حقيبة تعليمية

بعنوان: الاحياء البشري

إعداد
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م.م ايات عبدالجليل

٢٠٢٢ ـ ٢٠٢٣

المقدمة

يعد علم الأحياء البشري واحداً من بين العلوم التي قد تقوم بدراسة الإنسان والخلايا الموجودة في جسم الإنسان، فالإنسان لا يتكون من هيكل خارجي. بل يحتوي على العديد من الخلايا المختلفة والعديد من الأجهزة التي هي السبب في وجوده بالحياة، والتي لا يمكننا أن نقوم بإنكار أهمية كل خلية من هذه الخلايا، التي قد قام علم الأحياء البشري بدراستها والتعرف عليها. حيث يقوم علم الأحياء بدراسة الأجهزة الوظيفية لجسم الإنسان، والتي هي السبب في وجوده على قيد الحياة، مثل الجهاز العصبي، وكذلك جهاز المناعة، والجهاز الهضمي. كما أننا لا يمكن أن ننكر أن هذا العلم أو هذا الفرع من فروع علم الأحياء ليست على علاقة قوية جداً ووثيقة مع العلوم الأخرى. بل أنها كانت من الممكن ألا تظهر بهذا الشكل لولا الارتباط الوثيق الذي بينها، وبين العلوم الأخرى والتي من بينها علم الأحياء الخلوي وعلم الدم وعلم الأحياء الدقيقة. فجسم الإنسان يتكون من مجموعة من الخلايا تقوم على عدة مستويات مختلفة، وهي مستوى الخلايا وتبادلها، والمستوى الآخر يتمثل في مستوى النسيج الخلوي. أما من جهة المستوى العضوي فيقوم هنا على دراسة التبادلات بين الأنسجة وبعضها البعض، ومن جهة الأجهزة الموجودة داخل جسم الإنسان فهي عدد مختلف من الأجهزة، التي قد يتم من خلاله دراسة العلاقات بين الأعضاء والأجهزة.

دراسة جسم الإنسان و أجهزته تجري على عدة مستويات :

١- على مستوى الخلايا وتبادلاتها
٢- على مستوى النسيج الحيوي
٣- على المستوى العضوي : ودراسة التبادلات بين الأنسجة ..
٤- على مستوى الأجهزة : حيث تدرس العلاقات بين الأعضاء و الأجهزة

فهرس المحتويات

وصف المقرر الدراسي

TEMPLATE FOR COURSE SPECIFICATION

Professor of the subject / Prof. Dr. Hussein Ahmed -M.Sc. Ayat Abduljaleel

This course description provides a brief summary of the most important characteristics of the course and the learning outcomes expected of the student to achieve, demonstrating whether he has made maximum use of the opportunities learning available. It must be linked to the description of the program.;

1. Educational institution	Al-Rasheed University College
2. Section scientific / Center	Medical laboratory techniques
3. Course name / code	Human Biology / HuBi130
4. Programme (s) to which it contributes	Medical laboratory technique

5. Available attendance shapes	Electronic platform / Practical presence
6. season/year	First and second semester 2022/2023
7. The number of school hours (total)	60 hours
8. The date this description was prepared	2022
9. Course objectives	
Provide the student with the types of biological knowledge and knowledge of the characteristics of the work of the body of the living organism	

10. Output Established Teaching, learning and assessment methods
A- Knowledge and Understanding A1-Providing the student with knowledge related to understanding the structure and functions of the human body. A2- Knowledge of human anatomy and physiology. A3- Recognize the structure of the cell, organelles, and cellular processes. A4- Identifying the types of viruses, fungi and bacteria and the diseases they cause to the human body. A5- Analysis and interpretation of scientific information. A6- Better understanding of human health, how to maintain our health, and how diseases and injuries can be treated. A7- Knowing how cell division and the transfer of genetic material. A8- Knowledge of how to divide and classify living things and what are the most important kingdoms in life.
B - Subject-specific skills B 1 -Providing the student with practical and theoretical experiences related to biology in general and the human body.
Teaching and learning methods
1-Through video lectures via the electronic platform. 2- PowerPoint. 3- Paper lecture.
Assessment methods
1- Through various exams (daily, middle and end of semester). 2- Reports. 3- Discussions.
C- Thinking Skills
1- Teaching students the skills of using biological tools and laboratory equipment. 2-Through video lectures, discussions and daily, monthly and quarterly exams.

Teaching and learning methods
1- Through various exams. 2- Presentation.
Assessment methods 1- Midterm exam. 2- Sudden short quizzes. 3- Evaluation Customer reports. 4- Final exam.

11.Course structure					
the week	hours	Required learning outcomes	Unit name and/or topic	Education method	Evaluation method
1	2	Define biology and its branches. List and explain the levels of ecological organization	The Science of Biology Why study biology is importance, Diffinition of biology, Some subdivision of biology	Data show, whiteboard.	Miscellaneous exams
2	2	Define the following (Reproduction, Evolution, Adaptation and Metabolism). List types of reproduction and give an example	The Characteristics of Living Things (Organisms) Evaluation, Adaptation, Respiration, Homeostasis, Metabolism, Anabolism, Catabolism, Respond to stimuli, Reproduction	Data show, whiteboard.	presentation
3	2	Provide the student with knowledge about the divisions of living organisms	The Kingdom of Living Things Classification of Organisms, Categories of Classification of Organisms, The five Kingdoms Scheme of Classification	Data show, whiteboard.	Various exams and reports
4	2	Describe and define the biomolecules. List types of biomolecules.	Chemistry of Life (Biology of Polymerase, Levels of Organization Lipids, Carbohydrates, Proteins, Amino acid	Data show, whiteboard.	seminar

5	2	Explain the animal cell. Explain the plant cell. Compare between plant and animal cells.	Cell Structure and Function, Animal cells Cell Wall, Cell Membrane, Cytoplasmic Matrix, Nucleolus	Data show, whiteboard.	Miscell aneous exams
6	2	Describe the functions of all cell organelles	Endoplasmic Reticulum, Golgi apparatus, Cilia, Flagella Plant cells Comparison Between Animal and Plant, etc.	Data show, whiteboard.	present ation
7	2	Define cell and list its types. Compare between prokaryotes and eukaryotes cells and know the differences between them.	Prokaryotes Cells, Eukaryotes Cells, Differences, Characteristics and Comparison	Data show, whiteboard.	Various exams and reports
8	2	Define cell cycle and explain its phases.	Cell Life Cycle (Mitosis), Nuclear Division, Cytoplasmic Division)	Data show, whiteboard.	seminar
9	2	List meiosis phases and explain their events	Meiosis (Human Reproduction), Spermatogenesis, Oogenesis	Data show, whiteboard.	Miscell aneous exams
10	2	Types of Nucleic Acids The structure of nucleotides	Gene and Gene Action, DNA, RNA Structures.	Data show, whiteboard.	present ation

11		Define genetic code and codon	Genetic Codes, Replication, Translation, Transcription, Mutation	Data show, whiteboard.	Various exams and reports
12	2	List the organ systems of the body. Describe each system and write its functions	Organ Systems (Digestive, Circulatory, Respiratory, Urinary, Muscularly, Nervous)Systems	Data show, whiteboard.	seminar
13	2	Define virus. Define bacteriophages	Viruses, Viroid, Prions, Bacteriophages, Viral Life Cycle, Characteristics, Shapes.	Data show, whiteboard.	Miscellaneous exams
14	2	Harmful of viruses.	Viral Human Diseases, Harmful of Viruses	Data show, whiteboard.	Miscellaneous exams
15	2	Discus kingdom Monera. Define the following terms (flagella, fimbriae and plasmids).	Kingdom OF Monera: Phylum Schizophyta (Bacteria)، Classification Structure, Morphology., Growth and Function, Motility	Data show, whiteboard.	presentation
16	2	Bacterial Diseases in Human	Harmful Activity of Bacteria (Bacterial Diseases in Human and Animals, Control of bacteria.	Data show, whiteboard.	Various exams and reports
17	2	Classify kingdom Protista. Classify algae.	Kingdom OF Protista, Simple Algae., Harmful of Algae	Data show, whiteboard.	seminar

18	2	Explain the following terms (Ciliates, Zooflagellates, Amoeboids and Sporozoa).	Kingdom of Protista, Protozoans, Classification of Protozoa	Data show, whiteboard.	Miscellaneous exams
19	2	Explain the following terms (Ciliates, Zooflagellates, Amoeboids and Sporozoa).	Phylum of Sarcodina ,Amoebas‘‘ Phylum of Zoomastigina, Trypanosoma, Giardia	Data show, whiteboard.	presentation
20	2	Explain plasmodium	Phylum of Sporozoa, Plasmodium	Data show, whiteboard.	Various exams and reports
21	2	Classify kingdom of fungi and their importance.	Kingdom of Fungi, Classification, Reproduction	Data show, whiteboard.	seminar
22	2	The Dangers of fungi.	Harmful Activities of Fungi	Data show, whiteboard.	Miscellaneous exams
23	2	Define Lichens. Explain fungal relationships.	Yeast and Yeast Like Fungi, Characteristic and Classification, Candida.	Data show, whiteboard.	presentation
24	2	Explain the differences between invertebrates and vertebrates	Kingdom of Animals, Classification, Invertebrates and Vertebrates , Importance to Human Diseases	Data show, whiteboard.	Various exams and reports
25	2	Enumerate the types of muscles and their properties and functions	Human Bodies, Protection, Support and Loculation,	Data show, whiteboard.	seminar

26	2	Define the following terms: (immunity, antibodies and hormones).	Human Body Defense (Immunity, Antigen, Antibody) , Hormones, Enzymes	Data show, whiteboard.	Miscellaneous exams
27	2	Classify helminths	Helminths, Characteristics and Classification.	Data show, whiteboard.	Miscellaneous exams
28	2	Describe the flat worms and mention its types. Describe the round worms.	Flat Worms, Round Worms, Classification ، Harm full Activities to Human.	Data show, whiteboard.	presentation
29	2	Explain the relationship between organism in ecosystem.	Ecosystem and Relationships between Organisms	Data show, whiteboard.	Various exams and reports
30	2	Explain the scientific methods.	Scientific Methods, Steps and Examples of Scientific Methods	Data show, whiteboard.	seminar

12. Infrastructure	
2 main references (sources)	1-Glenco-Biology-Dynamic of Life (Megraw 2008). 2-Mader-Biology-Injury into Life (Nine Edition). 3-Prescott, Harley and Klein -Biology- (Sixth Edition)
Recommended books and references (Scientific journals, reports, ...)	A collection of books on general biology and human biology
B electronic references, websites...	A collection of books on general biology and human biology
Community-based facilities (include for example, guest Lectures, internship , field studies)	Lectures and field studies
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13. Admissions	
Pre-requisites	
Minimum number of students	15 students
Maximum number of students	20 students

إرشادات للطلبة

- الرغبة والحماس للتعليم
- كن مشاركاً في جميع الأنشطة
- احترم أفكار المدرس والزملاء
- أنقد أفكار المدرس والزملاء بأدب إن كانت هناك حاجة.
- احرص على استثمار الوقت
- تقبل الدور الذي يسند إليك في المجموعة
- حفز أفراد مجموعتك في المشاركة في النشاطات
- احرص على بناء علاقات طيبة مع المدرس والزملاء أثناء المحاضرة
- احرص على ما تعلمته في المحاضرة وطبقه في الميدان .
- ركز ذهنك بالتعليم واحرص على التطبيق المباشر
- تغلق الموبايل قبل الشروع بالمحاضرة

الوحدة الأولى - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define biology and its branches.
2- List and explain the levels of ecological organization.
3- Explain the characteristics of life.
4- Define the following terms (anatomy, parasitology, microbiology, physiology, immunology).

موضوعات المحاضرة الاولى:

1- The Science of Biology.
2- Why study biology?
3- Its importance.
4- Definition of biology.
5- Some subdivision of biology.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط التعارف (١/١/١) • محاضرة • مناقشة • سؤال وجواب	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الأولى	الأولى	الترحيب بالطلبة والتعارف معهم	٩٠ دقيقة
		التعريف بالبرنامج وأهدافه وأهميته	
		القاء المحاضرة مستخدما جهاز العرض والسبورة	
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/١/١) تمرين متعدد الخيارات	

المادة العلمية:

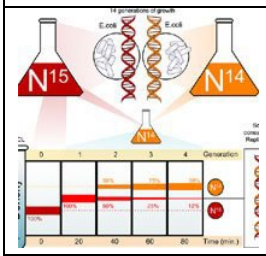
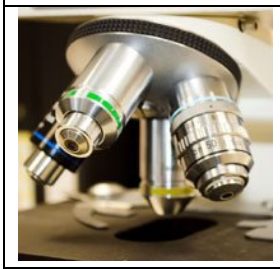
Biology: is the study of life. It's derived from the Greek word bios, meaning "life," and logos, meaning "study".

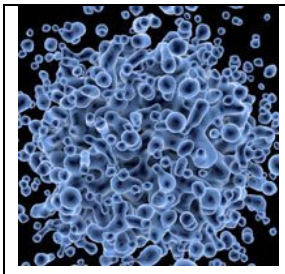
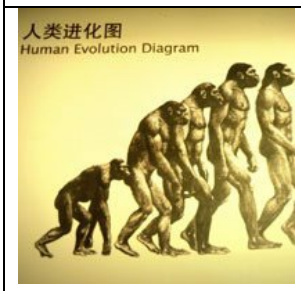
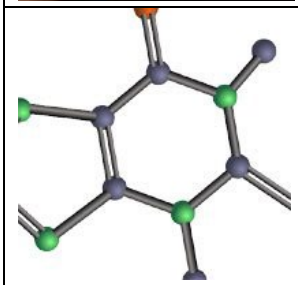
Biology: is the science that studies living organisms and how they interact with one another and their environment.

Biologists study the distribution, evolution, function, growth, origin, structure, and taxonomy of species. We're able to understand how our bodies work, how organisms work, how our cells work. It's the science that tells us everything about *what* we are.

Branches of Biology

Biology is subdivided into separate branches for convenience of study, though all the subdivisions are interrelated by basic principles.

	**Anatomy**: is the branch of biology that deals with the study of the structure of organisms and their parts.
	**Biochemistry**: is the branch of biology concerned with the chemical and physiochemical processes that occur within living organisms.
	**Biotechnology** Biotechnology is the exploitation of biological processes such as genetic manipulation of micro-organisms for the production of antibiotics, hormones, etc.
	**Parasitology**: is the branch of biology or medicine concerned with the study of parasitic organisms.

	**Genetics**: is the study of genes, genetic variation, and heredity in living organisms.
	**Evolution** Evolution is the process by which different kinds of living organisms are thought to have developed and diversified from earlier forms during the **history** of the earth (Darwinism).
	**Immunology**: is the branch of medicine and biology concerned with immunity.
	**Molecular Biology**: is the branch of biology that deals with the structure and function of the proteins and nucleic acids.

Levels of Ecological Organization

Ecosystems can be studied at small levels or at large levels. The levels of organization are described below from the smallest to the largest:

- **Individuals:** One or more cells characterized by a unique arrangement of DNA "information". These can be unicellular or multicellular. The multicellular individual exhibits specialization of cell types and division of labor into tissues, organs, and organ systems.

- **A species:** is a group of individuals that are genetically related and can breed to produce fertile young. Individuals are not members of the same species if their members cannot produce offspring that can also have children.
- **A population:** is a group of organisms belonging to the same species that live in the same area and interact with one another.
- **A community:** is all of the populations of different species that live in the same area and interact with one another. A community is composed of all of the biotic factors of an area.
- **An ecosystem:** includes the living organisms (all the populations) in an area and the non-living aspects of the environment. An ecosystem is made of the biotic and abiotic factors in an area.
- **The biosphere:** is the part of the planet with living organisms (The biosphere includes most of Earth, including part of the oceans and the atmosphere.

Q1: Define Biology
Q2: Enumerates the levels of Ecological Organization

الوحدة الاولى - المحاضرة الثانيه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثانيه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define the following (Reproduction, Evolution, Adaptation and Metabolism).
2- List types of reproduction and give an example.
3- Explain the differences between adaptation and evolution.

موضوعات المحاضرة الثانيه:

1- The Characteristics of Living Things (Organisms).
2- Evaluation, Adaptation, Respiration, Hemostasis, Reproduction, Metabolism, Anabolism, Catabolism and respond to stimuli.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• مناقشه • محاضرة • نشاط (١/٢/١) تعداد	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثانيه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الأولى	الثانيه	مناقشة موضوع المحاضره مع الطلبه	٩٠ دقيقة
		القاء المحاضرة مستخدما جهاز العرض والسبورة	
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/٢/١) تعداد	

المادة العلمية:

The Characteristics of Life

Biologists have formulated a list of characteristics by which we can recognize living things. Anything that possesses all of the characteristics of life is known as an organism.

To be classified as a living thing, most scientists agree that an object must have all of the following traits:

1- Reproduction: is the process by which new organisms are generated. A living organism does not need reproduction to survive, but as a species, they need that for continuity and to ensure that they are not extinct.

-Sexual Reproduction: this involves two individuals of the same species, usually a male and female.

-Asexual reproduction: This form of reproduction occurs without the involvement of another. There are many forms of asexual reproduction. Mitosis, fission, budding, fragmentation, sporulation and vegetative reproduction.

2- Adaptation: are modifications that make an organism suited to its way of life. Also, it's a characteristic that helps living things survive and reproduce in a given environment. It comes about because living things have the ability to change over time in response to the environment.

Adaptations come about through evolution (A change in the characteristics of living things over time).

3- Metabolism: all living things can use energy. Their cells have the "machinery" of metabolism, which is the building up and breaking down of chemical compounds. Living things can transform energy by converting chemicals and energy into cellular components. This form of metabolism is called anabolism. They can also break down, or decompose, organic matter, which is called catabolism.

4- Growth and Development: All living things have the capacity for growth. Growth is an increase in size that occurs when there is a higher rate of anabolism than catabolism. For example, a human infant has increase in size by the time. First, the fertilized egg develops into a newborn, and then a human goes through the stages of childhood, adolescence, adulthood, and aging. Development also includes the repair that takes place following an injury.

5- Response to Stimuli: All living things detect changes in their environment and respond to them. A response can take many forms:

- Movement in humans is dependent upon their nervous and muscular systems.

- The movement of a unicellular organism in response to external chemicals called chemotaxis.

- The leaves of a plant turning toward the sun called phototropism.

6- Homeostatic: Homeostasis means "staying the same." Actually, the internal environment stays relatively constant; for example, the human body temperature fluctuates slightly during the day. All human systems contribute to homeostasis. The digestive system provides nutrient molecules; the circulatory system transports them about the body; and the excretory system rids blood of metabolic wastes. The nervous and hormonal systems coordinate the activities of the other systems.

Q1: Enumerates the six traits of object that should have to classify as organism.

الوحدة الثانيه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define classification and know the meaning of taxonomy and the differences between them.
2- Classify living organisms.
3- Enumerate the five kingdoms.
4- Give an example about classification.
5- How to write the scientific name of organisms.

موضوعات المحاضرة الاولى:

1- The Kingdom of Living Things
2- Classification of organisms
3- Categories of classification of organisms.
4- The five kingdoms scheme of classification.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/١/٢) تعريف وتعداد • محاضرة • مناقشة	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

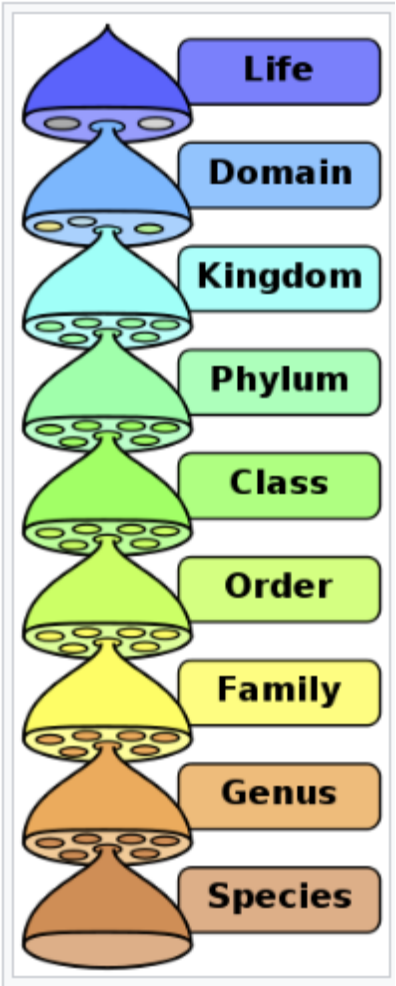
خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الثانيه	الأولى	نشاط (١/١/٢) تعريف وتعداد	٩٠ دقيقة
		السماح للطلبه بقراءة المحاضره وشرح مافهموه عن الموضوع	
		الاجابه على اسئلة الطلبه	

المادة العلمية:

Classification of Organisms

Organizing items can help you understand them better and find them more easily. For example, you probably order your clothes drawers and your CD collection. Biologists want to better understand organisms so they organize them. One tool that they use to do this is **classification** the grouping of objects or information based on similarities. **Taxonomy** is the branch of biology that groups and names organisms based on studies of their different characteristics. Biologists who study taxonomy are called **taxonomists.**



Categories	For Humans	Description
Kingdom	Animalia	Multicellular, moves, ingests food
Phylum	Chordata	Dorsal supporting rod and nerve cord
Class	Mammalia	Hair, mammary glands
Order	Primates	Adapted to climb trees
Family	Hominidae	Large brain, tool use Adapted to walk erect
Genus	Homo	
Species	H. sapiens	

- Domain: المجال او النظام - Archea, Eubacteria, Eukaryote
- Kingdom: مملكة Plants, Animals, Fungi, Protists, Eubacteria (Monera)
- Phylum: شعبة
- Class: صف
- Order: رتبة
- Family: عائلة
- Genus: جنس
- Species نوع

Five kingdom classification was proposed to distinguish between prokaryotes and eukaryotes.

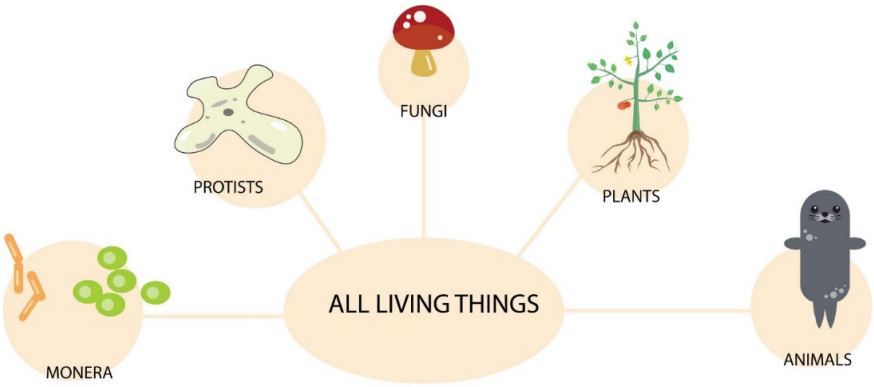
a) Kingdom Monera

b) Kingdom Fungi

c)Kingdom Protista

d)Kingdom Plantae

e) Kingdom Animalia



Five Kingdom system classification

Q1: Define the following:

1- **Classification.**
2- **Taxonomy.**

Q2: Enumerate the five kingdoms of life.

الوحدة الثالثه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1. Describe and define the biomolecules.
2. List types of biomolecules.
3. Define and explain the importance of the following terms (Lipids, carbohydrates, proteins and amino acid).
4. Classify vitamins according its solubility in fat or in water.

موضوعات المحاضرة الاولى:

1. Chemistry of Life
2. Biology of Polymerase.
3. Lipids.
4. Carbohydrates.
5. Proteins.
6. Amino acid.
7. Vitamins.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• فديو • مناقشة • نشاط (١/١/٣) مقارنه	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الثالثه	الأولى	عرض فديو توضيحي عن المحاضره	٩٠ دقيقة
		طرح بعض الاسئلة خلال عرض الفديو	
		نشاط (١/١/٣) مقارنه	

المادة العلمية:

Biomolecules

Living systems are made up of various complex biomolecules like carbohydrates, proteins, nucleic acids, lipids, etc. Proteins and carbohydrates are essential constituents of our food. These biomolecules interact with each other and constitute the molecular logic of life processes. In addition, some simple molecules like vitamins and mineral salts also play an important role in the functions of organisms.

1- A carbohydrate: are primarily produced by plants and form a very large group of naturally occurring organic compounds. Some common examples of carbohydrates are cane sugar, glucose, starch, etc. It is a biomolecule composed of carbon, hydrogen, and oxygen with a ratio of about two hydrogen atoms (H-C-OH).

- Monosaccharide: also called simple Carbohydrates, if the number of carbon atoms in a molecule is low (from three to seven), then the carbohydrate is a simple sugar, or monosaccharide. Common examples are the glucose and fructose.

- Disaccharide: contains two monosaccharides. When glucose and fructose join, the disaccharide sucrose forms.

- Polysaccharides: the largest carbohydrate molecules are polysaccharides, polymers composed of many monosaccharide subunits. The starch, glycogen, and cellulose are examples of polysaccharides.

Importance of Carbohydrates

Carbohydrates are essential for life in both plants and animals.

1- They form a major portion of our food. Honey has been used for a long time as an instant source of energy.
2- Carbohydrates are used as storage molecules as starch in plants and glycogen in animals.
3- Cell wall of bacteria and plants is made up of cellulose.

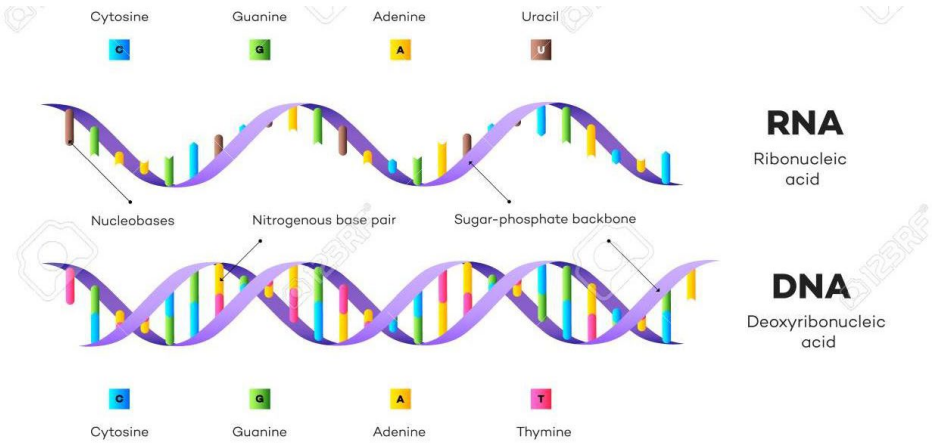
2- Lipids: are large biomolecules that are made mostly of carbon and hydrogen with a small amount of oxygen. Fats, oils, waxes, and steroids are all lipids. They are insoluble in water because their molecules are nonpolar and are not attracted by water molecules. Lipids are very important for the proper functioning of organisms. Cells use lipids for energy storage, insulation, and protective coverings.

3- Proteins: Proteins are the most abundant biomolecules of the living system. Chief sources of proteins are milk, cheese, pulses, peanuts, fish, meat, etc. A protein is a large, complex polymer composed of carbon, hydrogen, oxygen, nitrogen, and sometimes sulfur. The basic building blocks of proteins are called amino acids. Enzymes are important proteins found in living things.

An enzyme is a protein that changes the rate of a chemical reaction. In some cases, enzymes increase the speed of reactions that would otherwise occur slowly.

4-Nucleic acids: are another important type of organic compound that is necessary for life. A nucleic acid is a complex biomolecule that stores cellular information in the form of a code. Nucleic acids are polymers made of smaller subunits called nucleotides. Nucleotides consist of carbon, hydrogen, oxygen, nitrogen, and phosphorus atoms. Nucleic acids, such as DNA (deoxyribonucleic acid) and RNA (ribonucleic acid). 3 The nucleotides in DNA contain the sugar deoxyribose, and in RNA they contain the sugar ribose.

There are four different types of bases in DNA: A _adenine, T _ thymine, G _ guanine, and C _ cytosine. In RNA the base uracil replaces the base thymine.



5-Vitamins: It has been observed that certain organic compounds are required in small amounts in our diet but their deficiency causes specific diseases. Most of the vitamins cannot be synthesized in our body but plants can synthesize almost all of them, so they are considered as essential food factors. However, the bacteria of the gut can produce some of the vitamins required by us. Vitamins are designated by alphabets A, B, C, D, etc. Some of them are further named as sub-groups e.g. B1, B2 , B6 , B12.

Classifications of Vitamins:

Vitamins are classified into two groups depending upon their solubility in water or fat.

(i) **Fat soluble vitamins:** Vitamins which are soluble in fat and oils but insoluble in water are kept in this group. These are vitamins A, D, E and K. They are stored in liver and adipose (fat storing) tissues.

(ii) **Water soluble vitamins:** B group vitamins and vitamin C are soluble in water so they are grouped together. Water soluble vitamins must be supplied regularly in diet because they are readily excreted in urine and cannot be stored in our body.

Q1: Compare between monosaccharide and disaccharide.

الوحدة الرابعه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Explain the animal cell.
2- Explain the plant cell.
3- Compare between plant and animal cells.

موضوعات المحاضرة الاولى:

1. Animal cell.
2. Plant cell.
3. Comparison between animal and plant cells.

الأساليب والأنشطة والوسائل التعليمية

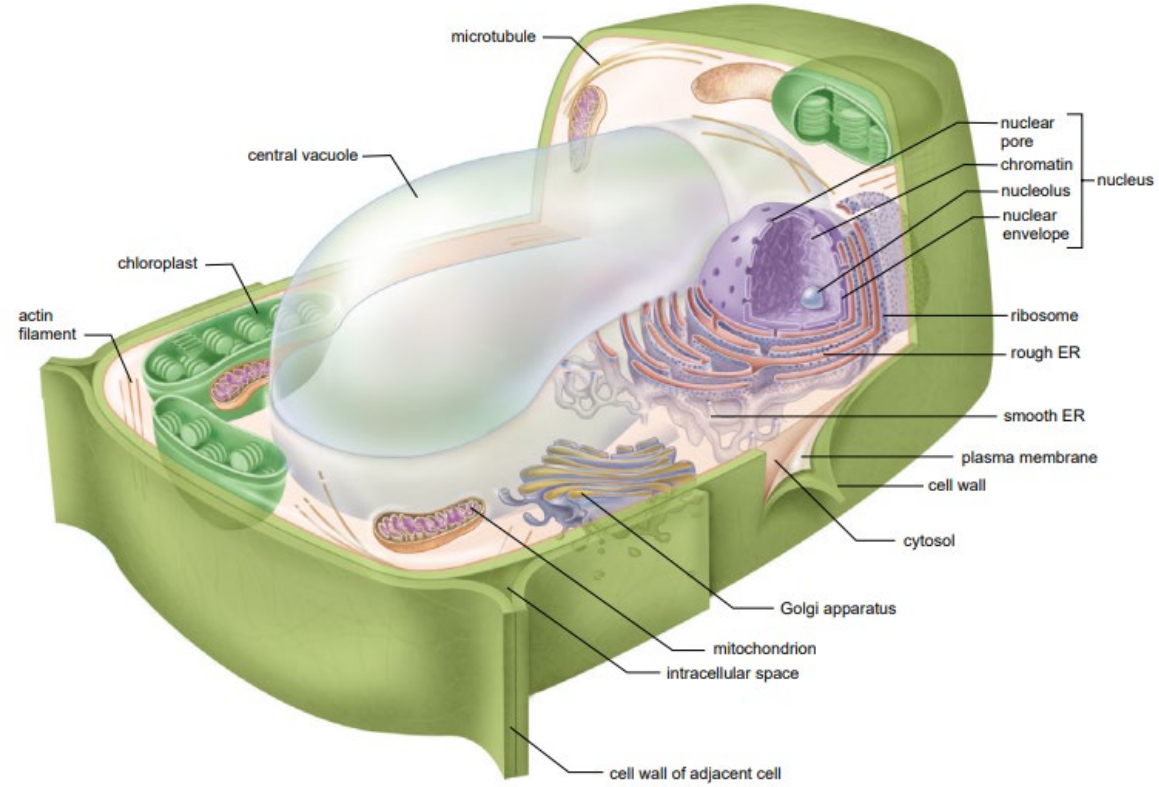
م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• عرض تقديمي • محاضره • سؤال وجواب • نشاط (١/١/٤) مقارنه	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

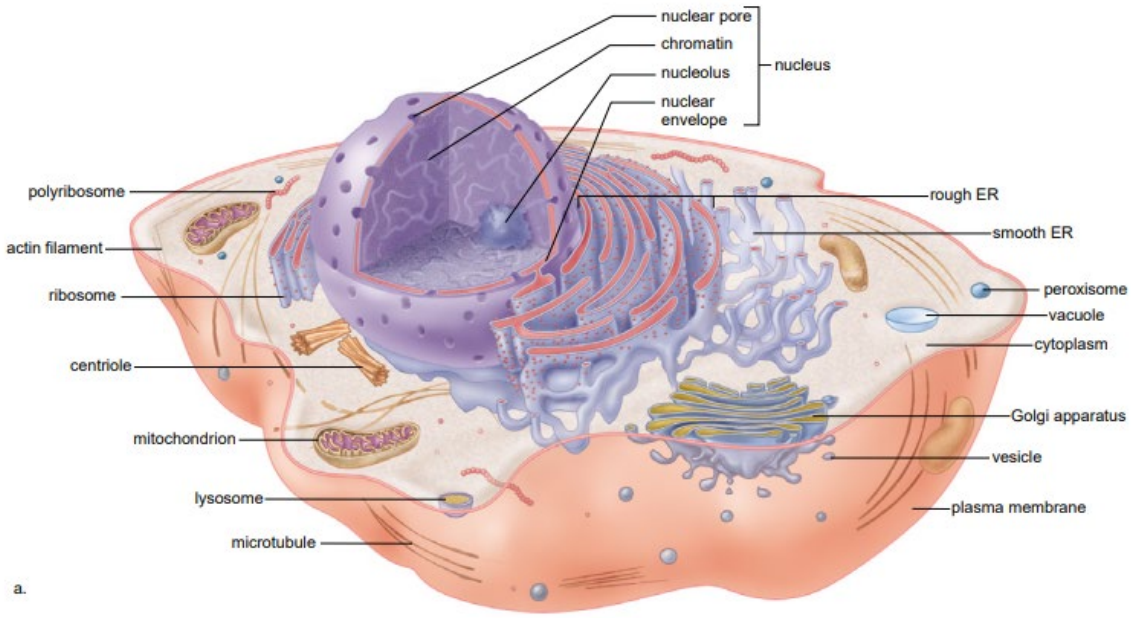
خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الرابعه	الأولى	عرض تقديمي باستخدام جهاز العرض	٩٠ دقيقة
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/١/٤) مقارنه	

المادة العلمية:

Animal and Plant cells





Organelles of Animal and Plant Cells

1- The Nucleus

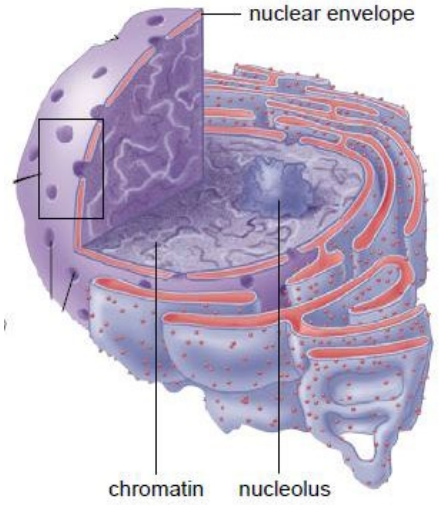
The nucleus, which has a diameter of about 5 µm, is a prominent structure in the eukaryotic cell. The nucleus is of primary importance (function) because it stores genetic information that determines the characteristics of the body's cells and their metabolic function.

The structural features of the nucleus include the following:

• Chromatin: DNA and proteins.

• Nucleolus: chromatin and ribosomal subunits. In the nucleolus, rRNA is synthesized and assembled with proteins from the cytoplasm to form ribosomal subunits. The subunits pass from the nuclear pores to the cytoplasm where they combine to form ribosomes.

• Nuclear envelope: double membrane with pores.



2- Ribosomes

Ribosomes are small organelles where protein synthesis occurs. Ribosomes occur in the cytoplasm, both singly and in groups (i.e., polyribosomes). Numerous ribosomes are attached to the endoplasmic reticulum.

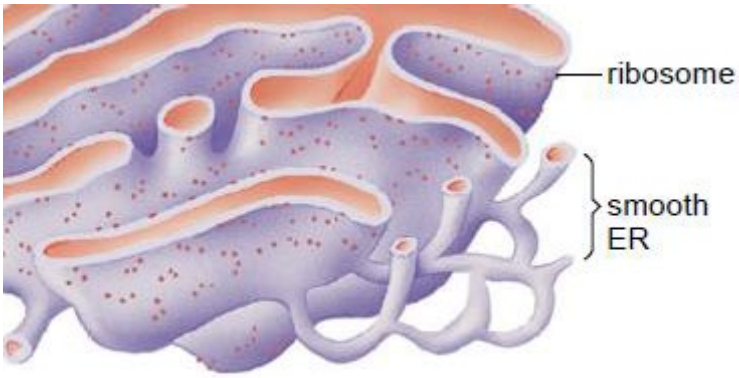
2- The Endoplasmic Reticulum

The endoplasmic reticulum (ER), consists of a network of membranous tubules and sacs called cisternae. ER is physically continuous with the outer membrane of the nuclear envelope. There are two types:

3- Rough ER have ribosome attached on the membrane and appears to be flattened saccules.

Function:

Synthesis secretory proteins, cell membrane protein and organelle protein.



2- Smooth ER does not have attached ribosomes and appear as network of interconnected tubules.

Functions:

4- synthesis of lipid (oils, phospholipids, and steroids) glycogen metabolism in the liver cells.
5- Detoxification of drugs and poisons.
6- Store calcium for muscle contraction.

7- The Golgi Apparatus

The Golgi apparatus consists of a stack of three to twenty slightly curved saccules. The Golgi apparatus sorts proteins into packages and packs them into membrane-bound structures, called vesicles.

1- The Golgi apparatus contains enzymes that modify proteins and lipids. For example, it can add a chain of sugars to proteins, thereby making them glycoproteins and glycolipids.

2- The vesicles that leave the Golgi apparatus move to different locations in the cell. Some vesicles proceed to the plasma membrane, where they discharge their contents. Because this is **secretion**, it is often said that the Golgi apparatus is involved in processing, packaging, and secretion.

Q1: Compare between smooth and rough endoplasmic reticulum

الوحدة الرابعه - المحاضرة الثانيه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثانيه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Describe the functions of all cell organelles.

موضوعات المحاضرة الثانيه:

1- Cell organelles: (Cell wall, Cell membrane, cytoplasmic matrix, nucleus, endoplasmic reticulum, Golgi apparatus, cilia, flagella).

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/٢/٤) تعريف وتعداد • مناقشه موضوع المحاضره	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثانيه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الرابعه	الثانيه	نشاط (١/٢/٤) تعريف وتعداد القاء المحاضرة	٩٠ دقيقة
		مناقشة موضوع المحاضره مع الطلبه قبل القاء المحاضره	
		القاء المحاضره باستخدام جهاز العرض	

المادة العلمية:

5- Lysosomes

Lysosomes are membrane-bounded vesicles produced by the Golgi apparatus in animal cells and plant cells. Lysosomes contain hydrolytic digestive enzymes. Function: lysosomal enzymes digest macromolecules into simpler subunits and help white blood cells to digest engulfing bacteria.

6- Vacuoles

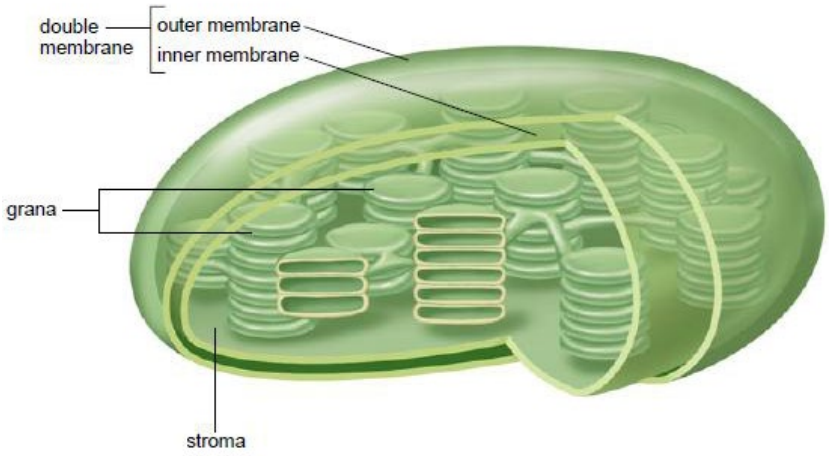
A vacuole is a large membranous sac. Animal cells have vacuoles, but they are much more prominent in plant cells.

Function:

1- The vacuoles present in unicellular protozoans are quite specialized, and they include contractile vacuoles for ridding the cell of excess water and digestive vacuoles for breaking down nutrients.
2- Plant vacuoles contain not only water, sugars, and salts but also pigments and toxic molecules.

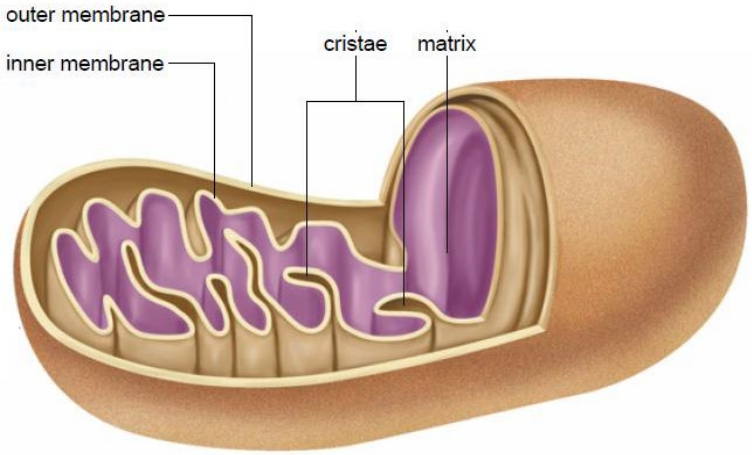
7- Chloroplast

Plant cells contain chloroplasts, the organelles that allow them to produce their own organic food. A chloroplast is bounded by two membranes that enclose a fluid-filled space called the **stroma.** A membrane system within the stroma is organized into **grana**. Chlorophyll, which is located within the membranes of grana, captures the solar energy that is needed to allow chloroplasts to produce carbohydrates. The stroma contains DNA, ribosomes, and enzymes that synthesize carbohydrates from carbon dioxide and water.



8- Mitochondria

Mitochondria, like chloroplasts, are bounded by a double membrane. In mitochondria the inner fluid filled space is called the **matrix.** The matrix contains DNA, ribosomes, and enzymes which break down carbohydrate products, releasing energy that is used for ATP production. The inner membrane of a mitochondrion invaginates to form **cristae.** Cristae provide a much greater surface area to accommodate the protein complexes and other participants that produce ATP.



9-The Cytoskeleton

it's a network of fibers extending throughout the cytoplasm.

Function:

1- Provide mechanical strength to the cell establish cell shape.
2- locomotion (several types of cell motility) intracellular transport of organelles.

Main types of fiber:

1.microtubules: determine the positions of membrane enclosed organelles and intracellular transport.

2.microfilament: determine the shape of the cell and necessary for the whole cell locomotion.

3.intermediate filament: provide mechanical strength and resistance to shear stress.

Q1: Define cristae.
Q2: List the functions of cytoskeleton.

الوحدة الخامسه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define cell and list its types.
2- Compare between prokaryotes and eukaryotes cells and know the differences between them.

موضوعات المحاضرة الاولى:

1- Prokaryotes and Eukaryotes Cells
2- Introduction.
3- Differences.
4- Characteristics.
5- Comparison

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/١/٥) املئ الفراغات • محاضره	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الخامسه	الأولى	نشاط (١/١/٥) املئ الفراغات	٩٠ دقيقة
		اختبار معلومات الطلبه بخصوص المحاضره السابقه	
		القاء المحاضره بشكل فديوي باستخدام شاشه التلفاز	

المادة العلمية:

Eukaryotes and Prokaryotes

With the development of better microscopes, scientists observed that all cells contain small, specialized structures called organelles. Many, but not all, organelles are surrounded by membranes. Each organelle has a specific function in the cell.

Cells: are the basic units of all living things.

All living organisms can be sorted into one of two groups depending on the fundamental structure of their cells: the prokaryotes and the eukaryotes.

1- Prokaryotes are organisms made up of cells that lack a cell nucleus or any membrane-encased organelles.

2- Eukaryotes are organisms made up of cells that possess a membrane-bound nucleus that holds genetic material as well as membrane-bound organelles.

Prokaryotes

Prokaryotes are organisms made up of cells that lack a cell nucleus or any membrane-encased organelles. This means the genetic material DNA in prokaryotes is not bound within a nucleus.

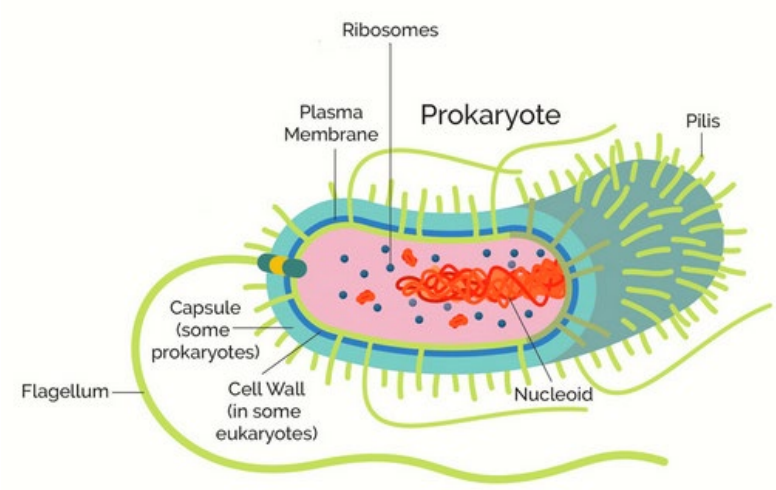
In addition, the DNA is less structured in prokaryotes than in eukaryotes: in prokaryotes, DNA is a single loop while in Eukaryotes DNA is organized into chromosomes.

Most prokaryotes are made up of just a single cell (unicellular) (bacteria) but there are a few that are made of collections of cells (multicellular) (cyanobacteria).

Scientists have divided the prokaryotes into two groups, the Bacteria, and the Archaea.

1- Some bacteria, including E Coli, Salmonella, and Listeria, are found in foods and can cause disease; others are actually helpful to human digestion and other functions.

2- Archaea were discovered to be a unique life form which is capable of living indefinitely in extreme environments such as hydrothermal vents or arctic ice.

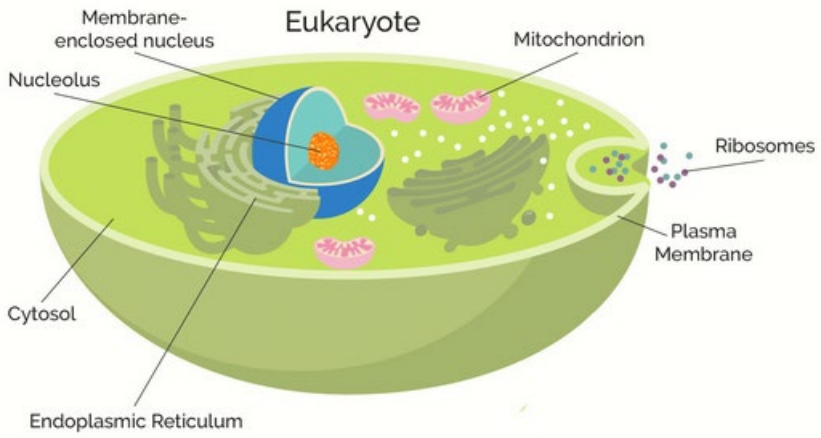


Eukaryotes

Eukaryotes are organisms made up of cells that possess a membrane-bound

nucleus (that holds DNA in the form of chromosomes) as well as membrane-bound organelles. Eukaryotic organisms may be multicellular or single-celled organisms (Algae or Protozoa). All animals are eukaryotes. Other eukaryotes include plants, fungi, and protists.

A typical eukaryotic cell is surrounded by a plasma membrane and contains many different structures and organelles with a variety of functions. Examples include the chromosomes (a structure of nucleic acids and protein which carry genetic information in the form of genes), and the mitochondria (often described as the "powerhouse of the cell").



Comparison Table

	Eukaryotic Cell	**Prokaryotic Cell**
Cell size	10-100um	1-10um
Nucleus	Present	Absent
Number of chromosomes	More than one	One, but not true chromosome: Plasmids
Cell Type	Multicellular	Unicellular
Lysosomes	Present	Absent
Endoplasmic reticulum	Present	Absent
Mitochondria	Present	Absent
Cytoskeleton	Present	May be absent
Ribosomes	larger	smaller
Vesicles	Present	Present

Golgi apparatus	Present	Absent
Chloroplasts	Present (in plants)	Absent; chlorophyll scattered in the cytoplasm
Vacuoles	Present	Present
Example	Animals and Plants	Bacteria

Q1: Fill in the blanks:

	Eukaryotic Cell	**Prokaryotic Cell**
Cell size		
Nucleus		
Number of chromosomes		
Cell Type		

الوحدة السادسه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define cell cycle and explain its phases.
2- Define mitosis and explain its phases.
3- Define cytokinesis.

موضوعات المحاضرة الاولى:

1- Cell cycle
2- Mitosis

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• محاضرة • مناقشة • سؤال وجواب • نشاط (١/١/٦) اوصف الشكل	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
السادسه	الأولى	القاء المحاضرة مستخدما جهاز العرض والسبورة	٩٠ دقيقة
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/١/٦) اوصف الشكل	

المادة العلمية:

Cell cycle

The cell cycle is the sequence of growth and division of a cell.

As a cell proceeds through its cycle, it goes through two general periods: a period of growth and a period of division.

Interphase: During interphase, a cell grows in size and carries on metabolism. Also, during this period, chromosomes are duplicated in preparation for the period of division.

The interphase is divided into three further phases:

l- G1 phase (Gap 1): G1 phase corresponds to the interval between mitosis and initiation of DNA replication. During G1 phase the cell is metabolically active and continuously grows but does not replicate its DNA.

2- S phase (Synthesis): S or synthesis phase marks the period during which DNA synthesis or replication takes place. During this time the amount of DNA per cell doubles.

3- G2 phase (Gap 2): During the G2 phase, proteins are synthesized in preparation for mitosis while cell growth continues.

Cells differ in the length of time it takes them to complete the cell cycle. The difference seems to depend on how long they spend in G1. There are even some human cells such as nerve cells and skeletal muscle cells that become permanently arrested in G1, and these cells are said to have entered a G0 stage.

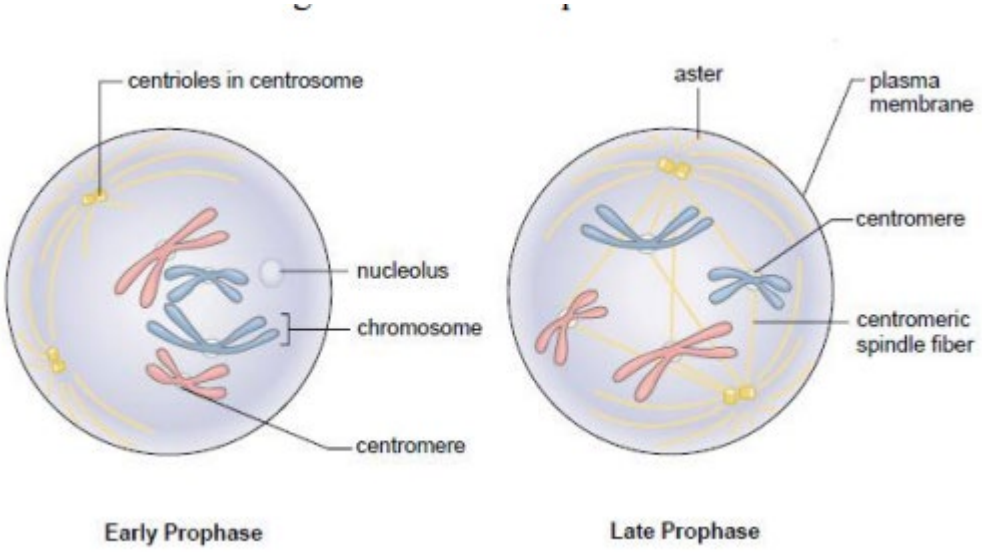
Mitosis: is the process by which two daughter cells are formed, each containing a complete set of chromosomes. Mitosis has been divided into four stages of

nuclear division (karyokinesis). The completion of prophase can thus be marked by the following characteristic events:

l- Prophase:

Early Prophase: Chromosomal material condenses to form compact mitotic chromosomes. Chromosomes are seen to be composed of two chromatids attached together at the centromere.

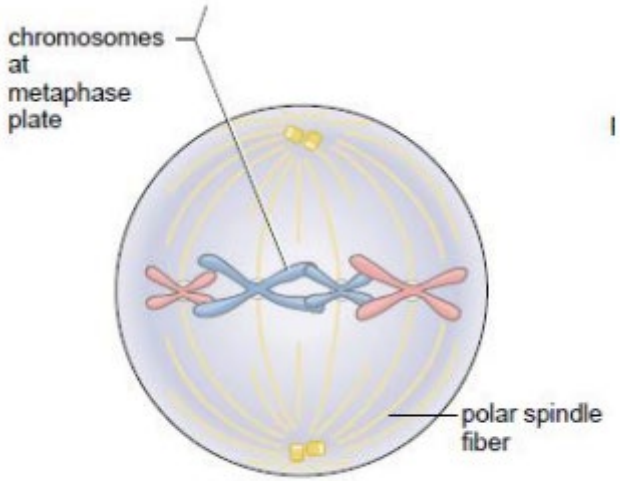
Late Prophase: Centrosome which had undergone duplication during interphase, begins to move towards opposite poles of the cell. Each centrosome radiates out microtubules called asters. The two asters together with spindle fibers forms mitotic apparatus.



2- Metaphase: the metaphase is characterized by all the chromosomes coming to lie at the equator with one chromatid of each chromosome connected by its kinetochore to spindle fibers from one pole and its sister chromatid connected by its kinetochore to spindle fibers from the opposite pole. The plane of alignment of the chromosomes at metaphase is referred to as the metaphase plate. The key features of metaphase are:

l- Spindle fibers attach to kinetochores of chromosomes.

2- Chromosomes are moved to spindle equator and get aligned along metaphase plate through spindle fibers to both poles.



Metaphase

3- Anaphase: each chromosome arranged at the metaphase plate is split simultaneously and the two daughter chromatids, now referred to as daughter chromosomes of the future daughter nuclei, begin their migration towards the two opposite poles. Thus, anaphase stage is characterized by the following key events:

l- Centromeres split and chromatids separate.

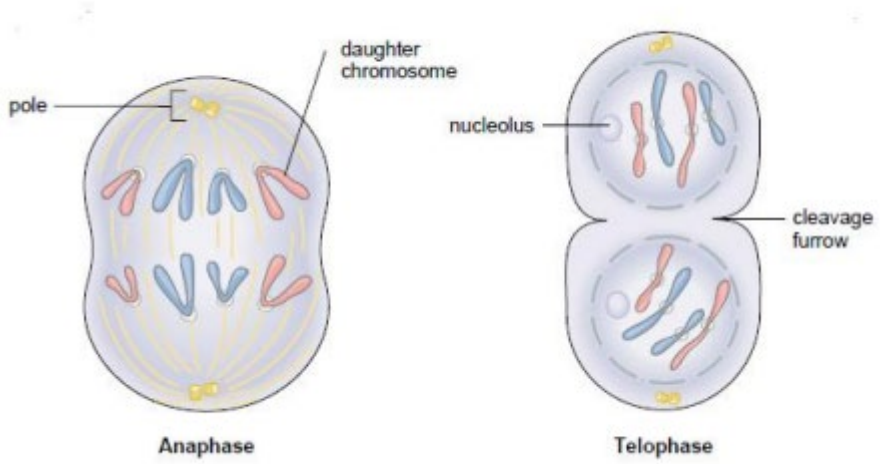
2- Chromatids move to opposite poles.

4-Telophase: This is the stage which shows the following key events:

l- Chromosomes cluster at opposite spindle poles and their identity is lost as discrete elements.

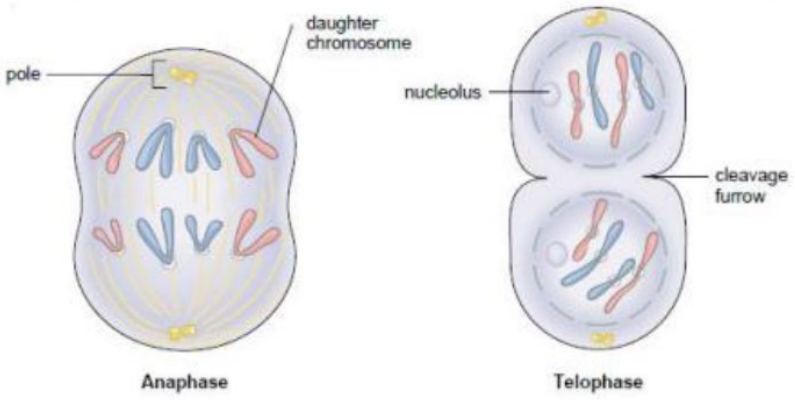
2- Nuclear envelope develops around the chromosome clusters at each pole forming two daughter nuclei.

3- Nucleolus, golgi complex and ER reform.



Cytokinesis: the cytoplasm divides, separating the two daughter cells.

Q1: Describe these phases in brief:



الوحدة السادسه - المحاضرة الثانيه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثانيه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define meiosis.
2- List meiosis phases and explain their events.
3- Compare between Mitosis and meiosis.
4- Describe the types of cell that result from meiosis.

موضوعات المحاضرة الثانيه:

1- Meiosis

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• تبادل الادوار • مناقشة • نشاط (١/٢/٦) خيارات متعددة	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثانيه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
السادسه	الثانيه	السماح للطلبه بالقاء المحاضره	٩٠ دقيقة
		طرح بعض الاسئلة	
		نشاط (١/٢/٦) خيارات متعددة	

المادة العلمية:

Meiosis

This kind of cell division, which produces gametes containing half the number of chromosomes as a parent's body cell, is called meiosis (mi OH sus). Meiosis occurs in the specialized body cells of each parent that produce gametes. Meiosis consists of two separate divisions, known as meiosis I and meiosis II. Meiosis I

begin with one diploid (2n) cell. By the end of meiosis II, there are four haploid (n) cells.

These haploid cells are called sex cells (gametes). Male gametes are called **sperm**. Female gametes are called **eggs**. When a sperm fertilizes an egg, the resulting zygote once again has the diploid number of chromosomes.

The Phases of Meiosis

Interphase

during interphase, the cell replicates its chromosomes.

Prophase I

The DNA of the chromosomes coils up and a spindle forms. As the DNA coils, homologous chromosomes line up with each other, gene by gene along their length, to form a four-part structure called a tetrad. A tetrad consists of two homologous chromosomes, each made up of two sister chromatids. The chromatids in a tetrad pair tightly. In fact, they pair so tightly that non-sister chromatids from homologous chromosomes can actually break and exchange genetic material in a process known as crossing over. Crossing over can occur at any location on a chromosome, and it can occur at several locations at the same time.

Metaphase I

During metaphase I, the centromere of each chromosome becomes attached to a spindle fiber. The spindle fibers pull the tetrads into the middle, or equator, of the spindle. This is an important step unique to meiosis. Note that homologous chromosomes are lined up side by side as tetrads. In mitosis, on the other hand, they line up on the spindle's equator independently of each other.

Anaphase I

Anaphase I begin as homologous chromosomes, each with its two chromatids, separate and move to opposite ends of the cell. This separation occurs because the centromeres holding the sister chromatids together do not split as they do during anaphase in mitosis. This critical step ensures that each new cell will receive only one chromosome from each homologous pair.

Telophase I

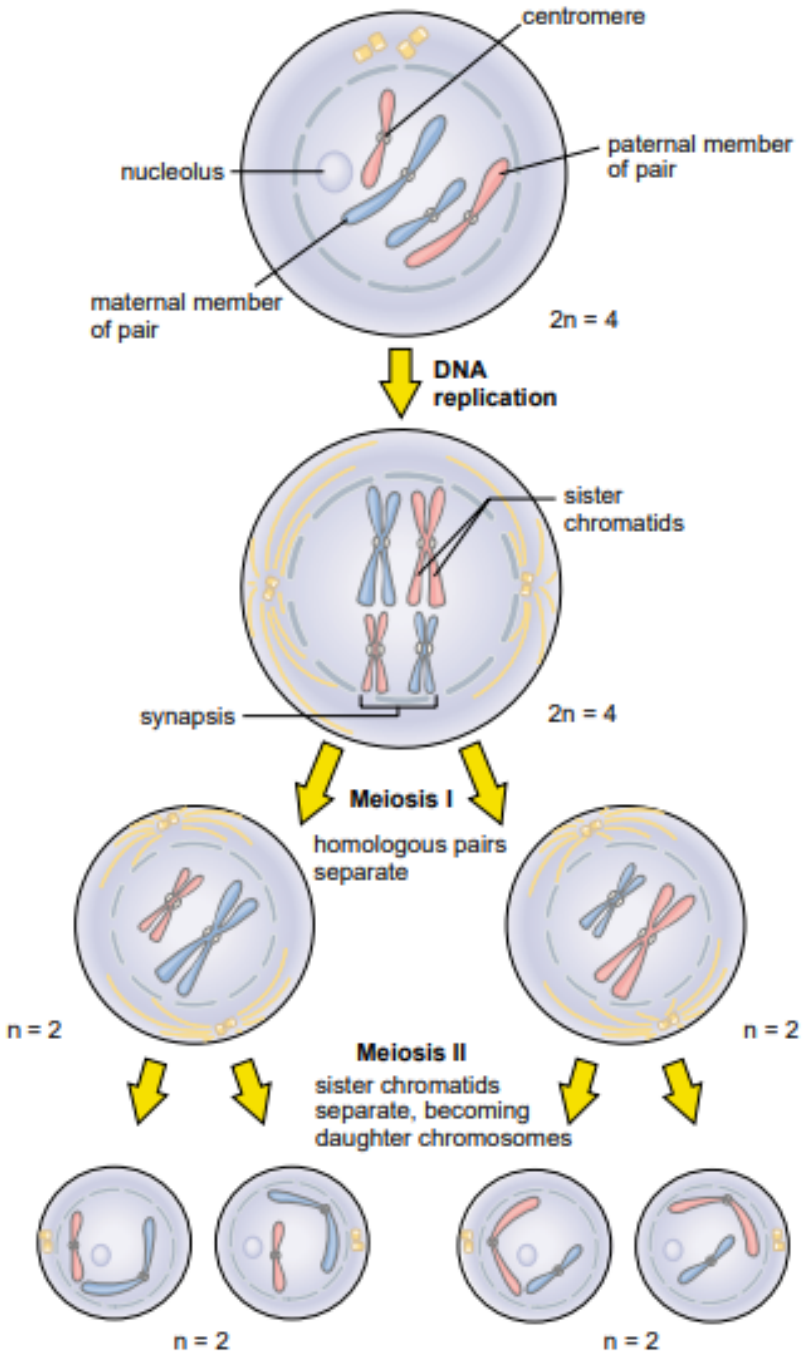
Events occur in the reverse order from the events of prophase I. The spindle is broken down, the chromosomes uncoil, and the cytoplasm divides to yield two new cells. Each cell has half the genetic information of the original cell because it has only one chromosome from each homologous pair. However, another cell division is needed because each chromosome is still doubled.

Meiosis II

Meiosis II consists of prophase II, metaphase II, anaphase II, and telophase II. During prophase II, a spindle forms in each of the two new cells and the spindle fibers attach to the chromosomes. The chromosomes, still made up of sister chromatids, are pulled to the center of the cell and line up randomly at the equator during metaphase II. Anaphase II begins as the centromere of each chromosome splits, allowing the sister chromatids to separate and move to opposite poles. Finally, nuclei re-form, the spindles break down, and the cytoplasm divides during telophase II. The events of meiosis II are identical to those you studied for mitosis except that the chromosomes do not replicate before they divide at the centromeres.

At the end of meiosis II, four haploid cells have been formed from one diploid cell. Each haploid cell contains one chromosome from each homologous pair. These haploid cells will become gametes, transmitting the genes they contain to offspring.

Mitosis	Meiosis
1) It occurs in somatic cells.	1) It occurs in germ cells.
2) Nucleus divides only once.	2) Nucleus divides twice.
3) Two daughter cells are formed.	3) Four daughter cells are formed.
4) Daughter cells are diploid.	4) Daughter cells are haploid.
5) It occurs more frequently.	5) It occurs less frequently.
6) Daughter cells form somatic organs.	6) Daughter cells form gametes.
7) There is only one prophase, one metaphase one anaphase and one telophase.	7) There are two of each phase
8) Number of chromosomes are not changed in the daughter cells.	8) Number of chromosomes are reduced to half.
9) No crossing over in chromosomes.	10) Crossing over occurs chromosomes.



Q1: Compare between mitosis and meiosis

Mitosis	Meiosis

الوحدة السادسه - المحاضرة الثالثه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثالثه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Types of Nucleic Acids
2- The structure of nucleotides
3- Define DNA and mention its structure and functions
4- Define RNA and mention its structure and functions
5- Compare between DNA and RNA.

موضوعات المحاضرة الثالثه:

1- DNA and RNA Structures.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/٣/٦) مقارنه • فديو • مناقشه	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثالثه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
السادسه	الثالثه	نشاط (١/٣/٦) مقارنه	٩٠ دقيقة
		اختبار معلومات الطلبه عن موضوع المحاضره	
		عرض فديو يخص المحاضره	

المادة العلمية:

DNA and RNA Structures

Nucleic Acid The nucleic acids are the building blocks of living organisms. They are molecules that allow organisms to transfer genetic information from one generation to the next. They are the polynucleotides having high molecular weight. The monomeric unit of which is nucleotide. All the types of NA's work together to help cells replicate and build proteins.

Types of Nucleic Acids:

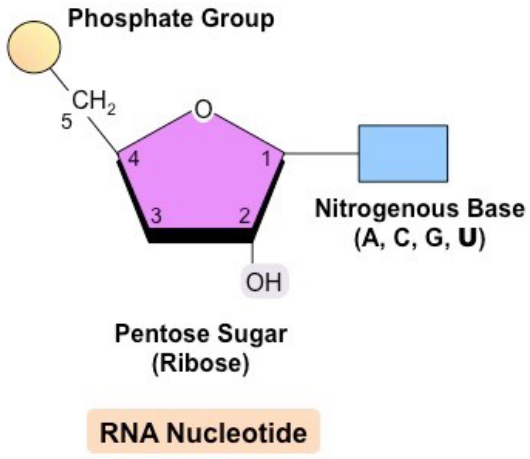
1) Deoxyribonucleic acid (DNA).

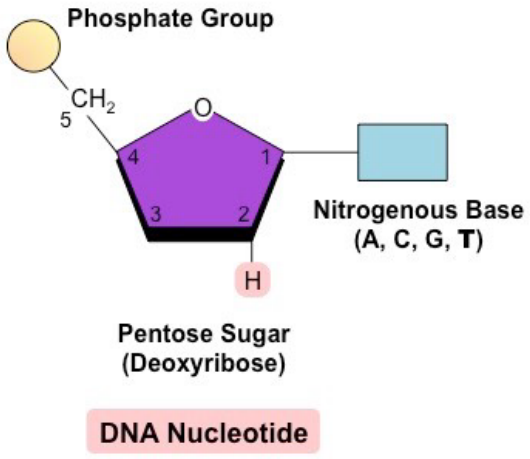
2) Ribonucleic Acid (RNA).

The structure of nucleotides

DNA is a polymer made of repeating subunits called nucleotides. Nucleotides have three parts: a simple sugar, a phosphate group, and a nitrogenous base. The simple sugar in DNA, called deoxyribose, gives DNA its name deoxyribonucleic acid.

A nitrogenous base is a carbon ring structure that contains one or more atoms of nitrogen. In DNA, there are four possible nitrogenous bases: adenine (A), guanine (G), cytosine (C), and thymine (T). Thus, in DNA there are four possible nucleotides, each containing one of these four bases.



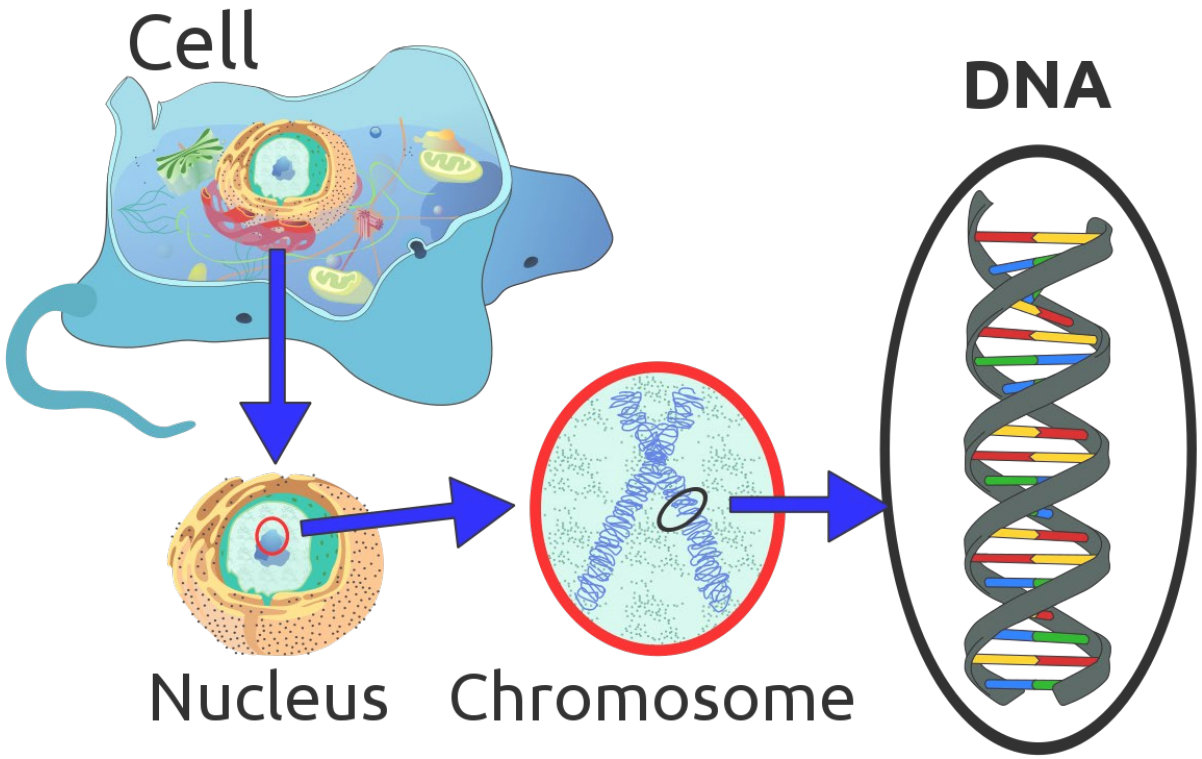


DNA Definition

DNA (deoxyribonucleic acid) is a type of macromolecule known as a nucleic acid. It is shaped like a twisted double helix and is composed of long strands of alternating sugars and phosphate groups, along with nitrogenous bases (adenine, thymine, guanine and cytosine).

DNA Location

DNA is organized into structures called chromosomes and housed within the nucleus of our cells.



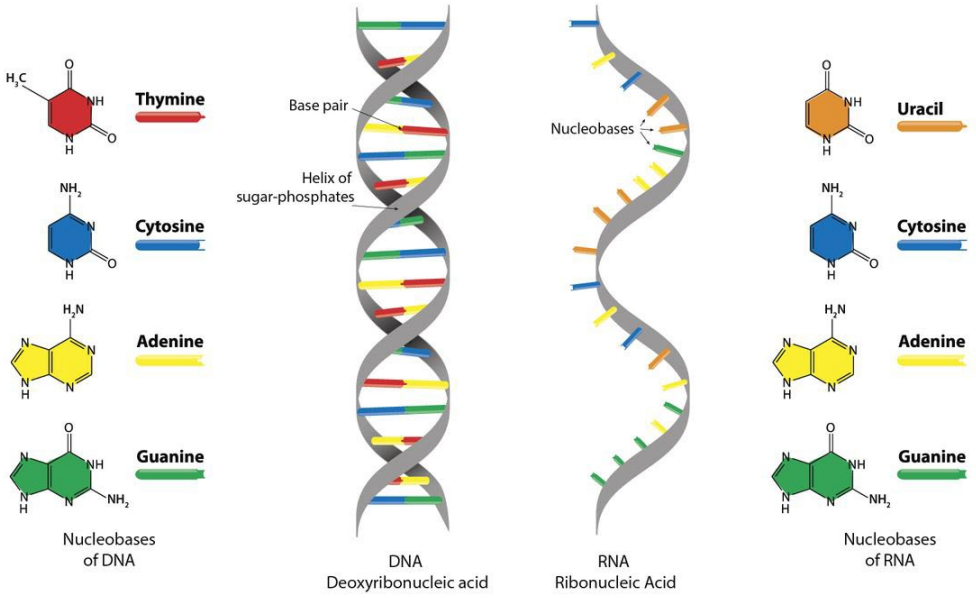
Function of deoxyribonucleic acid (DNA)

1- Give genetic instruction.
2- DNA stores information to tell cells how to function, passing it on to the next generation of life through cells. It also helps in development.

DNA Structure

Watson and Crick proposed that DNA is made of two chains of nucleotides held together by nitrogenous bases. Hydrogen bonds can form only between certain bases, so the bases on one strand determine the bases on the other strand. Specifically, adenine on one strand pairs only with thymine on the other strand, and guanine on one strand pairs only with cytosine on the other strand. Crick also

proposed that DNA is shaped like a long zipper that is twisted into a coil like a spring. When something is twisted like a spring, the shape is called a helix. Because DNA is composed of two strands twisted together, its shape is called a double helix.



RNA

RNA, like DNA, is a nucleic acid. RNA structure differs from DNA structure in three ways.

• First, RNA is single stranded (it looks like one-half of a zipper) whereas DNA is double stranded.

• Second, the sugar in RNA is ribose; DNA's sugar is deoxyribose.

Differences between DNA and RNA

RNA	DNA
Single stranded	Double stranded
Ribose is the main sugar	The sugar is deoxyribose
adenine (A), guanine (G), cytosine (C), Uracil (U)	adenine (A), guanine (G), cytosine (C), and thymine (T)

Q1: Compare between DNA and RNA:

DNA	RNA

الوحدة السادسه - المحاضرة الرابعه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الرابعه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define genetic code and codon.
2- Describe the following terms: (Replication, Translation, Transcription and Mutation).

موضوعات المحاضرة الرابعه:

1. Genetic codes.
2. Replication, Translation, Transcription and Mutation.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• محاضرة • مناقشة • سؤال وجواب • نشاط (١/٤/٦) تعريف	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

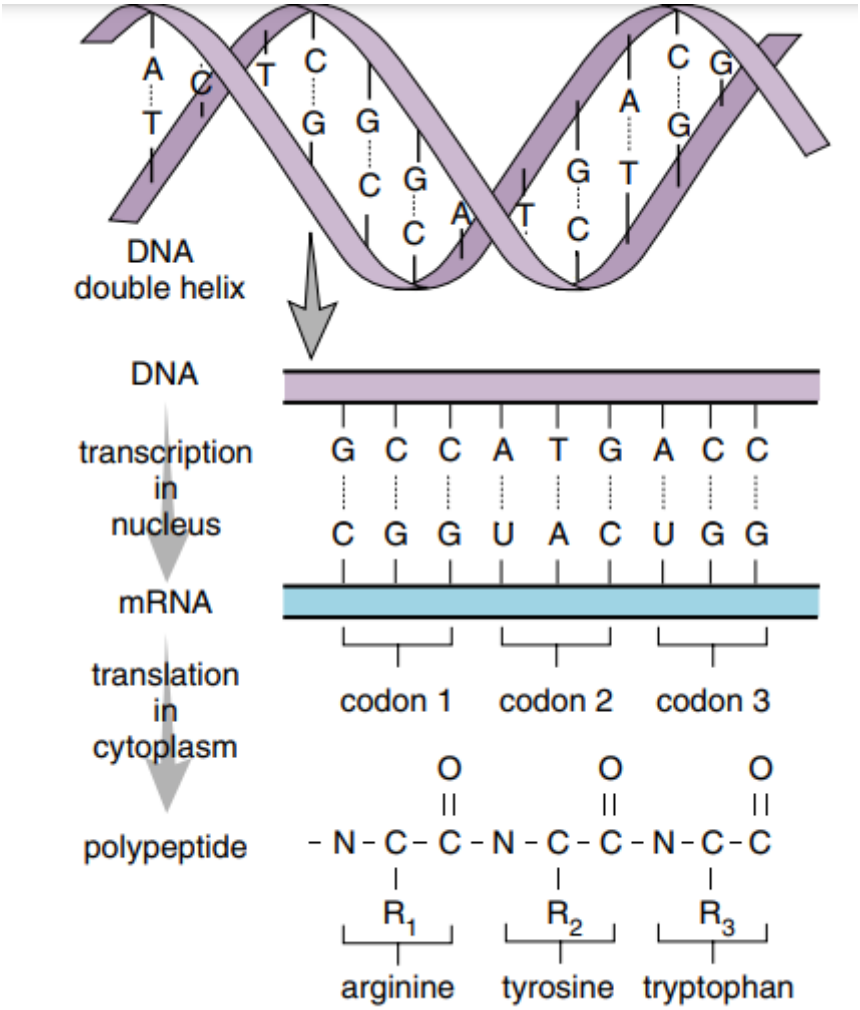
خطة إجراءات تنفيذ المحاضرة الرابعه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
السادسه	الرابعه	القاء المحاضرة مستخدما جهاز العرض والسبورة	٩٠ دقيقة
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/٤/٦) تعريف	

المادة العلمية:

The Genetic Code

DNA has a particular sequence of bases, and a polypeptide has a particular sequence of amino acids. This suggests that DNA contains coded information. Each three-letter unit of an mRNA molecule is called a **codon**.



DNA replication

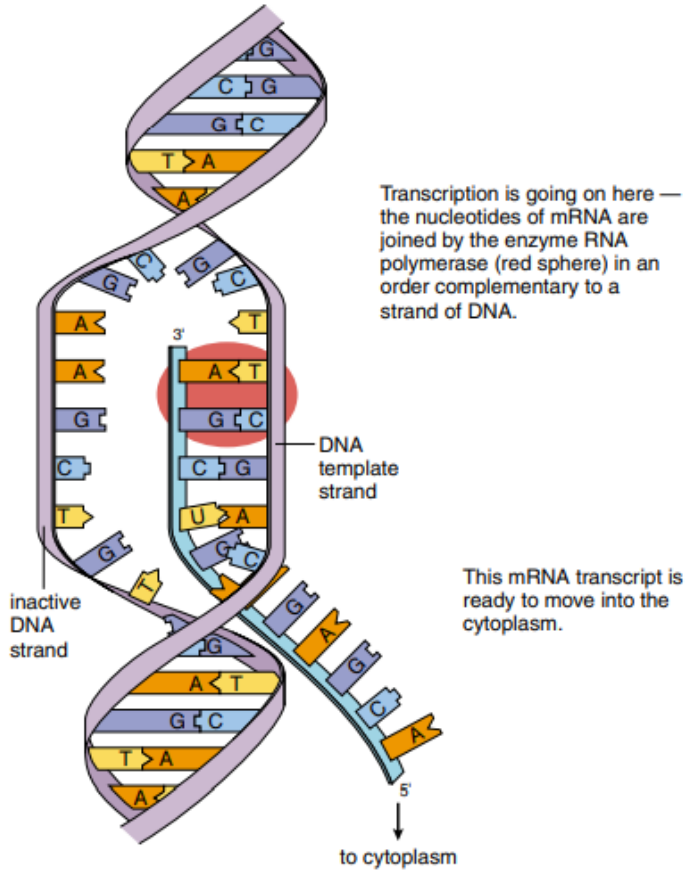
Each time a cell divides, each of its double strands of DNA splits into two single strands. Each of these single strands acts as a template for a new strand of complementary DNA. As a result, each new cell has its own complete genome. This process is known as DNA replication.

Transcription

Transcription is the process by which DNA is copied (transcribed) to mRNA, which carries the information needed for protein synthesis.

During transcription, a segment of the DNA helix unwinds and unzips, and complementary RNA nucleotides from an RNA nucleotide pool in the nucleus pair with the DNA nucleotides of one strand.

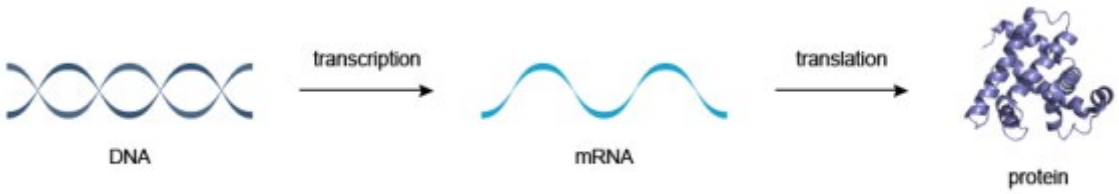
The RNA nucleotides are joined by an enzyme called **RNA polymerase**, and an mRNA molecule results. Therefore, when mRNA forms, it has a sequence of bases complementary to DNA; wherever A, T, G, or C is present in the DNA template, U, A, C, or G is incorporated into the mRNA molecule. In this way, the code is transcribed, or copied. Now mRNA has a sequence of codons, three bases that are complementary to the DNA triplet code.



Translation

The process by which mRNA directs protein synthesis with the assistance of tRNA is called translation.

During translation, the sequence of codons in mRNA specifies the order of amino acids in a polypeptide. This is called translation because the sequence of DNA and then RNA bases is translated into a sequence of amino acids. Translation requires several enzymes and two other types of RNA: transfer RNA and ribosomal RNA.



Q1: Define codon

الوحدة السابعه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- List the organ systems of the body.
2- Describe each system and write its functions.

موضوعات المحاضرة الاولى:

1. Organ Systems
2. Introduction.
3. Digestive system.
4. Circulatory system.
5. Respiratory system.
6. Urinary system.
7. Muscular system.
8. Nervous systems

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• محاضرة • فديو توضيحي • نشاط (١/١/٧) وضح	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
السابعه	الأولى	القاء المحاضره بواسطه شاشة التلفاز	٩٠ دقيقة
		عرض فديو توضيحي لترسيخ المعلومات في ذهن الطلبه	
		نشاط (١/١/٧) وضح	

المادة العلمية:

Organ Systems

The body contains a number of organ systems. The skin, which is sometimes called the integumentary system.

Maintenance of the Body The internal environment of the body consists of the blood within the blood vessels and the tissue fluid that surrounds the cells. Five systems add substances to and remove substances from the blood:

1- The digestive system.
2- Cardiovascular system.
3- Lymphatic system.
4- Respiratory system.
5- Urinary systems.

The digestive system consists of the mouth, esophagus, stomach, small intestine, and large intestine (colon) along with the associated organs: teeth, tongue, salivary glands, liver, gallbladder, and pancreas. This system receives food and digests it into nutrient molecules, which can enter the cells of the body.

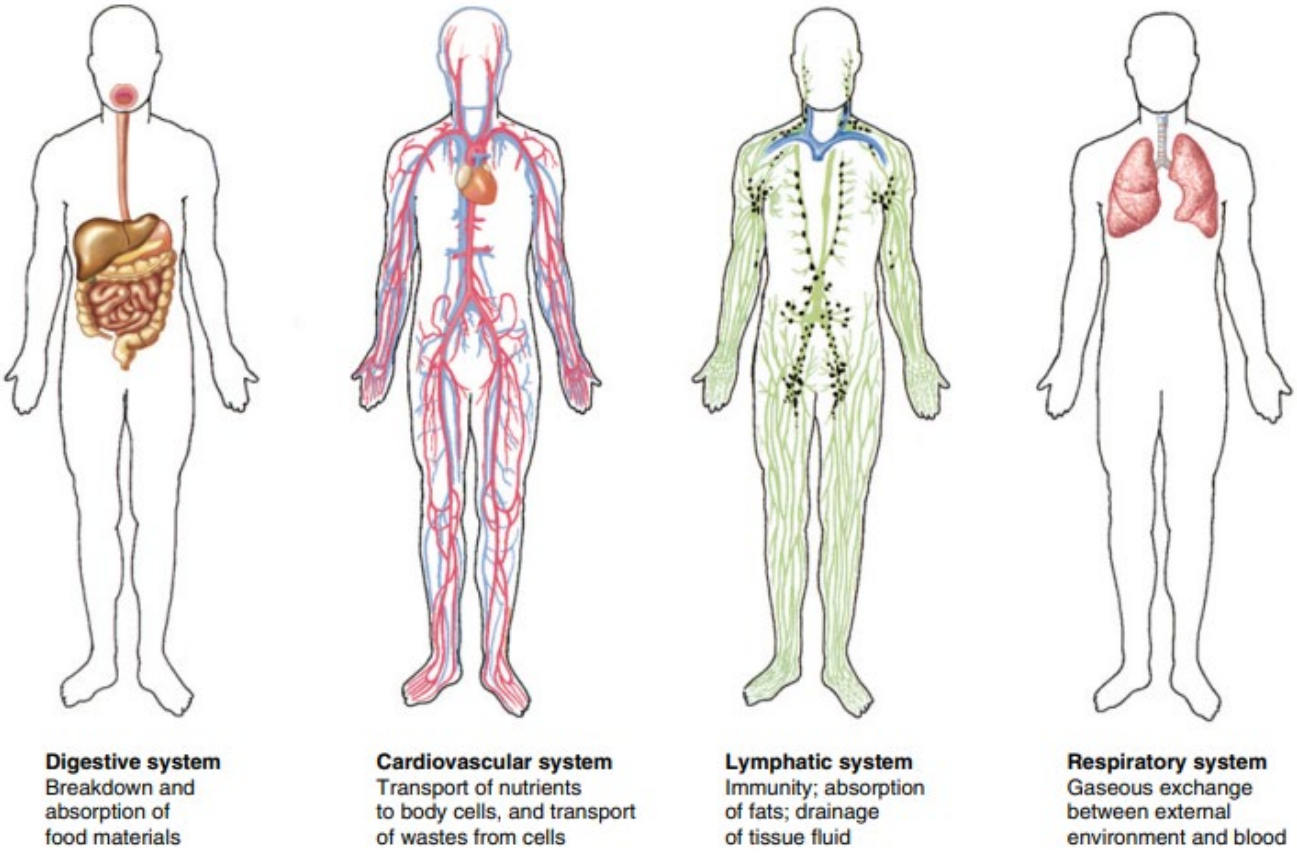
The cardiovascular system consists of the heart and blood vessels that carry blood through the body. Blood transports nutrients and oxygen to the cells, and removes their waste molecules that are to be excreted from the body. Blood also contains cells produced by the lymphatic system.

The lymphatic system consists of lymphatic vessels, lymph, nodes, and other lymphoid organs. This system protects the body from disease by purifying lymph and storing lymphocytes, the white blood cells that produce antibodies. Lymphatic vessels absorb fat from the digestive system and collect excess tissue fluid, which is returned to the cardiovascular system.

The respiratory system consists of the lungs and the tubes that take air to and from the lungs. The respiratory system brings oxygen into the lungs and takes carbon dioxide out of the lungs.

The urinary system contains the kidneys and the urinary bladder. This system rids the body of nitrogenous wastes and helps regulate the fluid level and chemical content of the blood.

Q1: Explain the functions of circulatory system.



الوحدة الثامنه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define virus.
2- Define bacteriophages.
3- Explain viral infections.
4- Classification of viruses based on their orders and families.
5- Define Hepatis virus and compare between its types.

موضوعات المحاضرة الاولى:

1- Viruses
2- Introduction.
3- Types of viruses.
4- Bacteriophages.
5- Viral Life cycle.
6- Viral Human Diseases.
7- Harmful of viruses.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/١/٨) تعريف • تبادل الادوار	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الثامنه	الأولى	نشاط (١/١/٨) تعريف	٩٠ دقيقة
		اختبار معلومات الطلبه عن موضوع المحاضره قبل القائها	
		السماح للطلبه بقراءة المحاضره	
		تبادل الاسئله والمعلومات بين الطلبه	

المادة العلمية:

Viral Infections

A virus defines as **obligate intracellular parasite** consists of a single nucleic acid, RNA or DNA, surrounded by a protein coat, and is capable of replication only within the living cells of bacteria, animals or plants.

Viruses are classified into different orders and families by consideration of:

1- The type of nucleic acid present (RNA or DNA).

2- The nucleic acid is single- or double-stranded.

3- The presence or absence of an envelope.

Hepatitis

Definition:

Hepatitis is the inflammation of the liver. The condition can progress to fibrosis (scarring), cirrhosis or liver cancer.

Causes of hepatitis

1- Hepatitis viruses are the most common cause of hepatitis in the world.

2- It can cause by other infections, toxic substances (e.g. alcohol, certain drugs), and autoimmune diseases can also cause hepatitis.

Viral hepatitis

Is caused by infection with one of the five known viruses, the hepatitis A, B, C, D and E viruses (**HAV**, **HBV**, **HCV**, **HDV** and **HEV**).

Modes of transmission for these viruses include:

•Hepatitis A and E are typically caused by ingestion of contaminated food or water .

•Hepatitis B, C and D usually occur as a result of parenteral contact with infected body fluids.

Symptoms

1- Acute infection may occur with limited or no symptoms.

2- Or show symptoms such as jaundice (yellowing of the skin and eyes), dark urine, extreme fatigue, nausea, vomiting and abdominal pain.

What are the different hepatitis viruses?

1- Hepatitis A virus (HAV) is present in the faeces of infected persons and is most often transmitted through consumption of contaminated water or food.

2- Hepatitis B virus (HBV) is transmitted through exposure to contaminated blood and blood products, contaminated injections during medical procedures, and through injection drug use, semen, and other body fluids.

HBV can be transmitted from infected mothers to infants at the time of birth.

3- Hepatitis C virus (HCV) is mostly transmitted through exposure to infective blood and blood products, contaminated injections during medical procedures, and through injection drug use. Sexual transmission is also possible but is much less common.

4- Hepatitis D virus (HDV) infections occur only in those who are infected with HBV.

5- Hepatitis E virus (HEV) is mostly transmitted through consumption of contaminated water or food.

Q1: Define bacteriophages.

الوحدة التاسعه - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Discus kingdom Monera.
2- Define the following terms (flagella, fimbriae and plasmids).
3- Explain the metabolism of bacteria.
4- Classify of Bacteria.

موضوعات المحاضرة الاولى:

1. Kingdom OF Monera
2. Introduction.
3. Phylum Schizophyta (Bacteria).
4. Classification.
5. Structure.
6. Morphology
7. Growth and Function
8. Motility
9. Harmfull Activity of Bacteria.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• محاضرة • نشاط (١/١/٩) مقارنه • سؤال وجواب	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
التاسعه	الأولى	القاء المحاضرة مع عرض فديو توضيحي	٩٠ دقيقة
		نشاط (١/١/٩) مقارنه	
		طرح بعض الاسئلة قبل نهاية المحاضرة لمعرفه مستوى فهم الطلبه للماده	

المادة العلمية:

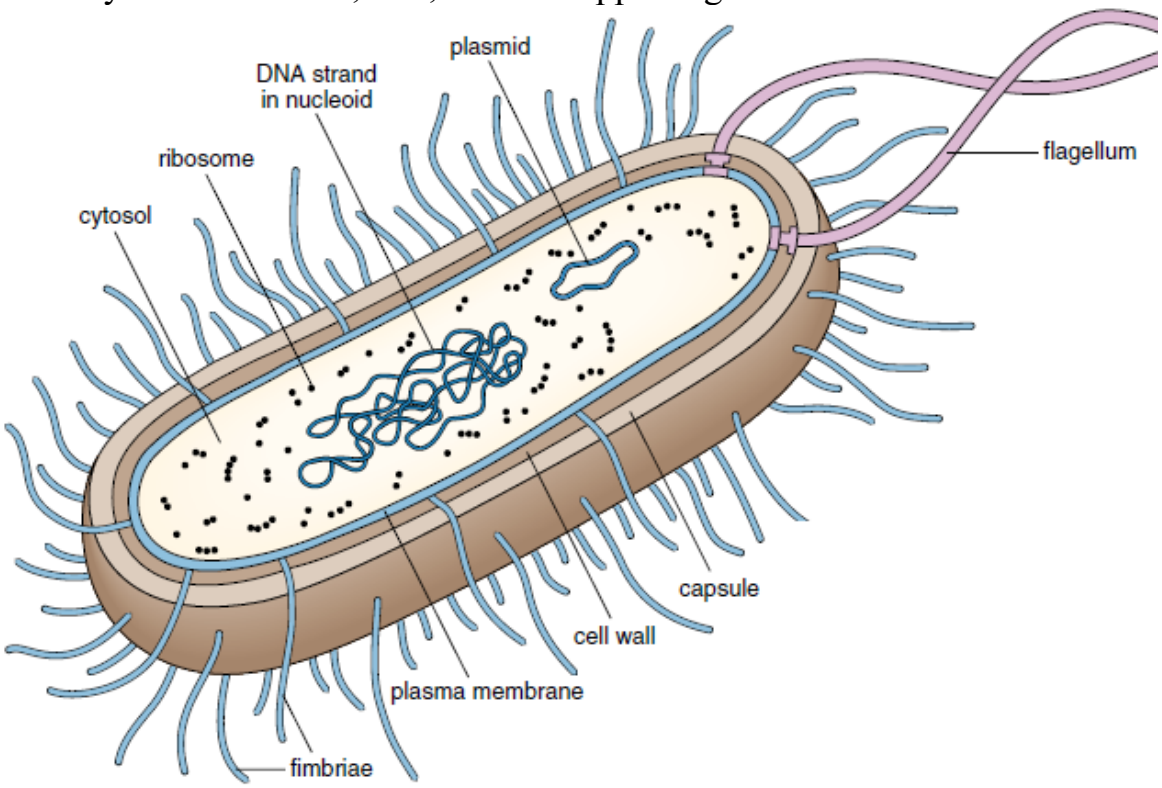
Kingdoms of Life – Monera

Kingdom Monera contains the **bacteria**, which are prokaryotes.

Structure of Bacteria

Prokaryotic cells are very small. They do have a chromosome, but it is contained within a **nucleoid,** which has no nuclear envelope; therefore, bacteria are said to lack a nucleus.

Many bacteria have DNA called **plasmids**. Bacteria have a cell wall surrounded by a **capsule**. Some bacteria move by means of **flagella**, and some adhere to surfaces by means of short, fine, hair like appendages called **fimbriae**.



Metabolism of Bacteria

1- Some bacteria are **obligate anaerobes**, unable to grow in the presence of oxygen.

2- Some other bacteria, called **facultative anaerobes**, are able to grow in either the presence or the absence of oxygen.

3- Most bacteria are **aerobic** and, like animals and plants, require a constant supply of oxygen to carry out cellular respiration.

Types of bacteria according to the source of energy:

1- Some bacteria are **autotrophic** by photosynthesis*;* they use light as a source of energy to produce their own food such as *Cyanobacteria*.

2- Most types of bacteria are **heterotrophic** by absorption. They are **saprotrophs,** organisms that carry on external digestion of organic matter and absorb the resulting nutrients across the plasma membrane.

3- Bacteria are often **symbiotic;** they live in association with other organisms. The nitrogen-fixing bacteria in the nodules of legumes*,* or the bacteria that live within our own intestinal tract.

Classification of Bacteria

Classification bacteria based on their shapes:

1- Rod (bacillus, pl., bacilli).

2- Round or spherical (coccus, pl., cocci).

3- Spiral (spirillum, pl., spirilli).

a. Bacilli in pairs b. Cocci in chains c. A spirillum with flagella

Classification bacteria based on Gram's staining

A- Gram-positive bacteria retain a dye-iodine complex and appear purple under the light microscope because have a thick layer of peptidoglycan on their cell wall.

B- Gram-negative bacteria do not retain the a dye-iodine complex and appear pink because have only a thin layer.

1- Crystal violet	primary stain
2- Iodine solution/Gram's Iodine	mordant that fixes crystal violet to cell wall
3- Decolorizer	e.g. ethanol
4- Safranin	secondary stain
5- Water	preferably in a squirt bottle

Harmful Activity of Bacteria

Bacteria cause diseases in plants and animals, causing crops and livestock losses that impact humans indirectly. Bacteria also cause many human diseases. Disease-causing bacteria can enter human bodies through openings, such as the mouth. They are carried in air, food, and water and sometimes invade humans through skin wounds. Bacterial diseases harm people in two ways. The growth of the bacteria can interfere with the normal function of body tissue, or it can release a toxin that directly attacks the host.

Q1: Compare between:

Gram-positive bacteria	Gram-negative bacteria

الوحدة العاشره - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1-Classify kingdom Protista.
2- Classify algae.

موضوعات المحاضرة الاولى:

1- Kingdom Protista.
2- Algae (Golden Brown Algae, Dinoflagellates, Euglenoids and Red Algae).

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• تبادل الادوار • الاجابه عن الاسئلة • نشاط (١/١/١٠) وضح	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
العاشره	الأولى	السماح للطلبه بقراءة المحاضره وتفسير النقاط المفهومه	٩٠ دقيقة
		اجابة اسئلة الطلبه خلال قراءة المحاضره	
		نشاط (١/١/١٠) وضح	

المادة العلمية:

Kingdom Protista

The protists are eukaryotes; their cells have a nucleus. Unicellular organisms are predominant, and even the multicellular forms lack the tissue differentiation that is seen in more complex organisms. The protists are grouped according to their mode of nutrition and other characteristics into these categories:

Algae	Protozoans	Slime Molds	Water Molds
Phylum Chlorophyta: green algae	Phylum Sarcodina: amoebas and allies	Phylum Gymnomycota: slime molds	Phylum Oomycota: water molds
Phylum Phaeophyta: brown algae	Phylum Ciliophora: ciliates		
Phylum Chrysophyta: diatoms	Phylum Zoomastigophora: zooflagellates		
Phylum Dinoflagella: dinoflagellates	Phylum Sporozoa: sporozoa		
Phylum Euglenophyta: euglenoids			
Phylum Rhodophyta: red algae			

Algae

Algae are autotrophic by photosynthesis like plants that produce the food to maintains communities of organisms in both the oceans and bodies of

fresh water. All algae contain chlorophyll, but they may also contain other pigments that mask the color of the chlorophyll.

Algae are grouped according to their color (green, golden brown, brown, and red algae) and biochemical differences, such as the chemistry of the cell wall and the way they store reserve food.

Phylum Chlorophyta: Green Algae

Live in the ocean, but they are more likely found in fresh water and can even be found on land. Green algae are believed to be closely related to the first plants because both of these groups:

- Have a cell wall that contains cellulose.
- Possess chlorophylls a and b.
- Store reserve food as starch inside the chloroplast. (Other types of algae store reserve food outside the chloroplast.)

Examples:

Types	Example	Chloroplast shape
Unicellular Green Algae	Chlamydomonas	Single, cup-shaped chloroplast
Colonial Green Algae	Volvox	Filamentous
Multicellular Green Algae	Spirogyra	Ribbonlike
Multicellular Green Algae	Ulva	

Phylum Phaeophyta: Brown Algae

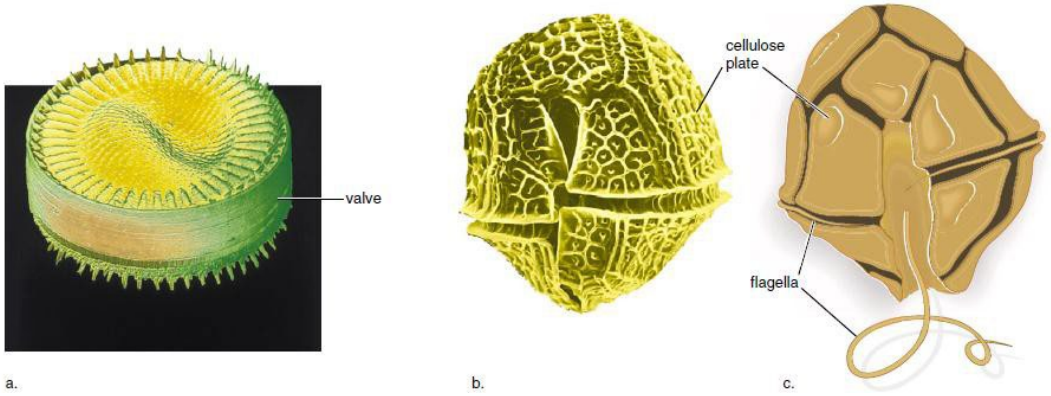
Phylum Chrysophyta: Golden Brown Algae

Brown and golden-brown algae have chlorophylls a and c in their chloroplasts and a type of carotenoid pigment (fucoxanthin) that gives them their color.

Brown algae range from small forms with simple filaments to large blade forms between 50 meters and 100 meters in length.

Diatoms are a type of unicellular golden-brown algae. The structure of a diatom is often compared to a box because the cell wall has two valves, with the larger valve acting as a “lid” for the smaller valve.

Phylum Dinoflagella: Dinoflagellates Many dinoflagellates are bounded by protective cellulose plates. Most have two flagella; one is free, but the other is located in a transverse groove. The beating of the flagella causes the organism to spin. When surface waters are warm and nutrients are high, there are so many of these unicellular organisms in the ocean that they cause a condition called "red tide." Toxins in red tides cause widespread fish kills.



a. Diatoms, b. Dinoflagellates

Phylum Euglenophyta: Euglenoids

Are small, freshwater unicellular organisms in which One-third of all genera have chloroplasts; the rest do not. Euglenoids have two flagella, one of which typically is much longer than the other and projects out of an anterior vase-shaped invagination. There is a contractile vacuole for ridding the body of excess water.

Phylum Rhodophyta: Red Algae

Are multicellular, but they live chiefly in warmer seawater, growing in both shallow and deep waters. Red algae are usually much smaller and more delicate than the brown algae, although they can be up to a meter long. Some forms of red algae are simple filaments, but more often they are complexly branched, with the branches having a feathery, flat, or expanded ribbonlike appearance. Example: Coralline algae.

Their economic importance: culture medium for bacteria and food preparation (agar). For making dental impressions, and base for cosmetics.

Q1: Green algae are believed to be closely related to the first plants

الوحدة العاشره - المحاضرة الثانيه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثانيه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Explain the following terms (Ciliates, Zooflagellates, Amoeboids and Sporozoa).

موضوعات المحاضرة الثانيه:

1- Phylum of Sarcodina, Amoebas.
2- Phylum of Zoomastigina, Trypanosoma, Giardia.
3- Phylum of Sporozoa, Plasmodium.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/٢/١٠) عرض تقديمي • محاضره	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثانيه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
العاشره	الثانيه	نشاط (١/٢/١٠) عرض تقديمي	٩٠ دقيقة
		اختبار معلومات الطلبه قبل القاء المحاضره	
		القاء المحاضره باستخدام جهاز التلفاز	

المادة العلمية:

Protista – Protozoans

Protozoans are typically heterotrophic, motile, unicellular organisms of small size. Protozoans usually live in water, but they can also be found in moist soil or inside other organisms.

Some protozoans engulf whole food and are termed **holozoic**; others are **saprotrophic**, and they absorb nutrient molecules across the plasma membrane. Still others are

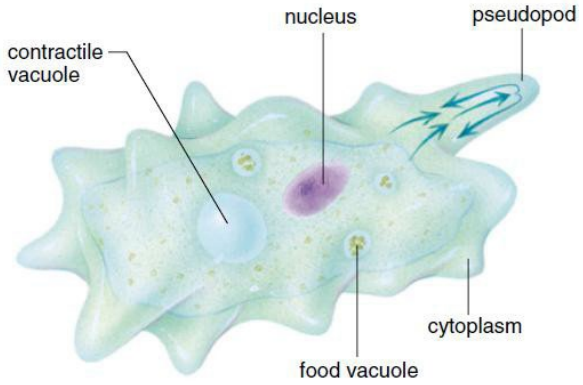
parasitic and are responsible for several significant human infections. Their food is digested inside food vacuoles, and freshwater protozoans have "contractile" vacuoles for the elimination of water.

The protozoans we will study can be placed in four groups according to their type of locomotor organelle:

phylum Sarcodina	Amoeboids	Pseudopods	*Amoeba*
phylum Ciliophora	Ciliates	Cilia	*Paramecium*
phylum Zoomastigophora	Zooflagellates	Flagella	*Trypanosoma*
phylum Sporozoa	Sporozoa	No locomotion	*Plasmodium*

Phylum Sarcodina Amoeboids

Are protists that move and engulf their prey with **pseudopods.** the pseudopods surround and engulf the prey, which may be algae, bacteria, or other protozoans and digestion then occurs within a food vacuole. Example: ***Entamoeba histolytica*** is a parasite that can infect the human intestine and cause amoebic dysentery. Complications arise when this parasite invades the intestinal lining and reproduces there. If the parasites enter the body proper, liver and brain impairment can be fatal.



Ciliates

The **ciliates** such as those in the genus *Paramecium* are the most complex of the protozoans. Ciliates have two types of nuclei: a large *macronucleus* (controls the normal metabolism of the cell) and one or more small *micronuclei.* Hundreds of cilia, which beat

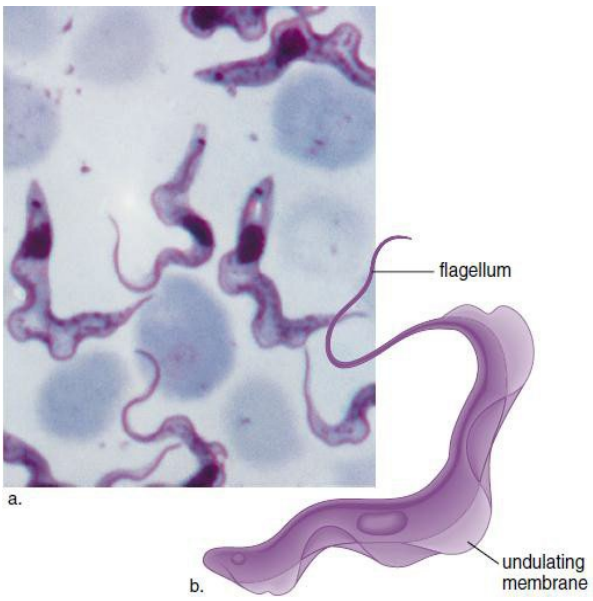
in a coordinated rhythmic manner, project through tiny holes in a semirigid outer covering, or pellicle.

When a paramecium feeds, food is swept down a gullet, below which food vacuoles form. Following digestion, the soluble nutrients are absorbed by the cytoplasm, and the indigestible residue is eliminated at the anal pore.

Zooflagellates

Protozoans that move by means of flagella are called zooflagellates.

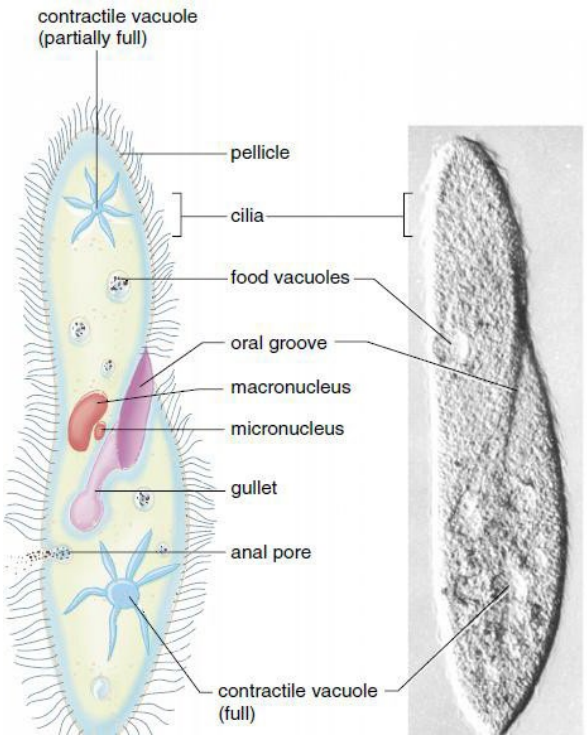
Trypanosoma brucei, transmitted by the bite of the tsetse fly, is the cause of African sleeping sickness. The white blood cells in an infected animal accumulate around the blood vessels leading to the brain and cut off circulation. The lethargy characteristic of the disease is caused by an inadequate supply of oxygen to the brain.



Sporozoa

Sporozoa are nonmotile parasites of animals. Their name recognizes that these organisms form spores at some point in their life cycle. The most widespread human parasite is ***Plasmodium vivax,*** the cause of one type of **malaria**. When a human is bitten by an

infected female ***Anopheles*** mosquito, the parasite eventually invades the red blood cells. The chills and fever of malaria appear when the infected cells burst and release toxic substances into the blood.



س: عرض تقديمي يخص احد مواضيع الوحده

الوحدة الحادية عشر - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Classify kingdom of fungi and their importance.
2-The Dangers of fungi.

موضوعات المحاضرة الاولى:

1. Kingdom of Fungi, Classification, Reproduction
2. Harmful Activities of Fungi

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• محاضرة • مناقشة • سؤال وجواب • نشاط (١/١/١١) صنف مع ذكر مثال	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الحادية عشر	الأولى	القاء المحاضرة مستخدما جهاز العرض والسبورة	٩٠ دقيقة
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/١/١١) صنف مع ذكر مثال	

المادة العلمية:

Kingdom Fungi

Fungi are multicellular eukaryotes that are heterotrophic by absorption. They send out digestive enzymes into the immediate environment, and then, when organic matter is broken down, they absorb nutrient molecules. The body of a fungus is usually a multicellular structure known as a mycelium. A mycelium is a network of filaments called hyphae (sing., hypha):

Fungal cells are quite different from plant cells not only by lacking chloroplasts but also by having a cell wall that contains *chitin* and not cellulose. Fungi produce non-flagellate spores during both sexual and asexual reproduction, which are dispersed by the wind.

Fungi Classification

Zygospore fungi	*Rhizopus*
Sac fungi	*Saccaromyces*
Club fungi	Mushrooms, shelf fungi
Coral fungi	Plant parasites

Zygospore Fungi

The zygospore fungi live off plant and animal remain in the soil and also bakery goods in our kitchens. Some, however, are parasites of small soil protists or worms, and even insects such as the housefly. In *Rhizopus stolonifer,* black bread mold, stolons are horizontal hyphae that exist on the surface of the bread; rhizoids grow into the bread, and *sporangiophores* are stalks that bear sporangia. A sporangium is a capsule that produces spores, more properly called sporangiospores. During asexual reproduction all structures involved are haploid; during sexual reproduction there is adiploid zygospore for which the phylum is named. Hyphae of opposite mating types, termed plus (_) and minus (_), grow toward each other until they touch. *Gametangia* form and merge, producing a large cell in which nuclei of the two mating types pair and then fuse. A thick wall develops around the cell, which is now called a **zygospore.** Upon germination, sporangiophores develop, and many spores are produced by meiosis. By now, you will have no trouble in identifying this cycle as a haplontic life cycle.

Sac Fungi

Sac fungi include red bread molds (e.g., *Neurospora*) and cup fungi. Also, morels and truffles are sac fungi highly prized as gourmet delicacies. A large number of sac fungi are parasitic on plants; powdery mildews grow on leaves, as do leaf curl fungi; chestnut blight and Dutch elm disease destroy the trees named. Ergot is a parasitic sac fungus that infects rye and (less commonly) other grains. The division name for sac fungi, Ascomycota, refers to the **ascus,** a fingerlike sac that develops after hyphae from two mating strains merge, producing dikaryotic (each cell has two nuclei) hyphae. In an ascus, a zygote forms and undergoes meiosis to produce eight haploid nuclei that become eight ascospores. The asci are usually surrounded and protected by sterile hyphae within a **fruiting body**. Asexual reproduction, which is the norm among ascomycetes, involves the production of spores called **conidiospores**.

Club Fungi

Club fungi include shelf or bracket fungi on dead trees and mushrooms in lawns and forests. Less well known are puffballs, bird's nest fungi, and stinkhorns. These structures are all fruiting bodies that contain **basidia,** club-shaped structures that give this phylum its name. Club fungi usually reproduce sexually (Fig. 28.25). Hyphae from two different mating types meet, and cytoplasmic fusion occurs. The resulting dikaryotic mycelium periodically produces fruiting bodies, which are composed of tightly packed hyphae. The fruiting body of a mushroom has a stalk and a cap. The cap of a gilled mushroom contains radiating lamellae lined by basidia where nuclear fusion, meiosis, and spore production occur. A basidium has four projections into which cytoplasm and a haploid nucleus enter. The spores are windblown and germinate to give a haploid mycelium.

The Dangers of Fungi

Fungi are both friend and foe. Some, such as mushrooms, provide food. Other fungi produce antibiotics such as penicillin. Many others break down dead tissue and recycle organic molecules, thereby keeping Earth from being buried under tons of unusable organic debris. Yet, fungi also damage crops, buildings, and animals. Fungi cause many plant diseases that can kill plants and cause sickness and death in animals that feed on infected plants. Fungi also directly cause some human diseases.

1- Plant pathogens Fungi that cause the plant diseases called rusts are difficult to control. Rusts are successful because they are pleomorphic— each species produces many kinds of spores that can infect different hosts. The wind can spread their spores over hundreds of miles. For example, *Puccinia graminis* is a fungus that causes black stem rust in cereal grains, such as rice and wheat.

2- Human pathogens Although bacteria and viruses cause most human diseases, fungi cause their share. Most fungi are dermatophytes, that is, they invade skin, nails, and hair. Some fungal spores can be inhaled into the lungs where they can establish an infection that can spread throughout the body.

Q1: classify fungi with example.

الوحدة الحادية عشر - المحاضرة الثانيه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثانيه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define Lichens.
2- Explain fungal relationships.

موضوعات المحاضرة الثانيه:

1- Yeast and Yeast Like Fungi: Characteristic and Classification, Candida.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• عرض تقديمي • مناقشه • نشاط (١/٢/١١) عرف	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثانيه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الحادية عشر	الثانيه	عرض تقديمي يلقيه الطلبه بشكل مجاميع باحد مواضيع المحاضره	٩٠ دقيقة
		مناقشه موضوع المحاضره مع الطلبه	
		نشاط (١/٢/١١) عرف	

المادة العلمية:

Yeasts

Yeasts are unicellular sac fungi that reproduce asexually either by mitosis or by budding. When yeasts ferment, they produce ethanol and carbon dioxide. yeasts are added to relatively sterile grape juice in order to make wine. In baking, the carbon dioxide given off by yeast is the leavening agent that causes bread to rise.

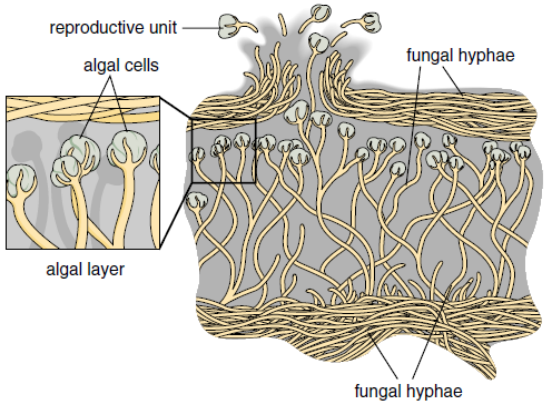
Candida

Candida albicans is a yeast like organism that causes infections of the vagina, especially in women on the birth-control pill. This organism also causes thrush, an inflammation of the mouth and throat.

Fungal Relationships

Fungi are parasites of plants and animals. **Lichens** are a symbiotic relationship between a fungus and a green alga. The body of a lichen has three layers: the fungus forms a thin, tough upper layer and a loosely packed lower layer that shield the photosynthetic cells in the middle layer.

In the past, lichens were assumed to be a relationship of mutual benefit: the fungus received nutrients from the algal cells, and the algal cells were protected from desiccation by the fungus.



Q1: Define Lichens

الوحدة الثانيه عشر - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Explain the differences between invertebrates and vertebrates.

موضوعات المحاضرة الاولى:

1- Kingdom of Animals, Classification, Invertebrates and Vertebrates, Importance to Human Diseases.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• محاضرة • مناقشة • سؤال وجواب • نشاط (١/١/١٢) مقارنه	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الثانيه عشر	الأولى	القاء المحاضرة مستخدما جهاز العرض والسبورة	٩٠ دقيقة
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/١/١٢) مقارنه	

المادة العلمية:

Kingdom Animalia

Multicellular organisms with well-developed tissues; usually motile; heterotrophic by ingestion, generally in a digestive cavity.

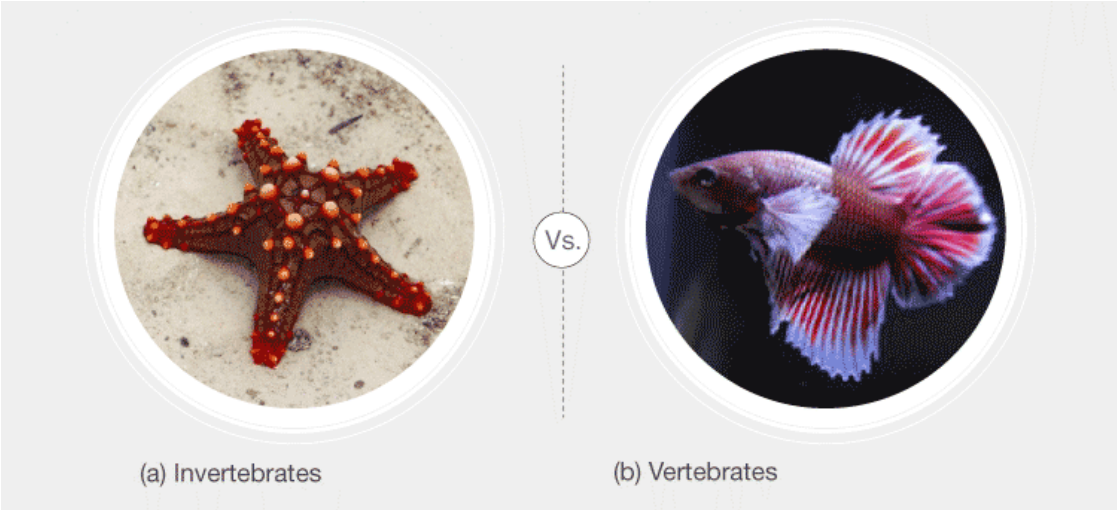
Although there are many different types of animals, they have characteristics in common:

1. Are heterotrophic and usually acquire food by ingestion followed by digestion.
2. Typically have the power of motion or locomotion by means of muscle fibers.
3. Are multicellular, and most have specialized cells that form tissues and organs.
4. Sexual reproduction and produce an embryo that undergoes developmental stages.

In the animal kingdom, animals have been classified into two main categories based on the presence or absence of the backbone:

1-Invertebrates: can be simply identified as animals that don't have a backbone.

2-Vertebrates: Members possess a well-defined internal skeleton system, which includes a backbone



Differences Between Invertebrates and Vertebrates

	Invertebrates	Vertebrates
1	Invertebrates do not possess a backbone.	Vertebrates possess a backbone and an internal skeleton.
2	Presence of an exoskeleton	Well-developed brain, Internal skeleton, and advanced nervous system.
3	Small and slower-moving animals.	Large and faster-moving animals.
4	Flatworms, arthropods, sponges, insects are few examples Invertebrates.	Mammals, fish, reptiles, amphibians, and birds are examples of Vertebrates.
5	Invertebrates do not possess a backbone.	Vertebrates possess a backbone and an internal skeleton.

Q1: Explain the differences between invertebrates and vertebrates

الوحدة الثانيه عشر - المحاضرة الثانيه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثانيه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Enumerate the types of muscles and their properties and functions.

موضوعات المحاضرة الثانيه:

1- Human Bodies, Protection, Support and Loculation.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/٢/١٢) مقارنه • فديو • سؤال وجواب	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثانيه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الثانية عشر	الثانيه	نشاط (١/٢/١٢) مقارنه	٩٠ دقيقة
		اختبار معلومات الطلبه قبل القاء المحاضره	
		عرض فديو توضيحي يخص الماده	
		الاجابه على اسئلة الطلبة	

المادة العلمية:

Protection, Support, and Locomotion

Skin: The Body's Protection

Skin, the main organ of the integumentary system, is composed of layers of the four types of body tissues: epithelial, connective, muscle, and nervous. Epithelial tissue, found in the outer layer of the skin, functions to cover surfaces of the body. Connective tissue, which consists of both tough and flexible protein fibers, serves as a sort of organic glue, holding your body together. Muscle tissues interact with hairs on the skin to respond to stimuli,

such as cold and fright. Nervous tissue helps us detect external stimuli, such as pain or pressure. The skin is a flexible and responsive organ. Skin is composed of two principal layers—the epidermis and dermis. Each layer has a unique structure and performs a different function in the body.

One function of skin is to help maintain homeostasis by regulating your internal body temperature.

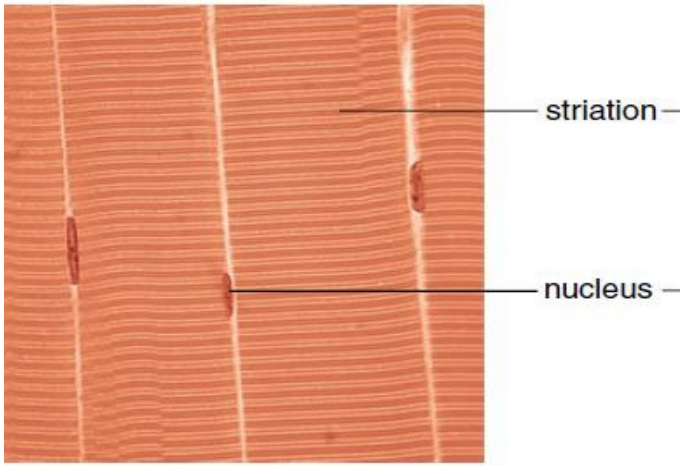
Bones: The Body's Support

The adult human skeleton contains about 206 bones. Its two main parts. The axial skeleton includes the skull and the bones that support it, such as the ribs. The appendicular skeleton includes the bones of the arms and legs and structures associated with them.

The primary function of your skeleton is to provide a framework for the tissues of your body. The skeleton also protects your internal organs, including your heart, lungs, and brain. The arrangement of the human skeleton allows for efficient body movement. Muscles that move the body need firm points of attachment to pull against so they can work effectively. The skeleton provides these attachment points. Bones also produce blood cells. **Red marrow** (found in the, femur, sternum, ribs, vertebrae, and pelvis) is the production site for red blood cells, white blood cells, and cell fragments involved in blood clotting.

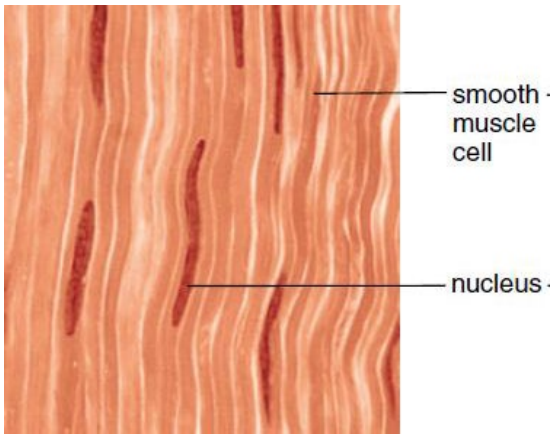
Muscles for Locomotion

Muscle fibers contain actin filaments and myosin filaments, whose interaction accounts for movement. There are three types of muscles:



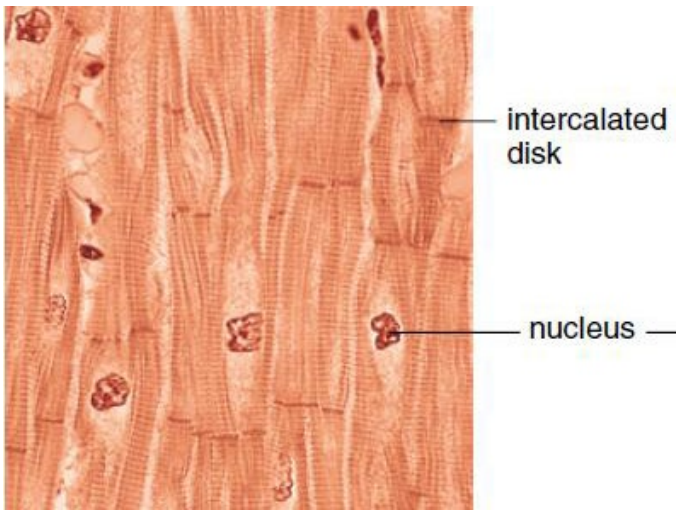
1- Skeletal muscle

- Has striated cells with multiple nuclei.
- Usually attached to skeleton.
- Functions in voluntary movement.



2- Smooth muscle

- Has spindle-shaped cells, each with a single nucleus.
- Occurs in walls of hollow internal organs.
- Functions in movement of substances in lumens of body.
- No cross striations, involuntary.



3-Cardiac muscle

- Has branching striated cells, each with a single nucleus.
- Occurs in the wall of the heart, Involuntary.
- Functions in the pumping of blood.

Q1: compare between types of muscles.

الوحدة الثانيه عشر - المحاضرة الثالثه - الزمن: ٩٠ دقيقة

أهداف المحاضرة الثالثه:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Define the following terms: (immunity, antibodies and hormones).

موضوعات المحاضرة الثالثه:

1- Human Body Defense (Immunity, Antigen, Antibody), Hormones, Enzymes.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• محاضرة • مناقشة • سؤال وجواب • نشاط (١/٣/١٢) عرف	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الثالثه

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الثانيه عشر	الثالثه	القاء المحاضرة مستخدما جهاز العرض والسبورة	٩٠ دقيقة
		طرح بعض الاسئلة خلال القاء المحاضرة	
		نشاط (١/٣/١٢) عرف	

المادة العلمية:

Immunity

The term immunity refers to the general ability of a host to resist a particular infection or disease. There are two different types of immune responses:

1- The **nonspecific immune response** is also known as **innate** or **natural immunity:** it resists any microorganism or foreign material encountered by the vertebrate host. It includes general mechanisms inherited as part of the innate structure and function of each person (such as skin, mucus and acts as a first line of defense. The nonspecific immune response lacks immunological memory and nonspecific responses occur to the same extent

each time a microorganism or foreign body is encountered.
2-The **specific immune responses,** also known as **acquired, adaptive immunity:** resist a particular foreign agent. The effectiveness of specific immune responses increases on repeated exposure to foreign agents such as viruses, bacteria, or toxins; that is to say, specific responses have "memory."
Substances that are recognized as foreign and provoke immune responses are called **antigens.** The antigens cause specific cells to replicate and manufacture a variety of proteins that function to protect the host. One such cell, the B cell, produces and secretes glycoproteins called antibodies. **Antibodies** bind to specific antigens and inactivate them or contribute to their elimination.

Q1: Define immunity and mentions its types.

الوحدة الثالثة عشر- المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1-Describe the flat worms and mention its types.
2-Describe the round worms.

موضوعات المحاضرة الاولى:

1- Helminths: Characteristics and Classification.
2- Flat Worms, Round Worms, Classification.
3- Harm full Activities to Human.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• سؤال وجواب • محاضره • نشاط (١/١/١٣) وضح	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الثالثه عشر	الأولى	طرح واجابه الاسئلة قبل القاء المحاضره	٩٠ دقيقة
		القاء المحاضره باستخدام جهاز التلفاز	
		نشاط (١/١/١٣) وضح	

المادة العلمية:

Classification of kingdom Animalia:

Phylum	Examples
Platyhelminthes (flatworms)	Planarians, flukes, tapeworms
Nematoda (roundworms)	Pinworms, hook worms

Phylum Platyhelminthes- Flatworms

Flatworms have three germ layers. The presence of mesoderm in addition to ectoderm and endoderm gives bulk to the animal and leads to greater complexity. Free-living flatworms have muscles and excretory, reproductive, and digestive organs. Parasitic flatworms lack respiratory and circulatory organs, because the body is flat and thin, diffusion alone is adequate for the passage of oxygen and other substances from cell to cell.

A- Free-living flatworms - Planarians

1- Planarians live in fresh water and have an excretory organ that serves primarily to rid the body of excess water.

2- The beating of cilia in the *flame cells* keeps the water moving toward the excretory pores.

3- The digestive tract is incomplete because it has only one opening.

4- Planarians are **hermaphrodites;** they possess both male and female sex organs.

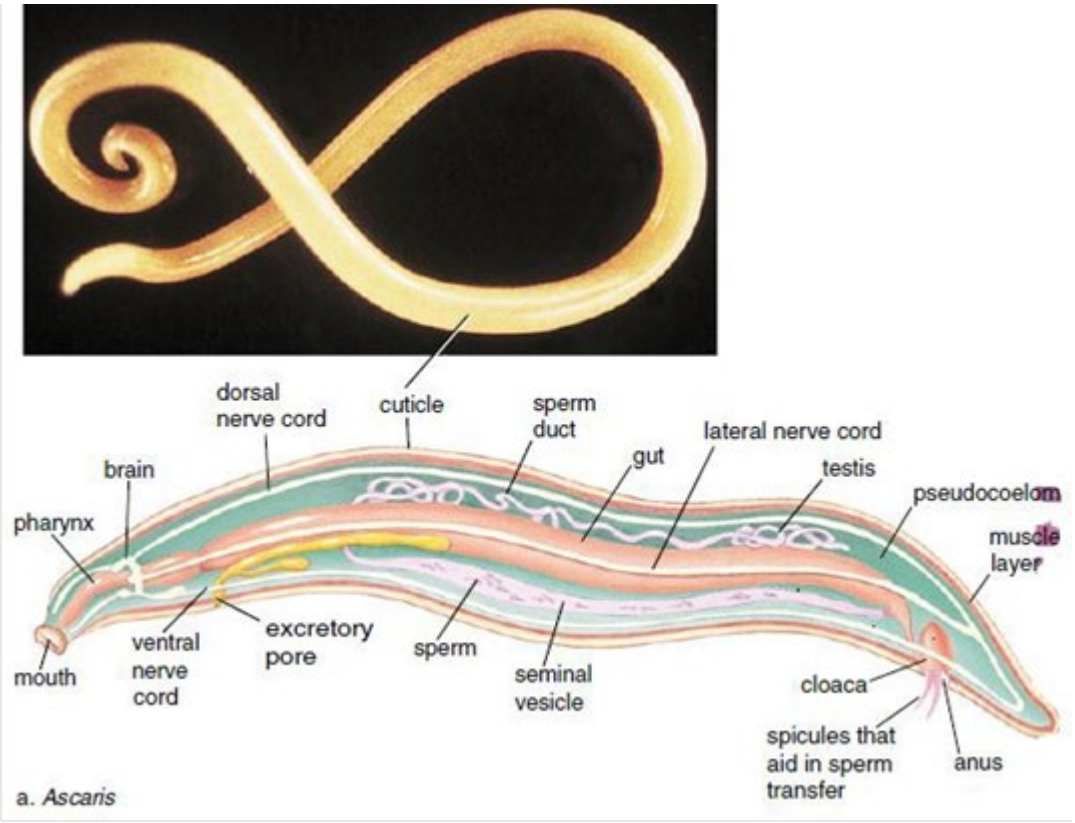
B- Parasitic Flatworms Flukes and Tapeworms

Flukes and tapeworms are two classes of parasitic flatworms. The anterior end of these

animals carries suckers and sometimes hooks for attachment to the host. The parasite absorbs nutrients from the digestive tract of the host, and in tapeworms the digestive system is essentially absent. The tegument, a specialized body wall resistant to host digestive juices.

The extensive development of the reproductive system, with the production of millions of eggs, may be associated with difficulties in dispersing offspring.

Both parasites utilize a secondary host to transport an intermediate stage. The primary host is infected with the sexually mature adult; the secondary host contains the larval stage or stages. Both flukes and tapeworms cause serious illnesses in human.



Phylum Nematoda- Roundworms

Are non-segmented they have a smooth outside body wall. These worms, which are generally colorless and less than 5 cm in length, occur almost anywhere in the sea, in fresh water, and in the soil.

Roundworms possess two anatomical features not seen before:

1- A tube within a tube body plan: the digestive tract is complete; there is both a mouth and an anus.

2- The body cavity is a pseudocoelom, or a body cavity incompletely. The fluid-filled pseudocoelom provides space for the development of organs.

Ascaris

In the roundworm ***Ascaris lumbricoides***, females tend to be larger than males. Both sexes move by means of a characteristic whip-like motion because only longitudinal muscles and no circular muscles lie next to the body wall.

Q1: Mention the anatomical features of round worms.

الوحدة الرابعة عشر - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Explain the relationship between organism in ecosystem.

موضوعات المحاضرة الاولى:

1- Ecosystem.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• نشاط (١/١/١٤) وضح • محاضره • فديو	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الرابعة عشر	الأولى	نشاط (١/١/١٤) وضح	٩٠ دقيقة
		اختبار معلومات الطلبة قبل القاء المحاضره	
		القاء المحاضره باستخدام جهاز التلفاز مع عرض فديو في نهايه المحاضره	

المادة العلمية:

Ecosystem

An ecosystem: is a community of living organisms in conjunction with the nonliving components of their environment interacting as a system.

- The nonliving parts of an organism's environment are the **abiotic factors**. Examples of abiotic factors include air currents, temperature, moisture, light, and soil.
- All the living organisms that inhabit an environment are called **biotic** factors**.** Examples of biotic factors include plants, animals and microbes.

There are two major kinds of ecosystems:

1- **Terrestrial ecosystems**: are those located on land. Examples include forests, meadows, and rotting logs.

2- **Aquatic ecosystems**: occur in both fresh and saltwater. Freshwater ecosystems include ponds, lakes, and streams. While saltwater ecosystems, also called marine ecosystems, make up approximately 70 percent of Earth's surface.

The Relationship Between Organism in Ecosystem

1- **Predation**: is when one organism eats another organism to obtain nutrients. Examples of predation are owls that eat mice.

2- **Competition**: is when individuals or populations compete for the same resource and can occur within or between species. An example is lions and hyenas that compete for prey.

3- **Commensalism**: is a relationship in which one organism benefits while the other is neither helped nor harmed. Examples are barnacles that grow on whales.

4- **Parasitism**: is a relationship in which one organism benefits and the other organism is harmed, but not always killed. Such as intestinal worms that live inside the host.
5- **Mutualism**: is a relationship in which both species benefit. An example is ants and aphids.

Q1: Explain the relationship between organism in ecosystem

الوحدة الخامسة عشر - المحاضرة الأولى - الزمن: ٩٠ دقيقة

أهداف المحاضرة الاولى:

يتوقع في نهاية الجلسة أن يكون الطالب قادراً على:

1- Explain the scientific methods.

موضوعات المحاضرة الاولى:

1- Scientific methods.

الأساليب والأنشطة والوسائل التعليمية

م	الأساليب والأنشطة التدريبية	الوسائل التدريبية
١	• فديو • تبادل الادوار • سؤال وجواب • نشاط (١/١/١٥) وضح	• جهاز حاسوب • جهاز عرض • سبورة • اوراق واقلام

خطة إجراءات تنفيذ المحاضرة الاولى

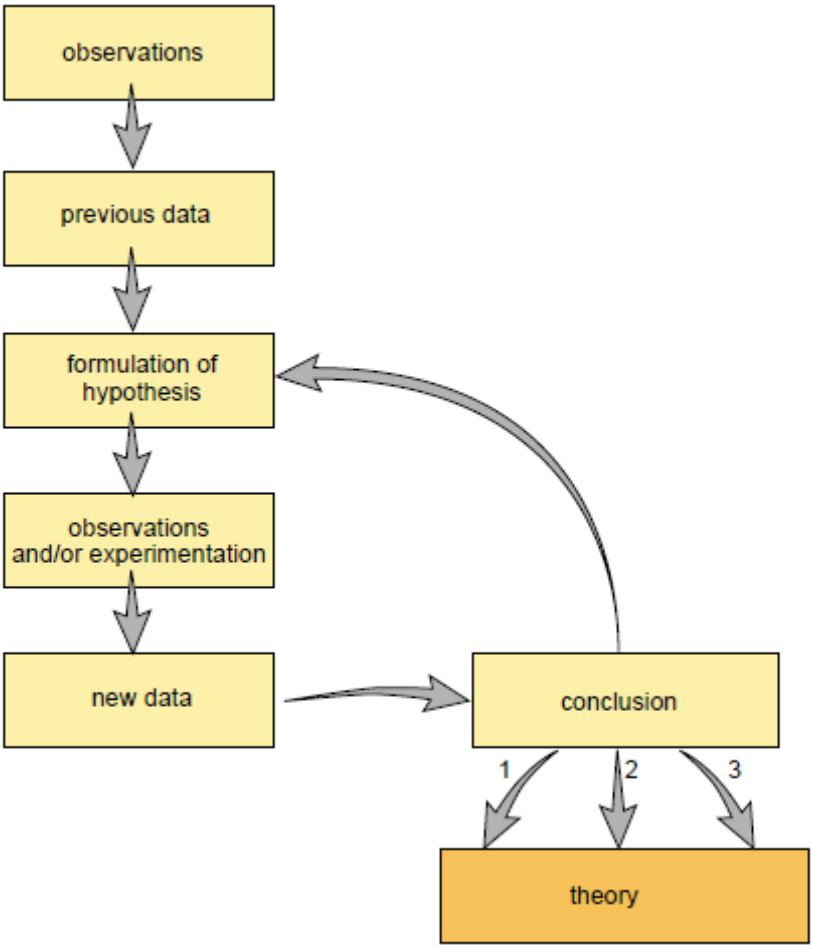
الوحدة	المحاضرة	الإجراءات	الزمن بالدقيقة
الخامسة عشر	الأولى	عرض فديو توضيحي لموضوع المحاضره	٩٠ دقيقة
		السماح للطلبه بالقاء المحاضره مع الاجابه على استفساراتهم	
		نشاط (١/١/١٥) وضح	

المادة العلمية:

The Scientific Method

Scientific methods are used by scientists to answer questions and solve problems. The development of the cell theory, one of the most useful theories in biological science, illustrates how the methods of science work. In 1665, Robert Hooke first observed cells in cork.

1- Observing: The first step toward scientific discovery often takes place when a scientist observes something no one has noticed before. After Hooke's discovery, other scientists observed cells in a variety of organisms.
2- Making a hypothesis: A hypothesis is a testable explanation or answer to a question. In 1824, René Dutrochet hypothesized that cells are the basic unit of life.
3- Collecting data: Data can support or disprove a hypothesis. Over the years, scientists who used microscopes to examine organisms found that cells are always present.
4- Publishing results: Results of an investigation are useful only if they are made available to other scientists for a peer review. Many scientists published their observations of cells in the scientific literature. Scientists will analyze the procedure, examine the evidence, identify faulty reasoning, point out statements that go beyond the evidence, and suggest alternative explanations for the same observations.
5- Forming a theory: A theory is a hypothesis that is supported by a large body of scientific evidence. By 1839, many scientific observations supported the hypothesis that cells are fundamental to life. The hypothesis became a theory.
6- Developing new hypotheses: A new theory may prompt scientists to ask new questions or form additional hypotheses. In 1833, Robert Brown hypothesized that the nucleus is an important control center of the cell.



Q1: explain the meaning of scientific methods.