the cell.

- all cells have at least one physical trait in common: they all have a structure called a plasma membrane.
- Each of your skin cells has a plasma membrane, as do the cells of a rattlesnake

Cells generally have a number of functions in common.

- Most cells have genetic material in some form that provides instructions for making substances that the cell needs.
- Cells also break down molecules to generate energy.

Two basic cell types Scientists group cells into two basic :

- These types are **prokaryotic cells** and **eukaryotic cells**.
- Eukaryotic cells generally are one to one hundred times larger than prokaryotic cells.
- When you compare the prokaryotic and eukaryotic cells you will notice that both have a plasma membran.
- but one cell contains many distinct internal structures called organelles.

Organelles: specialized membrane-bound structures that carry out specific cell functions in different parts of the cell at the same time.

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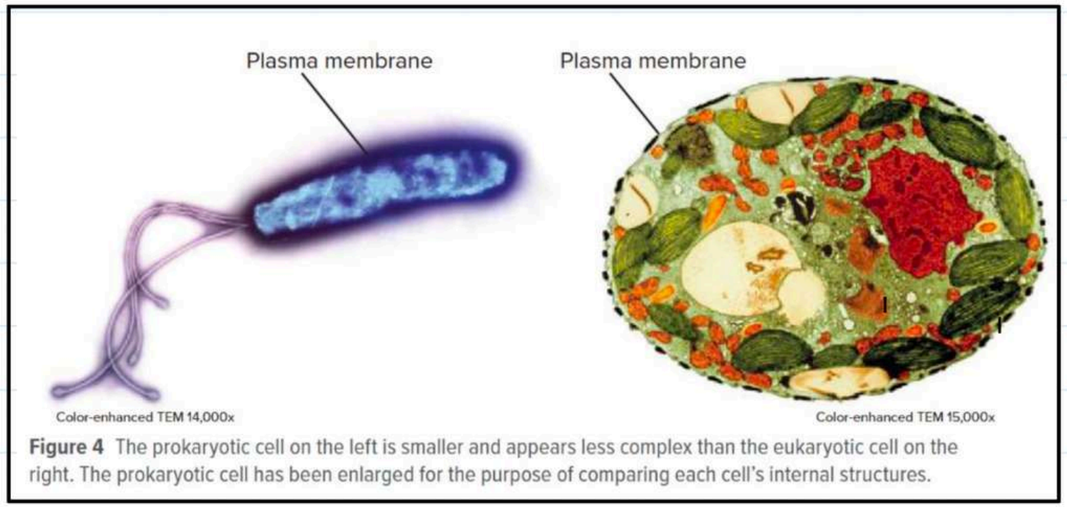


Figure 4 The prokaryotic cell on the left is smaller and appears less complex than the eukaryotic cell on the right. The prokaryotic cell has been enlarged for the purpose of comparing each cell's internal structures.

Eukaryotic cells : are defined as cells with a nucleus and other organelles that are bound by membranes.

The **nucleus:** is a central organelle that contains the cell's genetic material in the form of DNA.

- Multicellular organisms made up of eukaryotic cells are called eukaryotes
- Some unicellular organisms, such as some yeast, also are eukaryotes

- Prokaryotic cells are simpler than eukaryotic cells.

Prokaryotic cells: are defined as cells without a nucleus or other membrane-bound organelles.

- Most unicellular organisms, Such as bacteria, are prokaryotes
- Many scientists think that prokaryotes are similar to the first organisms that lived on Earth

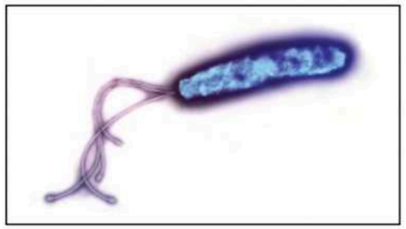
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Q17	Compare the structure and function of plant and animal cells and that of eukaryote and prokaryote cell	Figure 4	41

1

Which kind of cell is shown in the figure below?

A. Animal cell
B. Plant cell
C. Eukaryotic cell
D. Prokaryotic cell



2

Which structure is found in both prokaryotic and eukaryotic cells?

A. Plasma membrane	**B.** Nuclear membrane	**C.** Nucleus	**D.** Membrane-bound organelles

3

What is a major difference between eukaryotic and prokaryotic cells?

A. Eukaryotic cells cannot generate energy	**B.** Prokaryotic cells have DNA, while eukaryotic cells do not.	**C.** .Prokaryotic cells have a plasma membrane, while eukaryotic cells do not.	**D.** .Eukaryotic cells have a nucleus, while prokaryotic cells do not

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Q18	BIO.3.1.01.050 Identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each	Figure 5	43

- Most of the molecules in the plasma membrane are lipid

Lipids: are large molecules that are composed of glycerol and three fatty acids.

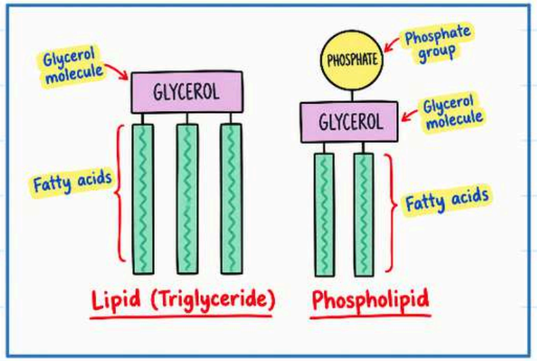
- If a phosphate group replaces a fatty acid, a phospholipid forms.

(Tails) (Head)

▶ **A phospholipid:** is a molecule that has a glycerol backbone, two fatty acid chains, and a phosphate containing group.

The plasma membrane: is composed of a phospholipid bilayer in which two layers of phospholipids are arranged tail-to-tail.

- phospholipids arrange themselves in a way that allows the plasma membrane to exist in the watery environment.



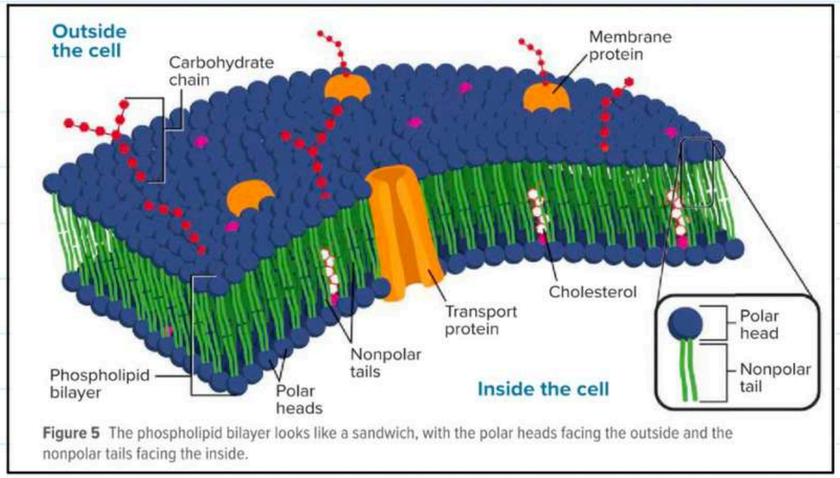
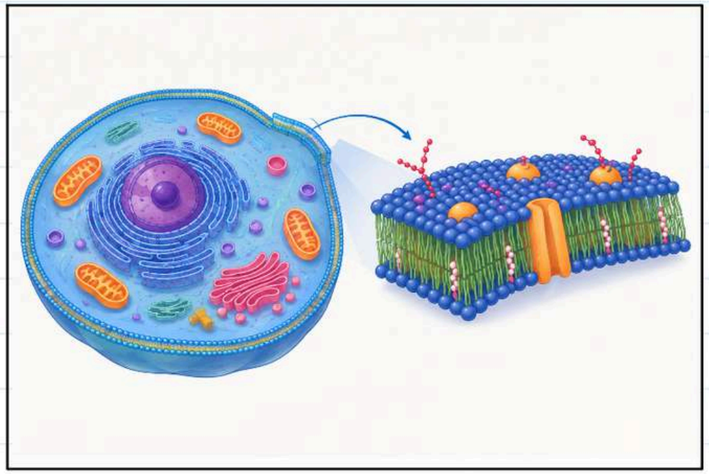


Figure 5 The phospholipid bilayer looks like a sandwich, with the polar heads facing the outside and the nonpolar tails facing the inside.

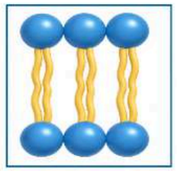
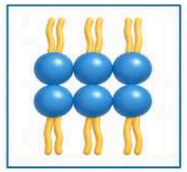
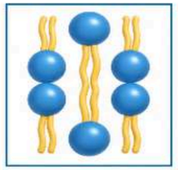
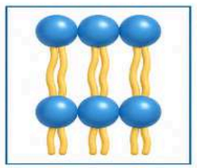


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Q18	BIO.3.1.01.050 Identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each	Figure 5	43

1

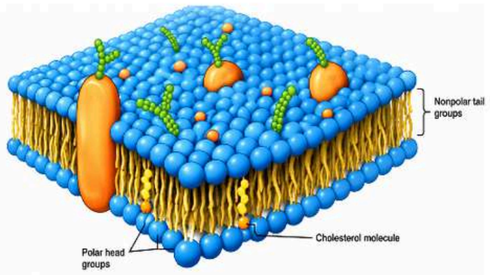
Which one is the best representing of the phospholipid bilayer of the plasma membrane ?

A.	B.	C.	D.
			

2

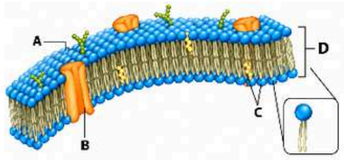
The below picture shows a phospholipid bilayer.
What crucial functions do the nonpolar tails of the phospholipids have.

A. speed chemical reactions with enzymes
B. keep water-soluble substances from passing easily into the cell
C. allow water-soluble substances to pass easily into the cell.
D. help encode genetic material.



3

Which of the following represents the phospholipid bilayer in the plasma membrane.



A.	A	**B.**	B	**C.**	C	**D.**	D

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Q19	BIO.3.1.01.050: Identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each.	Figure 6	45

- ☐ Together, the **phospholipids in the bilayer** create a "sea" in which other **molecules can float.**
- ☐ This "sea" concept is the basis for the **fluid mosaic model** of the plasma membrane.
- ☐ The **phospholipids** can **move** sideways **within** the **membrane**.
- ☐ At the same time, other components in the membrane, such as **proteins**, also **move** among the **phospholipids**.
- ☐ Because there are different substances in the plasma membrane, a pattern, or **mosaic, is created on the surface.**
- ☐ The components of the plasma membrane are in **constant motion**, **sliding past one another.**

- ○ **Fluid:** The components are in **constant motion**,
- ○ **Mosaic:** There are **different substances/components** in the plasma membrane.

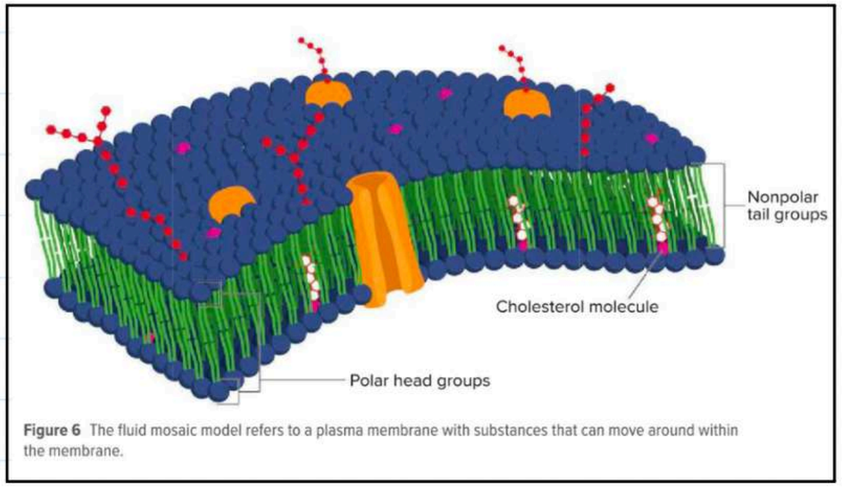


Figure 6 The fluid mosaic model refers to a plasma membrane with substances that can move around within the membrane.

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Function of the Plasma Membrane

- ☐ Recall: that the process of maintaining balance in an organism's internal environment is called **homeostasis**.
- ☐ Homeostasis is essential to the **survival of a cell.**
- ☐ One of the structures that is primarily **responsible for homeostasis** is the **plasma membrane.**
- ☐ The plasma membrane is a **thin, flexible** boundary **between a cell** and its **environment** that **allows nutrients into the cell and allows waste and other products to leave the cell.**
- ☐ All **prokaryotic cells** and **eukaryotic cells** have a plasma membrane **to separate them from the watery environments in which they exist.**

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Q19	BIO.3.1.01.050: Identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each.	Figure 6	45

1

The process of maintaining balance in an organism's internal environment is called….

A. selective permeability	**B.** fluid mosaic	**C.** cell identification	**D.** homeostasis

2

The __ model describes a plasma membrane whose components can move around within the membrane.

A. rigid wall	**B.** fluid mosaic	**C.** Solid layer	**D.** Double nucleus

3

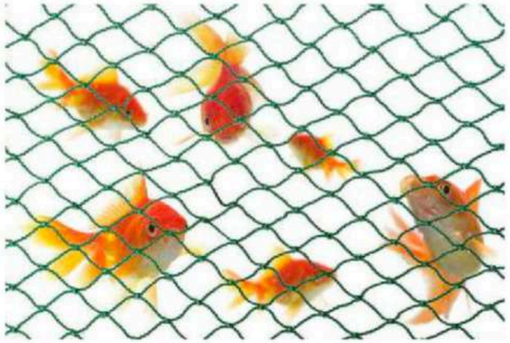
A student observes that phospholipids and proteins can move sideways within the plasma membrane. Which model explains this observation?

A. The rigid wall model	**B.** The fluid mosaic model	**C.** The Solid membrane model	**D.** The phospholipid monolayer model

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Q20	BIO.3.1.01.050 Identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each	Figure 7	46

- ☐ A key property of the plasma membrane is **selective permeability,** by which a membrane allows some substances to pass through while keeping others out.
- ☐ Consider a **fish net** as an analogy of **selective permeability.**
- ☐ The net shown in Figure 7 has holes that allow water and other substances in the water to pass through but not the fish.
- ☐ The **arrows** show that **substances enter** and **leave** the cell through the plasma membrane.
- ☐ **Control of how**, **when**, and **how much of these substances enter and leave a cell relies on the structure of the plasma membrane.**



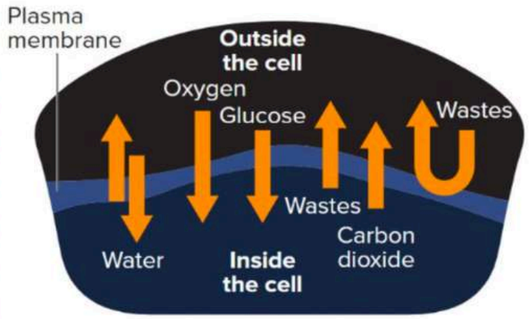


Figure 7 **Left:** The fish net selectively captures fish while allowing water and other debris to pass through.
Right: Similarly, the plasma membrane is selective for substances entering and leaving the cell.

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Q20	BIO.3.1.01.050 Identify structures and organelles in cells, including the nucleus, cell membrane, cell wall, chloroplasts, vacuole, mitochondria, and cytoplasm, and explain the basic functions of each	Figure 7	46

1

In the figure below, the fish net selectively captures fish while allowing water and other debris to pass through. Which of the following works Similarly?



A. The plasma membrane	**B.** The cytoplasm	**C.** The Cytoskeleton	**D.** The nucleolus

2

What is the function of a selectively permeable membrane?

A. provides alternative to phospholipid bilayer.	**B.** prevents transport proteins from harming cell	**C.** controls what enters and leaves cell.	**D.** blocks all water from entering cell

3

A membrane allows some substances to pass through while keeping others out. Which property does this describe?

A. Homeostasis	**B.** Cell identity	**C.** Fluidity	**D.** Selective permeability

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