ZIAUDDIN UNIVERSITY
EXAMINATION BOARD

BIOLOGY
CLASS X
ASSESSMENT

Team Lead:

Umme Farwah Halai

Subject Specialist:

Saima Pervaiz

Reviewer:

Muhammad Waseem Ahmed

Disclaimer

The web based resources are reference materials for teachers. They have been compiled under the supervision of the Ziauddin College of Education for Ziauddin's Examination Board.

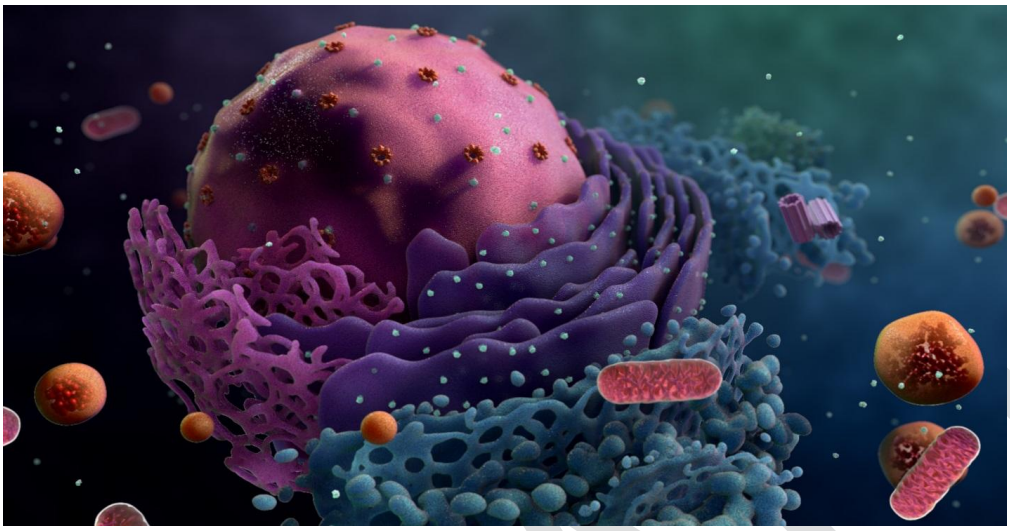
GRADE 10

Sections	Chapters	Weightage in Evaluation
Section 1 Biodiversity	Biodiversity	03 %
Section 2 Cell Biology	Enzymes Bioenergetics	12 %
Section 3 Life Processes	Homeostasis Coordination Support and Movement	20 %
Section 4 Continuity in Life	Inheritance	14 %
Section 5 Application of Biology	Biotechnology Pharmacology	08 %

SECTION 1 : BIODIVERSITY

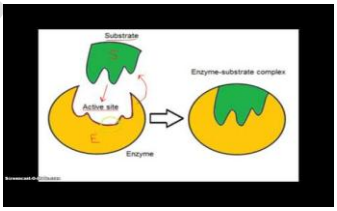
	SUB TOPICS	STUDENT LEARNING OUTCOMES	REFERENCE MATERIAL
CHAPTER 3	Definition and Introduction of Biodiversity Aims and Principles of Classification History of Classification Systems Five-Kingdom Classification System Conservation of Biodiversity	UNDERSTSANDING Define biodiversity. Describe the basis of classification of living organisms. Explain the aims and principles of classification, keeping in view its historical background. Explain the basis for establishing 5 kingdoms. Describe the major variety of life on the planet earth. Define the concept of conservation. Explain the impact of human beings on biodiversity. Identify causes of deforestation and its effects on biodiversity. Describe some of the issues of conservation in Pakistan (especially with regard to deforestation and hunting). SKILLS Examine some living or preserved plants and animals. Classify representative animals and plants into their respective kingdoms, using data.	   
Content Overview Refer the chapter of 'Biodiversity' from Punjab Textbook 'https://pctb.punjab.gov.pk/system/files/Biology%209.pdf			

Cell Biology



It Includes

Chapter:Enzymes

Chapter	Skills	Understanding	Reference web material
Enzymes	Student will Identify the competitive and noncompetitive inhibitors from the given list of chemicals. List the diagnostic uses of enzymes.	Describe the structure of enzyme Explain the role and component parts of the active site of enzyme Explain the mechanism of enzyme action through induced fit model, comparing with lock and key model. Classify enzymes on the basis of the reaction catalyzed.	 What are enzymes?  Structure of an enzyme..  Lock and key theory https://www.slideshare.net/fatimasaleh94214/enzymes-2-30256325 Enzymes terminologies Slide share.

Student Assessment

1. A _____is a biocatalyst that increases the rate of the reaction without being changed.

a) Aluminum oxide

b) Silicon dioxide

c) Enzyme
d) Hydrogen peroxide

2. Enzyme increases the rate of reaction by lowering the activation energy.
a) True
b) False

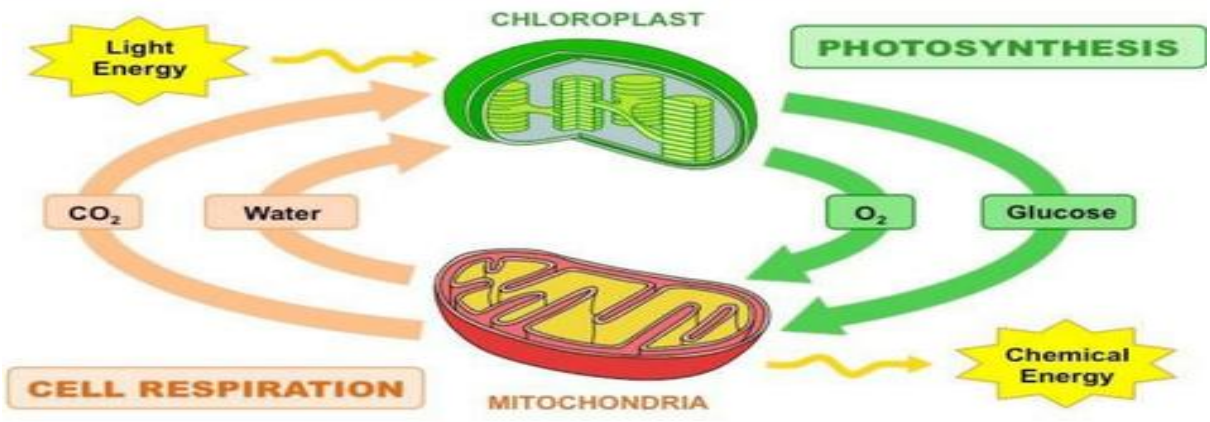
3. What is the nature of an enzyme?
a) Vitamin
b) Lipid
c) Carbohydrate
d) Protein

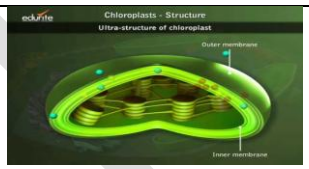
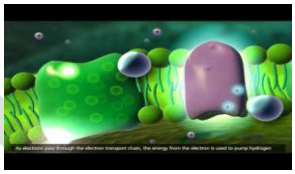
4. What is an apoenzyme?
a) It is a protein portion of an enzyme
b) It is a non-protein group
c) It is a complete, biologically active conjugated enzyme
d) It is a prosthetic group

5. Name the coenzyme of riboflavin (B2)?
a) NAD or NADP
b) FAD and FMN
c) Coenzyme A
d) Thiamine pyrophosphate

6. Name the enzyme secreted by pancreas?
a) Pepsin
b) Chymotrypsin
c) Trypsin
d) Alcohol dehydrogenase

Bioenergetics



Chapter	Skills	Understanding	Reference web material
Bioenergetics	Student will Draw the molecular structure of chlorophyll Draw the Z-Scheme for explaining the events of light-dependent reaction Develop a flow chart of explaining the events of light-independent reaction. Draw the flow chart showing the events of glycolysis and Krebs cycle.	Student will Explain the role of light in photosynthesis Identify two general kinds of photosynthetic pigments. Describe the arrangement of photosynthetic pigments in the form of photosystem I and II. Explain the calvin cycle. Describe the events of non-cyclic and cyclic photophosphorylation	 Chloroplast  Photosynthesis with its cycles  Cellular Respiration  C3, C4 and CAM plants

SECTION 3 : LIFE PROCESSES

HOMEOSTASIS

SUPPORT AND MOVEMENT

NERVOUS COORDINATION

Theme	Chapter	SLOs
SECTION 3: LIFE PROCESSES	COORDINATION	UNDERSTSANDING *Student will:* Explain what coordination means. Identify the two main types of coordination in living org Hormonal (chemical). Differentiate between the modes of coordination i.e., electr chemical in case of hormonal. Identify the main organs responsible for coordination and cor State that receptors receive stimuli and transmit information Label the diagram of human brain. Explain the function of these parts of brain; cerebrum, c thalamus, hypothalamus, medulla oblongata. Differentiate between the cross sectional views of brain and to white and grey matter. Define neuron and describe the structure of a general neuron Define reflex action and reflex arc. Name the three types of neuron involved in reflex action. Trace the path of a nervous impulse in case of a reflex action. Describe the structure of human auditory and visual receptor Describe the pupil reflex in dim and bright light. State how short and long sightedness can be treated.

		Associate the role of Vitamin A with vision and effects of its d Explain the role of ear and eye in maintenance of homeo accommodation. Relate the contribution of Ibn-al-Haitham and Al-Ibn-Isa structure of eye and treatment of various ophthalmic disease Define the terms; hormone and endocrine system. Outline the parts of endocrine system; major glands of this Pancreas, Adrenal, Gonads) and names of their respective ho Describe the term "Negative feedback" with reference to Insu Explain how adrenaline may be involved in exercise and em gained knowledge to apply to different hormones. SKILLS *Student will:* Compare the two types of coordination in tabular form. Record the difference in quickness of response of the two asking a student to say a few words in front of the class heartbeat). Analyze why plants (like sunflower) have a very slow response Visualize nervous and hormonal coordination by comparin wires with the transmission of nerve impulse in neurons an currents in liquids to the hormonal transmission in blood. Perform an experiment in which a scale held at its lower en index finger is allowed to fall and then recording the time take Identify different parts and draw a labeled diagram of the lon of sheep or bull. Perform an experiment in which the shin muscle of a frog is dish filled with methylene blue and using 12 V DC current. Check the vision of a friend to diagnose whether he/she shortsightedness.

		Perform an experiment in which one student flashes a spotli and record the time taken for the eye to contract its pupil. Compare the BGC (blood glucose concentration) of healt suffering from Diabetes mellitus. *(Data/ graph to be given in*

OVERVIEW OF THE CHAPTER:

For proper functioning of the body of organisms, it is therefore, necessary that various organ and system w their exact type of job and also should not overdo or under do their jobs. When more than one organ is associ organs should operate in a sequence for the successful accomplishment of that particular function. All these a be achieved when the body works as one unit, in which its different organs and systems cooperate and work i i.e. its diverse functions are coordinated. Their coordination can ensure the profitable existence of the organism produced by the two systems;nervous system and the endocrine system. Both control systems include: rece the coordination centre, such as the brain, spinal cord or pancreas, which receives and processes information body and the effectors that bring about responses,

The nervous system enables humans to react to their surroundings and to coordinate their behaviour. It comprises c peripheral nervous systemthat consists of millions of neurons and uses electrical impulses to communicate very quic neurons; sensory, relay and motor. Different types of neurons work together in a single reflex action, an automatic and which minimizes any damage to the body from potentially harmful conditions, such as touching something hot.The pa reflex arc.

The central nervous system (CNS) is the part of the nervous system consisting of the brain and spinal cord. The CNS is s the received information and coordinates and influences the activity of all parts of the bodies. The CNS is composed of v also be seen macroscopically on tissues of brain and spinal cord.

The endocrine system consists of a series of glands that produce chemical substances known as hormones.Hormones e c bind to a receptor in order to send their signal. They are secreted into the bloodstream and travel throughout the body, a receptors for them. Also, hormones are slower to take effect and tend to be longer lasting.

Hormones can influence behaviour, and behaviour can sometimes influence hormone concentrations. Hormones aggression, mating, and parenting of individuals. Hormones are involved in regulating all sorts of bodily functions, and through interactions between the hypothalamus (in the central nervous system) and the pituitary gland (in the end hormones are related to a number of disorders.

REFERENCE MATERIAL:

SINDH TEXT BOOK BOARD (STBB) FOR IX-X

AVAILABLE RESOURCES ON INTERNET:

http://www.gcestudybuddy.com/5-google-conversation-element/coordination-and-response

http://www.gcestudybuddy.com/5-google-conversation-element/human-eye

https://www.bbc.co.uk/bitesize/guides/z2nkv9q/revision/1

https://www.eimacs.com/gogsatstatics/download/sense%20organs%20the%20eye.pdf

https://www.asu.edu/courses/pgs461/Reflexes%20Arcs_PGS%20461.pdf

http://www.biologydiscussion.com/chemical-coordination/chemical-co-ordination-and-regulation-of-human-e

https://owlcation.com/stem/How-does-the-ear-help-to-balance-the-body

TEACHER RESOURCE:

LESSON PLANS / NOTES:

http://www.mediafire.com/file/pa05kbxqcoy2q85/Topic_11-_Coordination_and_Response.pdf/file

https://www.jagranjosh.com/general-knowledge/control-and-coordination-in-humans-1459848431-1

https://www.excellup.com/classten/scienceten/controlcoordination.aspx

https://www.it.iitb.ac.in/~vijaya/oscarteam/dokuwiki/media/chemical_coordination_in_animals.pdf

https://www.gneet.com/aipmt_jee_notes/Chemical%20co-ordination%20and%20integration.pdf

https://www.britannica.com/science/ear/Transmission-of-sound-waves-through-the-outer-and-middle-ear

https://biodifferences.com/difference-between-myopia-short-sightedness-and-hyperopia-long-sightedness.htr

https://www.soinc.org/sites/default/files/uploaded_files/3-17_NERVOUS_HANDOUT.pdf

https://sharemylesson.com/teaching-resource/nervous-system-152742

https://sharemylesson.com/teaching-resource/nervous-system-174578

VIDEO:

Human Nervous System

https://www.youtube.com/watch?v=oHgg4S9xIiA

Anatomy and Physiology of Human Brain

https://www.youtube.com/watch?v=HieUJTLaOZY

https://www.youtube.com/watch?v=kMKc8nfPATI (Bozeman Science)

Endocrine Glands

https://www.khanacademy.org/science/high-school-biology/hs-human-body-systems/hs-the-nervous-and-end the-endocrine-system

https://www.youtube.com/watch?v=gfjTBaMF8pY

Reflex Action And Reflex Arc

https://www.youtube.com/watch?v=DFuKhBI5STc

Cross sectional views of brain and spinal cord, with reference to white and grey matter.

https://www.youtube.com/watch?v=ZZQzMeFoZY0

Anatomy of eye and pupil reflex in dim and bright light.

https://www.youtube.com/watch?v=Uk0U16uZpPA

ASSESSMENT ITEMS:

https://www.khanacademy.org/test-prep/mcat/organ-systems/biological-basis-of-behavior-the-nervous-syster questions

http://highered.mheducation.com/sites/0072421975/student_view0/chapter17/multiple_choice_quiz.html

https://www.mcqlearn.com/grade10/biology/coordination-and-control-multiple-choice-questions-answers.php

Homeostasis

Theme	Chapter	SLOs
SECTION 3: LIFE PROCESSES	HOMEOSTASIS	UNDERSTSANDING Define homeostasis and describe its importance. Describe the mechanisms / adaptations in plants for the excretion / storage of CO_2, H_2O, O_2, latex, resins and gums. Explain osmotic adjustments in plants. State skin, lungs and kidneys as the major organs involved in homeostasis. Explain the role of skin in regulating body temperature. Describe how lungs keep the carbon dioxide concentration down to

		certain level. Explain that kidneys control the blood composition. Identify the different organs of urinary system. Relate the structure of kidney with its function. State that nephron is the excretory unit of kidney. Locate the different parts of nephrons and relate them with their function. State that main role of kidney in urine formation. Describe that urine formation involves three processes i.e. filtration, reabsorption and secretion. Explain that kidney plays an important role in osmoregulation. SKILLS Hypothesize why the dogs hang their tongues out and pant? Predict about the functioning of body without a kidney. Relate too much sugar intake by a diabetic with the functioning of kidney. Examine the structure of kidney (sheep kidney / model). Trace the movement of a molecule of urea from blood to urethra using a flow chart diagram.

REFERENCE MATERIAL:

SINDH TEXT BOOK BOARD (STBB) FOR IX - X

AVAILABLE RESOURCES ON INTERNET:

https://www.bbc.co.uk/bitesize/guides/z4khvcw/revision/1

http://www.gcestudybuddy.com/5-google-conversation-element/homeostasis

https://www.britannica.com/science/excretion/General-features-of-excretory-structures-and-functions

http://www.biologydiscussion.com/essay/excretion-in-animals-humans-and-plants-with-diagram/1570

https://www2.estrellamountain.edu/faculty/farabee/biobk/BioBookEXCRET.html

Support and Movement

Theme	Chapter	SLOs
SECTION 3: LIFE PROCESSES	SUPPORT AND MOVEMENT	UNDERSTSANDING *Student will:* Define skeleton and differentiate between cartilage and bone. Describe the role of skeleton in support and movement. Explain that skeleton system is actually a dynamic, living tissue that is capable of growth, adapts to stress and repairs itself after injury. Describe the main components of the axial skeleton and the appendicular skeleton. Describe the contribution of ViSalius in describing the bones and muscles in human. Differentiate between moveable joints and immovable joints. State the role of ligaments and tendons. Describe the location and movement of hinge joints. Identify ball-n-socket joints in human body. Define antagonism. Describe the action of flexors and extensors as a pair of opposing muscles selecting biceps and triceps as example. Describe the effect of by deficiency of calcium on bones and

		relate this deficiency with osteoporosis. Discuss the causes, symptoms, and treatment of arthritis. Relate the onset of arthritis with age and weight-bearing joints. SKILLS *Student will:* Identify and draw labeled diagrams of different bones of the axial and appendicular skeleton from real specimen models or charts. Describe the movement of various human joints through observation of models. Describe the movement of various human joints through observation of models. Investigate the nature of bone (by putting three pieces of rib bone of lamb in water, NaOH and dilute HCl).

ASSESSMENT ITEMS:

https://www.mcqlearn.com/grade10/biology/support-and-movement-multiple-choice-questions-answers.php

http://www.northridge.k12.oh.us/userfiles/130/Classes/235/Open%20note%20test.doc

Section04: Continuity of life

It Includes

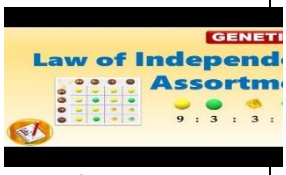
Chapter : Inheritance

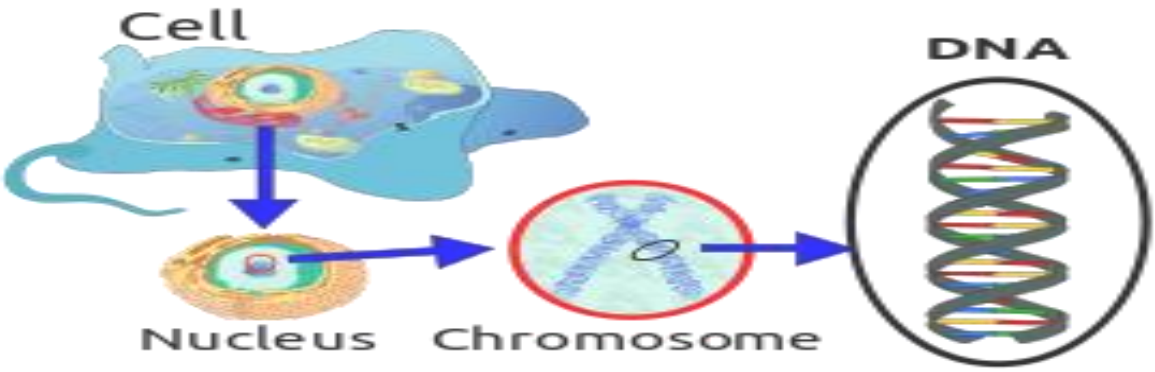
Chapter : Chromosomes and DNA

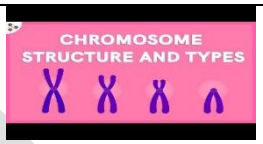
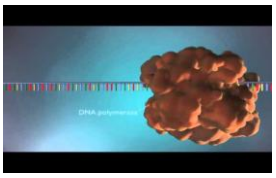
Chapter: Evolution

Chapter :Inheritance

Chromosomes and DNA

Chapter	Skills	Understanding	Reference web material
Inheritance	Student will: • Hypothesize that in a dihybrid inheritance pattern of color and texture of pea seed, the two traits are not inter dependent. • Solve at least 4 genetic problems, to illustrate the law of independent assortment. • Build a thematic chart for the blood groups of his/her class fellows and identify the antigens present in blood • Differentiate between autosomes and sex chromosomes from the karyotype	Student will: • Associate inheritance with the laws of Mendel. • Explain the law of independent assortment, using a suitable example. • Differentiate between incomplete dominance and co-dominance. • Name the various human blood group systems. • Associate multiple alleles with the ABO blood group system. • Associate the positive and negative blood groups with the presence and absence of Rh factor. • Explain the terms; polygenic and epistasis.	 Genetics  Law of independent assortment  Incomplete dominance and Codominance https://www2.palomar.edu/anthro/mendel/glossary.htm Important terminologies related to genetics



Chapter	Student learning outcomes	Understanding	Reference web material
Chromosomes and DNA	Student will: • Make a list of all the proteins that have been studied or referred to till now. • Interpret how many types of t-RNA molecules are necessary for a living cell, if the genetic code is a triplet code. • Make a list of some commonly occurring minor mutations in humans	Student will: • Describe the three models proposed about the mechanism of DNA replication. • Describe the central dogma of gene expression. • Define gene and genetic code. • Explain the mechanism of transcription • Define mutation and identify various sources of mutation. • Describe the symptoms, causes and possible available treatments of some of the gene mutations (Sickle cell anemia, Phenylketonuria)	 Chromosomes  DNA  DNA to Protein  DNA Replication
Worm up activity • *Ask following questions to the students:* ○ *What is inheritance?*			

(Expected response: Passage of traits from one generation to the other)

- *What is called as the genetic material?*

(Expected response: DNA)

- *Genes are made of?*

(Expected response: DNA)

- *Where the genes are located?*

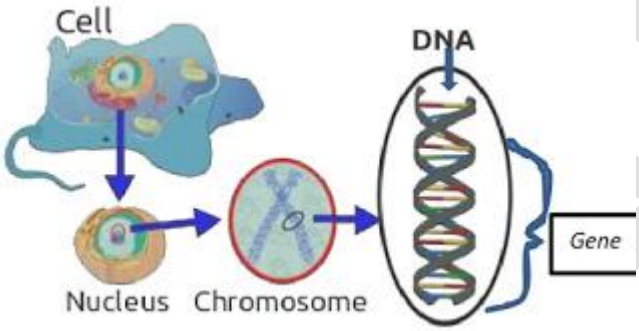
(Expected response: On Chromosomes)

- *After the students response introduce the today's topic to the class.*

Development

Activity 1

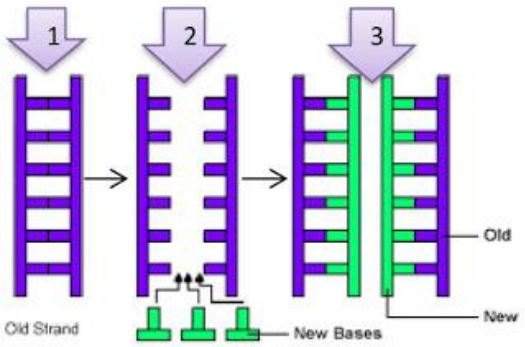
- *Show chart or model to the students and explain them the relationship among.*



Activity 2

- *Explain the process of replication of DNA to the students with the help of a chart.*

It is one of the most vital processes. It provides means by which genetic instructions can be transmitted from one (parent) cell to its two daughter cells or from one individual to its offsprings because during Replication Parent DNA duplex is able to make its two identical copies or Replica and It is now well known that DNA is the Genetic Material,able to transmit information over generations.



Replication of DNA

Sum up / Conclusion

- *Summarize the lesson as; chromosomes are thin thread like structures present in the nucleus of the cell. Chromosomes are made of DNA.*
- *Genes are the unit of inheritance which transfers characters to the next generation.*
- *DNA is capable of self-replication.*

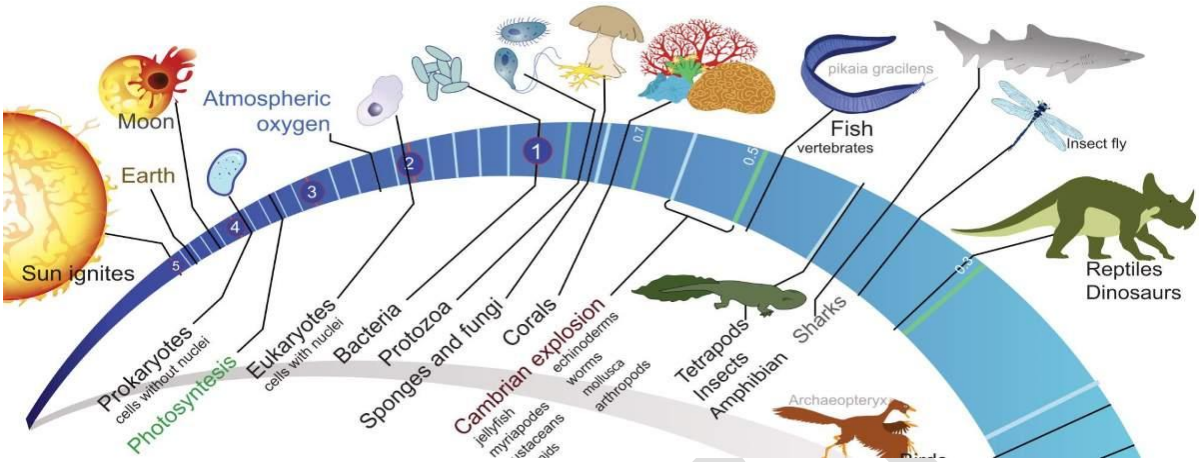
Assessment

- *Ask the following questions to assess the understanding of the students:*
  - *How the Genes and DNA are interlinked?*
  - *Where the chromosomes are located inside the cells?*
  - *Which information is stored in the genes?*
  - *What is meant by replication?*
  - *In DNA replication, what happens to the original DNA strands?*

Follow up

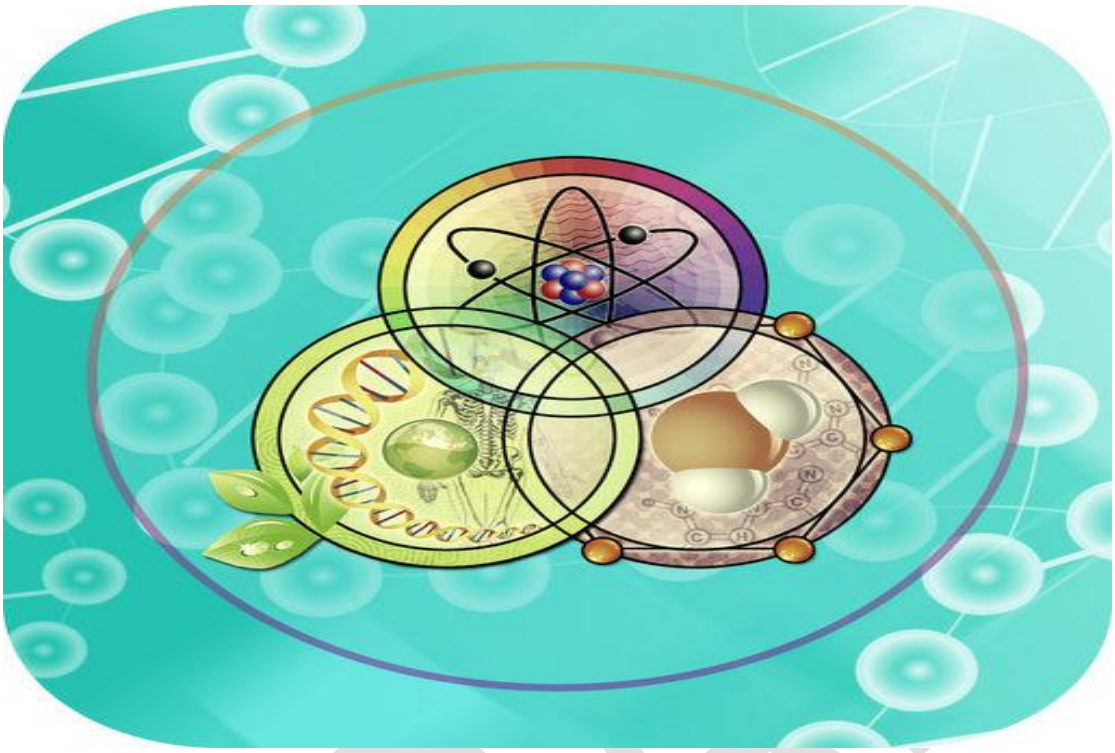
- *Ask the students to build DNA model by using cut outs of card board paper of different colors, and display the model in the class.*

Evolution



Chapter	Skills	Understanding	Reference web material
Evolution	Student will: • List the vestigial structures found in man and categorize them in homologous or analogous structures. • Describe and analyze examples of technology that have extended or modified the scientific understanding of evolution	Student will: • Justify Lamarck as an early proponent of evolution. • Describe the theory of inheritance of acquired characters, as proposed by Lamarck. • Outline the steps of the evolution of the giraffe, as illustrated in Lamarckism. • State the drawbacks in Lamarckism. • Explain the theory of natural selection as proposed by Darwin.	 Homologous and analogous organs  Darwin theory  Evidence for evolution

Application of biology



Biotechnology

Chapter	Skills	Understanding	Reference web material
Biotechnology	Student will: Describe the application of polymerase reaction. State the importance and limitation of DNA analysis.	Student will: • Describe the terms of genome analysis, genome map and genetic markers. • Explain tissue culture and differentiate between the organ culture and cell culture • State the objectives of the production of transgenic bacteria, transgenic plants and transgenic animals. • Define gene cloning and state the steps in gene cloning. • Describe the techniques of gene cloning through recombinant DNA technology	 Biotechnology  DNA cloning  DNA Replication  Tissue Culture