

# COURSE: Living Environment

## Grade Level:10

MAIN/ GENERAL TOPIC	SUB-TOPIC:	ESSENTIAL QUESTIONS:	WHAT THE STUDENTS WILL KNOW:	WHAT THE STUDENT WILL BE ABLE TO DO:	Assessments:	WHEN STUDENT DOES IT:
Nature of life	Life Characteristics Life Processes	How can you tell if something is alive?	Living things carry out metabolic processes, maintain homeostasis, and pass on hereditary information through reproduction.	Given a set of characteristics, determine if the subject is living or nonliving. Use the proper techniques for observation using a compound microscope	Teacher made test and quiz. Using Compound Microscope lab	Sept.
The Scientific Method	Experimental design Theories and Laws SI Units of Measure	How is a hypothesis different than a theory? What are SI units and why are they used worldwide? What is a controlled experiment?	Interpret the results of a controlled experiment. Describe the steps of the scientific method.	Given a problem be able to design a controlled experiment to test a hypothesis  Use proper tools for measurements	Making Connections Lab  Teacher made test and quiz.	Sept.
Bio-chemistry	Atomic theory Bonding Acid, bases, salts Biologically important compounds	What is the basic structure of an atom? Why can we say that all biology is really chemistry? What are the basic functions for carbohydrates, lipid, and proteins? How do enzymes help carry out their activities?	Atoms are the building blocks of all matter. Combinations of atoms form more complex substances that are important in biological processes.	Construct models of carbohydrates, lipids and proteins.  Model the formation and breakdown of carbohydrates, lipids and proteins from/into simpler substances.	Biological Substances Lab Teacher made test and quizzes.	Sept.
Cellular Respiration and Photosynthesis	Aerobic respiration Anerobic respiration,  Chemistry of photosynthesis	Explain why energy is important for living things?  Why are photosynthetic	All living things obtain energy for their life processes through cellular respiration.  Photosynthesis uses light energy, CO <sub>2</sub> and H <sub>2</sub> O to make glucose.	Determine the relationship between sunlight and rate of photosynthesis.  Explain how cellular respiration and photosynthesis are related.	Teacher made test and quizzes.  p.120 lab p.350 lab	October

		plants so important to life on earth?				
The Cell	Cell Structure Animal cells Plant cells	What is a cell? What is the difference between eukaryotic cells and prokaryotic cells? How are plant and animal cells different?	Basic organelles of plant and animal cells. Differentiate between plant and animal cells in form and function.	Make a wet mount slide with and without stain. Use a compound microscope to identify plant and animal cell organelles visible in a light microscope.	Onion cell lab Check cell lab Teacher made test and quizzes.	October
Taxonomy	Classification Taxonomy keys	How are living things classified?	Describe the naming system used in modern biology. Describe the types of evidence used to determine relationships between groups.	Create a taxonomy key used to classify leaves	Teacher made test and quizzes. Taxonomy Lab	Oct
Nutrition	Autotrophs and heterotrophs  Six basic human nutrients	What are the six basic nutrients and their function?	Differentiate between autotrophs and heterotrophs Describe the importance and function of the six basic human nutrients.	Model through lab activities the digestion of carbohydrates, fats, proteins. Describe how minerals like iron are added to food and their importance.	Teacher made test and quizzes.  Nutrient lab	Dec
Transport and Excretion	Blood and Immunity Circulatory Systems  Gas Exchange	How are living things adapted to absorb and circulate material? How is blood important in maintaining homeostasis? How does the body defend against disease.  How is gas exchanged in organisms?  How do humans get rid of biological wastes and toxins?	Describe how paramecium, hydra, earthworm, grasshopper transport materials and gases.  Describe the function and structure of the human circulatory system.  Describe how the human circulatory system can malfunction.  Describe how the body defends itself against disease.  Describe how the human respiratory system functions.	Determine blood type from simulated blood. Draw various blood cells from prepared blood smear.  Model how infectious disease can be spread.  Diagram the blood flow into and out of the heart.  List several circulatory and respiratory diseases and their causes.	Teacher made test and quizzes.  Blood type lab Disease spread lab  Lung Capacity lab	Dec
Support and Locomotion	Invertebrates Vertabrates	How do invertebrates, vertabrates and	Describe how unicellular, hydra, earthworms, and grasshoppers move.	Describe how single celled organisms, hydra, grasshopper, earthworms and humans have different adaptations for	Teacher made test and quizzes.	January

		unicellular organisms movement?  How do muscle and the skeleton provide for movement?	Name the major bones of the human skeleton.  Describe how movement is an evolutionary advantage.	locomotion.	Bone Lab	
Regulation	Chemical regulation and nervous regulation	How do organisms maintain homeostasis?  How do living things respond to their environment?  How do human maintain nervous regulation?  How do hormones regulate human body functions?	Describe how the nervous system and endocrine system regulate and coordinate responses to external and internal change.  Describe how the central and peripheral nervous systems function in maintaining homeostasis.  Describe how hormones regulate reproduction, growth and homeostasis.	Basic function of the central nervous system.  Describe how a reaction works.  Describe how plant hormones affect growth.  Describe how hormones affect reproduction in humans.	Teacher made test and quizzes.  Gibberlic acid lab  Reaction Lab	Jan
Plant Structure and Functions	Plant Structure Plant Function	How do xyloem and phloem function?  What are the main tissues and what are their functions?  How does a flowering plant carry out reproduction?	Plants are made up of tissues which form organs that are the roots, stems, leaves and reproductive structures.  Plant hormones control growth.  Transpiration is the loss of water from plant surfaces.	Using prepared and student prepared slide the student will generate diagrams of different plant tissue.  Describe the functions of root, stems, leaves and reproductive surfaces	Root tip lab Giberillic acid lab	Feb
Reproduction	Mitosis Meiosis Human reproduction Sexual reproduction in plants	How does a flowering plant carry out reproduction?  How do human beings carry out	Plants life cycle alternates between an diploid and haploid generation..  Male gonads, the testes, produce sperm and secrete testosterone.  Female gonads, the ovaries produce eggs and	Differentiate between mitosis and meiosis.  Describe the process of reproduction in humans from fertilization to growth of the fetus.	Mitosis Lab Meiosis Lab Teacher Made Tests and Quizzes	March?

		reproduction?  How does reproduction increase the variations in a species	secrete estrogen.  How does a zygote form and develop into a fetus.			
Genetics	Mendelian Genetics Modern Genetics Applied Genetics	How can we determine what an offspring will look like? How are genes structured? How are proteins synthesized? How can we use genetics to improve plant and animal stocks? How can biotechnology be used to benefit humans	From study of pea plants Mendel developed the laws of dominance, segregation and independent assortment. Genes are part of chromosomes. DNA code for the formation of proteins are transcribed to mRNA then put together on ribosomes with tRNA  Gene technology is used in medicine and agriculture.  Selective breeding in plants and animals can be used to enhance certain characteristics of organisms.	Describe the phenotype and genotype from a monohybrid cross. Use universal code table determine amino acids formed from a sample DNA code.	Teacher Made Tests and Quizzes  Human Inheritance Lab Protein synthesis lab	March and April
Evolution	Darwin's Theory of Evolution Modern Evolutionary Theory	What evidence is there for evolution? How did Charles Darwin explain evolution? How do we explain evolution genetically? How do new species evolve?	Fossils, comparative anatomy, embryology and biochemistry are all evidence of the change in species over time.  Mutations cause changes in the genetic code.  Organism become new species when they change enough so they can no longer interbreed.	Describe how the evidence for evolution shows that species have changed over time and evolved into different species.  Using the knowledge of genetics describe how genes play a role in evolution of species	Teacher Made Tests and Quizzes Comparative anatomy lab Fossil making lab  Beaks of Finches Lab	April and May
Ecology	Organization of the biosphere. Biomes of the earth. Human ecology	How do organisms interact with their environment? How has population growth affected the ecosystem? How is energy moved through the ecosystem?	Abiotic factors determine which organisms can live in a system and how large a population can get.  Only one species can occupy a niche at one time.  Negative effects of humans on the ecosystem are mostly due to increasing human population.	Explain the relationships between different organisms in an ecosystem by diagramming a food chain or web. Describe the effects of human actions have on the environment including acid rain, loss of habitat, loss of biodiversity, global warming, industrialization, introduction of alien species and loss of the ozone layer.	Teacher Made Tests and Quizzes  Biodiversity lab	May/ June

