CVA Physics

Class Description

The Physics Georgia Standards of Excellence are designed to continue the student investigations of the physical sciences that began in grades K-8, and provide students the necessary skills to be proficient in physics. These standards include more abstract concepts such as nuclear decay processes, interactions of matter and energy, velocity, acceleration, force, energy, momentum, properties and interactions of matter, electromagnetic and mechanical waves, and electricity, magnetism and their interactions. Students investigate physics concepts through experiences in laboratories and field work using the science and engineering practices of asking questions and defining problems, developing and using models, planning and carrying out investigations, analyzing and interpreting data, using mathematics and computational thinking, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information.

This course has three sections: Physics A and is the first half of the course and includes Units 1– 4. Physics B is the second half of the course and includes Units 5– 8. Physics Y is the entire course and includes Units 1– 8.

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

Click HERE for the State standards.

Class Outline

Unit 1: Kinematics
In this unit, you will learn how to measure and describe motion using concepts like scalars and vectors, which help you tell the difference between quantities that have direction and those that do not. You will explore the difference between speed and velocity, calculate acceleration, and use motion graphs to model real-world movement. By the end of the unit, you will be able to analyze the motion of anything from a speeding car to a cyclist in a race and then predict what will happen next!

Unit 2: Forces
In this unit, you will explore how and why objects move (or do not move) by learning about forces. You will discover the difference between balanced and unbalanced forces, and how net force determines whether an object will speed up, slow down, or change direction. You will also learn to identify different types of forces, including contact forces like friction and tension, and non-contact forces like gravity and magnetism. By the end of this unit, you will not only be able to calculate forces in newtons but also recognize them at work in your everyday life.

Unit 3: Application of Forces
In this unit, you will build on your understanding of forces from the last unit by diving into several more complex real-world applications of forces, like an airplane flying. Then, you will take a second look at free-fall motion and apply that understanding to a variety of projectile-motion scenarios including vertical, horizontal, and angled launches. From there, you will explore the physics of circular motion and see how centripetal force keeps roller coasters on their tracks, satellites in orbit, and cars safely navigating curved roads. You will use Newton's universal law of gravitation to calculate the forces between planets and moons, and connect this to Newton's third law and satellite motion. Lastly, you will look at tension, normal, and spring forces in more detail to solve scenarios like elevators and bungee jumping.

Unit 4: Momentum, Impulse, and Collisions
In this unit, you will explore the physics of momentum and impulse. You will learn what each of these measures are, how to calculate them, and how to apply the impulse-momentum theorem to explain safety in sports, airbags, and car design. Lastly, you will use conservation of momentum to help predict the outcome in both elastic and inelastic collisions.

Unit 5: Work, Power, and Energy
In this unit, you will learn how energy powers motion, how work is done when forces move objects, and how power tells you how fast that work happens. You will explore mechanical energy, breaking down the difference between kinetic and potential energy, and use the work-energy theorem to connect force and motion. You will also discover how energy is conserved and how it can change forms without ever disappearing. By the end, you will be able to calculate how much energy it takes to lift, move, and accelerate the world around you.

Unit 6: Waves, Light, and Sound
In this unit, you will explore the fascinating world of waves, starting with mechanical waves like sound and water waves, which need a medium to travel. Then you will learn about electromagnetic waves, such as light, which can travel through the vacuum of space. You will dive into the properties of light, how it reflects off mirrors, bends through lenses, and creates effects like rainbows and mirages. By the end of the unit, you will understand how both mechanical and electromagnetic waves shape the way you experience the world every day.

Unit 7: Electricity and Magnetism
In this unit, you will start by exploring static electricity and look at how charges build up, and why they sometimes jump from one object to another. You will learn the three main ways charges can move: friction, conduction, and induction. Then you will look at electric potential energy and see how it powers electrical devices. Finally, you will connect electricity to magnetism, discovering how moving charges create magnetic fields and how magnets can produce electricity in return. By the end of the unit, you will not just know the science, you will be able to explain it, predict it, and even use it to solve real-world problems.

Unit 8: Modern Physics
In this unit, you will study the structure of the atom to understand what holds the nucleus together and why heavy nuclei are more unstable than lighter nuclei. You will see how the balance between the strong nuclear force and the repulsive electric forces inside the nucleus explains fission, fusion, and radioactive decay. You will also explore how conservation laws help predict the products of these reactions, and how half-lives allow you to calculate not only how radioactive materials change over time, but also how scientists can date ancient objects like fossils and rocks, to uncover the history of Earth and the universe.

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.