CVA Biology

Class Description

Biology students start by developing an understanding of the cellular structure and the role these structures play in living cells. The students develop a fundamental understanding of the role of bio-macromolecules, their structure, and their function as related to life processes. The students then analyze how genetic information is passed to their offspring and how these mechanisms lead to variability and diversity of species.

This course has three sections: Biology A and is the first half of the course and includes Units 1– 3a. Biology B is the second half of the course and includes Units 3b–5. Biology Y is the entire course and includes Units 1– 5.

Click HERE Class Schedule which outlines the Units, Lessons, and Assessments for this course.

Click HERE for the State standards.

Class Outline

Unit 1: Ecology
In this unit, you will explore how energy and matter move through ecosystems, using coral reefs as the anchoring phenomenon. You will trace energy from sunlight through food chains, food webs, and energy pyramids, and investigate how nutrients like carbon, nitrogen, and phosphorus cycle through living and nonliving systems. You will also examine how populations grow, stabilize, and crash by analyzing graphs and real-world examples, and explore how interactions such as predation, competition, and symbiosis shape the balance of communities. From there, you will investigate how small changes — a rise in temperature, a drop in pH, or an invasive species — can send ripples through entire ecosystems, disrupting energy flow and biodiversity. By the end of the unit, you will apply your understanding by designing a realistic solution to reduce human impact on coral reefs.

Unit 2: Cells
In this unit, you will explore the chemistry of life, from the elements in your food to the molecules that build and power your cells. You will learn how the six core elements (CHNOPS) form the four macromolecules — carbohydrates, lipids, proteins, and nucleic acids — and how each one's structure determines its job inside the cell. You will also examine how enzymes speed up chemical reactions, how the cell membrane controls what enters and exits, and how photosynthesis and cellular respiration work together to store and release energy. The unit closes by connecting all of these ideas to the cell cycle — how cells grow, copy their DNA, and divide — and why precise control of that process is critical in maintaining homeostasis.

Unit 3a: Genetics
In this unit, you will explore how traits are inherited and how reproductive strategies shape genetic variation across generations. You will compare sexual and asexual reproduction, then dive into the

fundamentals of genetics — DNA, alleles, karyotypes, and meiosis — to understand how genetic information passes from parent to offspring. Using Punnett squares and pedigrees, you will apply Mendel's laws to predict the probability of traits appearing in future generations, and then expand beyond his simple model to investigate more complex inheritance patterns involving Non-Mendalian inheritance.

Unit 3b: Protein Synthesis
In this unit, you will trace the journey from DNA to visible traits, using the story of the "Blue People of Kentucky" as your guiding phenomenon. You will explore how DNA is accurately replicated, how genes are transcribed into mRNA messages, and how those messages are translated into functional proteins — understanding that even a single change in DNA can alter a protein enough to produce a noticeable effect. You will also examine mutations as a natural source of genetic variation and investigate how they can be harmless, harmful, or occasionally advantageous. The unit closes with an exploration of biotechnology, from insulin production to CRISPR, and the ethical questions these powerful tools raise about privacy, fairness, and long-term consequences.

Unit 4: Evolution
In this unit, you will explore how and why populations change over time through evolution. You will investigate natural selection alongside other forces — chance events, migration, mutation, and mate selection — to understand how traits like antibiotic resistance or tuskless elephants shift across generations, and use mathematical models to detect when evolution is occurring. From there, you will examine how these mechanisms can cause populations to diverge into entirely new species, and consider the evidence — from fossils to DNA — that connects living organisms to their ancestors.

Unit 5: Classification
In this unit, you will explore how scientists classify and make sense of life's diversity using evolutionary evidence. You will use cladograms and phylogenetic trees to determine how organisms are related — learning to look beyond appearances and rely on bone structure, genetics, and shared ancestry — and distinguish true common ancestry from convergent evolution using examples like flying squirrels and sugar gliders. From there, you will examine how modern classification systems organize all living things into a shared framework based on evolutionary relationships. The unit closes with an investigation into viruses, exploring whether they are truly "alive" and how they hijack living cells to reproduce.

CVA Work Policy

- All classwork must be completed and submitted using the links in CTLS by the DUE DATE listed on the Class Schedule.
- Work should be completed in the order it is assigned on the Class Schedule.
- All work submitted on time will be graded within 48 hours.
- Assignments not submitted by the due date will be marked missing. Missing assignments are calculated as zeros in the coursework average. When students submit missing work, the assignment will be graded and calculated into the coursework average.

The CVA term ends prior to the end of the traditional school semester. The final date work will be accepted each term is posted on the CVA website (cobbvirtualacademy.org) and the Class Schedule.

Grading

Grades for this course are calculated based on category percentages as follows:

Category	Weight
Assignments	20%
Experiments	25%
Quizzes	15%
Tests	30%
Final Exam	10%

Academic Integrity

Academic integrity is the cornerstone of learning at CVA and we take the integrity and authenticity of student work very seriously. When academic integrity is maintained, students will make decisions based on values that will prepare them to be productive, meaningful, and ethical citizens.

Students are required to abide by the CVA Academic Integrity Policy. Academic dishonesty in any form will not be tolerated. The CVA Academic Integrity Policy outlines the consequences if students fail to maintain academic integrity in their course. For additional information, the CVA Academic Integrity Policy is posted on the CVA website.

Academic Integrity Process

Consequences	1st	2nd	3rd	4th
Parent contact by teacher	✓	✓	✓	✓
Resubmit work for full credit	✓			
Resubmit work for half credit		✓		
Automatic zero			✓	✓
Parent contact by CVA administration			✓	✓
Notification by CVA administration to local school			✓	✓
Mandated proctored exam or coursework				✓
Other as designated by CVA or local school administration	✓	✓	✓	✓

General Information

- The Cobb Teaching and Learning System (CTLS) is the platform used to deliver Cobb Virtual Academy classes.
- Students must earn 100% on the Student Orientation Quiz located inside each CVA Digital Classroom before they begin their Student Coursework.
- All coursework must be submitted through CTLS.
- All CCSD students have access to Microsoft 365 applications and must submit assignments in the requested format.
- Students in all sections of this course will take an online final exam during the window of time published on the CVA website and the Class Schedule.

Course Specific Information

There is no required textbook for this course. All content is digital and available in the online course.

Technology Requirements

CTLS is geo-restricted to the United States.

- A modern PC or Mac Computer
  - Lightweight or mobile devices such as Chromebooks, iPads, Android tablets, or smartphones **may not** be compatible with many of our courses.
  - Windows or Mac based computer
- Access to Microsoft 365
- Internet access

CVA Expectations

Student

- Maintain consistent access to a computer and internet
- Login to the course daily and review the announcements
- Adhere to the deadlines listed on the Class Schedule
- Read and promptly respond to teacher communication
- Contact the teacher with questions
- Manage your time wisely

Teacher

- Welcome Phone Call in the first two weeks
- 24-hour turnaround on all communication
- 24 – 48-hour turnaround on grading for items submitted by the due date
- Provide relevant feedback on assignments
- Be accessible via email and phone or text during published hours
- Provide two or more live sessions per term

CTLS Parent Account

Cobb Virtual Academy teachers use CTLS Parent to communicate with students and parents. Students will automatically receive communication sent from CTLS Parent via their CCSD student email address and will be asked to provide a cell phone number to receive text communications. Directions for students to set up CTLS Parent are located in the CVA Orientation. Parents will receive communications according to their existing notification settings.

Student Support

A student's first source for support is their CVA teacher. However, additional support is available. The **CVA Learning Center** is staffed with facilitators and is available both **in person** and **virtually**.

Facilitators can assist students with getting started, class navigation, assignment instructions, submitting work, technical issues, and strategies for online success.

The in-person Learning Center is on the Cobb Horizon High School campus at 1765 The Exchange Atlanta, GA.

All CVA students are enrolled in the Student Support digital classroom which provides access to the Virtual Learning Center (VLC). Students use the CTLS chat feature to send a message to the Student Support Team during the hours it is open.

Live Sessions

Your teacher will post live session information to the Class Board.