Syllabus
2020 - 2021

Course Title: Biology

Room Number: H 11

Instructor: Mr. Patrick

Contact Information: **Robert.Patrick@cojowa.edu.co**

School Year: 2021 - 2022

Reteaching/ Coaching Sessions:
By student request and appointment

Office hours:
M.T.W.TH.F: 7:30 - 8am and by student/parent request and appointment

Course Description
In this course, we will explore the living world and gain a better understanding of life. We will gain this understanding through cooperative lecture, observation, project-based learning, experimentation with hands-on labs, readings, and a variety of media. This course strongly emphasizes the development of problem-solving, critical thinking, cooperative learning, and inquiry skills. Through this exploration, we will uncover a more complete understanding of ourselves and the living world around us.

In Biology, you will be expected to go above and beyond your understandings of life-science in middle school. We will work on extending our experimental research, and designing and conducting experiments which go outside of the classroom. As we complete experimental lab reports, we will strive to write these at the university level. I look forward to a great year as we complete an in-depth exploration of the science of life.

What do we teach?
Overview of Units of Study

#	UNITS OF STUDY	CONTENT AREAS AND TOPICS
	Semester 1	
1	Viruses, the characteristics of life, he scientific process,	-Examination of Viruses: Are they alive and how do you know? -The characteristics of life -The scientific process -Developing an investigation around homeostasis
2	Ecology and Human Impact	-Interactions and Interdependence of EcoEnergy flow in ecosystems -Cycles of matter and introduction to the importance of carbon -Climate and biomes -Ecosystems and Communities -Population growth

		-Limits to growth -Human population growth -Humans in the biosphere -Biodiversity -Global climate change
3	Biochemistry and Cells	-Atomic Theory and Chemical Bonding -Properties of water -Chemical Structures and functions of biological molecules of Carbohydrates, Lipids, Proteins, and Nucleic Acids -Enzymes -Cell structure as a system for life -Cell Membrane structure and function -Photosynthesis
4	Cell Division and Cancer	-Cell growth and differentiation -Regulation of the Cell Cycle and Cancer -The central dogma of biology -Mitosis
7	Genetics	-The work of Gregor Mendel -Genetics and Probability -Mutations and Genetic DIsorders -Genetic Engineering --Gene Regulation -Genetic Engineering and its applications -Human heredity -Meiosis -Human chromosomes -Human molecular genetics
8	Evolution	Wolf/Dog Evolution Darwin's and Lemarck's theories of evolution -Evolution: From Bacteria to Humans -Evolution and Plants
9	Human Anatomy and Physiology, Homeostasis, and First-Aid Exploration	-Investigation into Medical Emergencies: The Marathon Runner Epic -Overview of Human Anatomy and Physiology with a focus on the Circulatory, Respiratory, Nervous, Musculoskeletal, Digestive, Endocrine, Integumentary, Immune, and Reproductive Systems. -Cell Respiration -Exploration of these systems in relation to system interconnections, homeostasis, and first aid and CPR for medical emergencies

How do we teach it?

Active Cooperative Lecture

Experimental Laboratories (Virtual and Hands-on Labs)
Illustrative Videos
Cooperative Group Learning Projects
Text Readings and Comprehensive Notes
Formative Class Reviews

How do we assess it?

Semester 1

Category	***Percentage***
REACHES	*Reaches Grade*
Investigation into Viruses and the Characteristics of Life	*20%*
Ecology and the Case of Yellowstone	*20%*
The evolution of Life	*20%*
Biochemistry and Cellular Biology	*20%*
Science and Engineering Practices and Cross Cutting Concepts	*20%*

Formative Assessment will count as 25% of the total grade - Homework, Binder, Lab Notebook, POGILS

Standards and Objectives: Based on the Next Generation Science Standards (NGSS)

BIO.2 Homeostasis HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis. [Clarification Statement: Examples of investigations could include heart rate response to exercise, stomate response to moisture and temperature, and root development in response to water levels.] [Assessment Boundary: Assessment does not include the cellular processes involved in the feedback mechanism.]

BIO.8 DNA, RNA, Protein and Mutations HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. [Assessment Boundary: Assessment does not include identification of specific cell or tissue types, whole-body systems, specific protein structures and functions, or the biochemistry of protein synthesis.]

BIO.9 Genetics and Punnett Squares HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. [Assessment Boundary: Assessment does not include the phases of meiosis or the biochemical mechanism of specific steps in the process.]

BIO.11 Evolution Survival of the Fittest HS-LS4-2. Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. [Clarification Statement: Emphasis is on using evidence to explain the influence each of the four factors has on number of organisms, behaviors, morphology, or physiology in terms of ability to compete for limited resources and subsequent survival of individuals and adaptation of species. Examples of evidence could include mathematical models such as simple distribution graphs and proportional reasoning.] [Assessment Boundary: Assessment does not include other mechanisms of evolution, such as genetic drift, gene flow through migration, and co-evolution.]

BIO.16 Human Impact on Ecosystems HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]

BIO.15 Food Chain and Food Webs HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.[Clarification Statement: Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise.]

Resources:

Pearson Biology and Flexbook Online text and Media Platforms

Class Norms and Expectations:

In this course, you will be expected to bring your best efforts in order to be successful. Each day you should come prepared to learn. As a foundation for this class, you are expected to show respect for yourself, others, and the classroom environment. In this way, we create a safe and productive learning atmosphere. The following sections will explore expectations for the class:

Attendance and Participation:

The class will begin as soon as the bell rings, and attendance and punctuality is strictly enforced to ensure that we make the most out of our valuable class time.

Homework:

In order to be successful, you must come with your homework assignments and projects completed on time. Late homework will be awarded a maximum of 70% of the original score if it is not completed by 8 am of the school day and turned into Google Classroom or as indicated. If it is not turned within 2 weeks of the due date it will not receive credit. This policy is to ensure that we complete the work in the curriculum and can present projects in a timely way. In your binder you should include a section dedicated only for homework in order to organize your assignments.

Independent and Group Work:

We will practice both independent and group work in class. During independent work, we will often we working in a reflective mode so you will be expected to work silently and productively. If you have questions, please raise your hand and the teacher will help you while allowing others to complete their work.

Independent and Group Work:

During group work, you will be expected to work in a cooperative manner with your teammates and support one another so that we are all successful. We will build learning contracts within our groups as we approach new investigations. Your group work is expected to be of the highest quality possible, and you will be expected to give your full contributions to the team. With group projects you will be expected to turn in an individual copy for credit.

Cooperative Lecture:

There will be a lecture component to class, which will be active cooperative lectures in which you will be asked to participate. It will require you to take comprehensive, handwritten notes. We will review techniques to take notes, and you should come to class each day with a Biology binder. Each day you will be given learning objectives, which should be recorded as a header and date and organize your notes. Notes can be taken in any manner you choose, as long as they are comprehensive and complete. They will be checked regularly during binder checks, and will contribute to your binder grade.

Lab work and lab write-ups:

We will conduct several laboratory experiments this year. While some lab supplies will be provided, often your lab group will be asked to bring in lab materials. You are expected to conduct these labs in a safe and productive way according to the guidelines set in class. You will also be expected to construct CERs and lab reports based on the experimental laboratories.

Unit Exams

You will take a series of both formative and summative assessments during the semester. During the class you will have the opportunity to explore, extend, and clarify your understandings. Regular unit exams will be done in order to check up on your progress. Summative tests and projects will take place at the end of each quarter. It is important to read and take notes, study regularly, and review through Flexbook extensions of materials.

Eating and Drinking Policy:

Since we will conduct a lot of experimental labs in the classroom, there should be no food in the classroom except during designated times. Water is allowed during class, except during certain experimental labs, but must be in a closed and spill-proof metal or plastic container.

Cell Phone Policy

Cell phones will not be used during class except during certain class activities. If you feel that you might be tempted to use it during class, there will be a space in the front of the classroom They must remain away unless you inform the teacher that there is an emergency. Cell phones may be confiscated if used and a report put into administration.

Restroom Policy:

The restroom should be used during your break time between classes and should not be used during class time as per school policies. Restrooms will only be used in an emergency and you only have 2 times each quarter which you can use emergencies. If you go to the bathroom your cell phone must be placed in the class storage area.

Technology in the classroom - Computers and Google Suite:

We will be incorporating the use of computers and the Google Suite into the classroom on a regular basis so laptop computers should be brought to class each day. We will be communicating on with Google calendar and email, so the calendar and email should be checked on a daily basis In addition, we will be using Google Classroom, docs, slides, and kami to complete and submit assignments in an effort to increase collaboration and use less paper in the classroom.

It is a responsibility to use your computers in a proper way during class. This responsibility includes being on task with the assignments at hand and not using it improperly. In addition, at times when we are not using it you will be asked to put your screen at a 45 degree angle or less so that you can give focus to the less with mind and body.

Academic Integrity :

It is expected that you will show respect for academic honesty. Plagiarism will not be tolerated and references must be cited. There will be a zero-tolerance policy for cheating or plagiarism. Anyone suspected of this behavior will receive a grade of ten on the exam or project, an incident report will be filed with the school, and you may be subject to further academic discipline.

English in the Classroom

You have the opportunity to practice English in the classroom and you will be asked to help enforce this policy so that the class can improve fluency in English. If there are times when you are unable to express yourself in English, or someone does not understand a term, you can briefly use your native language to explore the idea. Remember that this is everyone's privilege at the school, and a unique benefit you have for attending school here.

Bring all you are to the class

As mentioned at the start of the course expectations, bring your best self to the class. Show yourself, others, and the classroom environment the respect deserved and you will learn and grow in great ways in this class. If you are not showing respect you may be asked to leave class which will affect your class REACHES grade and you may be given detention. However, if you show this respect you will be fully supported by the students and teacher. Bring a good and positive attitude to class to help build a supportive class environment.