

Biology Syllabus

COURSE OVERVIEW



Biology is the study of life, from the smallest molecules inside a cell to the complex patterns of inheritance seen in living organisms. In the first semester of this course, students will begin by exploring what makes something alive and how scientists study the natural world. Students will then build a foundation in the chemistry of life, including atoms, molecules, water, carbon compounds, and the macromolecules that make up living things.

As the semester continues, students will study cells as the basic unit of life. They will learn how cell structures work together to support life processes, how materials move across the cell membrane, and how cells use energy to carry out their functions. Students will also examine how multicellular organisms grow, repair tissues, and maintain stability through processes such as mitosis and homeostasis.

The semester A concludes with an introduction to genetics and inheritance. Students will study DNA, chromosomes, cell division, meiosis, genetic

variation, and the patterns by which traits are passed from parents to offspring. They will use models, Punnett squares, pedigrees, and probability to explain how inherited traits can be predicted and why individuals of the same species can still show variation.

Throughout the semester, students will practice thinking and working like scientists. They will analyze evidence, use models, interpret data, construct explanations, and apply biological concepts to real-world situations. The course is aligned with high school life science standards that emphasize structure and function, inheritance and variation of traits, matter and energy in organisms, and the use of scientific practices to build usable knowledge.

Biology is the study of life and the living systems that make life possible. In the second semester of this course, you will continue exploring how living things store information, use energy, change over time, and interact with their environments. You will begin by studying DNA, genes, chromosomes, protein synthesis, mutations, and biotechnology. These topics will help you understand how genetic information affects traits and how scientists use genetic knowledge in medicine, agriculture, and research.

You will then study evolution and natural selection. In this part of the course, you will examine evidence for common ancestry, learn how populations can change over time, and explore how traits can become more or less common depending on environmental conditions. You will also study how matter and energy move through living systems. This includes food webs, cellular respiration, photosynthesis, and the carbon cycle. These processes show how organisms obtain energy, build molecules, and depend on one another.

The semester will conclude with ecology, biodiversity, and human impacts on ecosystems. You will learn how organisms interact with living and nonliving parts of their environment, how ecosystems can remain stable or change, and how biodiversity supports life on Earth. You will also consider how human activities can affect ecosystems and evaluate possible solutions for reducing those impacts. Throughout the course, you will use models, data, scientific explanations, and evidence-based reasoning to better understand the patterns and processes found in living systems.

COURSE LEARNING OUTCOMES



BIG IDEAS

- Living things have order and organization, from molecules to cells to complex organisms.
- Cells are the basic unit of life, and all living things are made of one or more cells.
- The structure of a cell helps determine what the cell can do.
- Living things need matter and energy to grow, repair, respond, and maintain life.
- Cell membranes help cells maintain balance by controlling what enters and leaves the cell.
- Organisms must maintain stable internal conditions, even when their environment changes.
- Cells divide so organisms can grow, repair damage, and reproduce.
- DNA stores the instructions that cells use to make proteins and pass traits from one generation to the next.
- Traits are inherited through genes, but variation makes individuals unique.

- Meiosis and fertilization help create genetic variation in sexually reproducing organisms.
- Patterns of inheritance can be predicted using models, probability, and evidence.
- Biology helps us understand ourselves, other living things, and the natural world around us.
- Scientific models, data, and evidence help us explain how living systems work.
- Science is not just a collection of facts. It is a way of asking questions, testing ideas, and building explanations based on evidence.
- DNA stores the instructions for life.
- Genes help determine traits by coding for proteins.
- Traits are influenced by both genes and the environment.
- Variation makes individuals in a population different from one another.
- Populations can change over time through evolution.
- Natural selection can lead to adaptation.
- Matter cycles through organisms and ecosystems.
- Energy flows through living systems.
- Photosynthesis stores energy in sugar.
- Cellular respiration releases energy cells can use.
- Organisms interact with each other and their environment.
- Ecosystems can remain stable or change over time.
- Biodiversity helps support healthy ecosystems.
- Human activities can affect biodiversity and ecosystem stability.
- Scientific evidence helps explain patterns in living systems.

SCIENTIFIC INQUIRY



This course is designed to help students use scientific inquiry to come to understand the natural world, and to learn about scientific concepts. Labs and activities are presented in a way to allow students to develop knowledge and understandings through interacting with their environment, asking questions, and seeking ways to answer those questions.

Scientific inquiry is a powerful way of understanding science content. Students learn how to ask questions and use evidence to answer them. In the process of learning the strategies of scientific inquiry, students learn to conduct an investigation and collect evidence from a variety of sources, develop an explanation from the data, and communicate and defend their conclusions.

Scientific Inquiry based learning allows students to design and perform experiments. Students should maintain an open and questioning mind to pose their own questions about objects, events, processes, and results.

Students will have the opportunity to plan and conduct their own experiments, and come to their own conclusions as they read, observe, compare, describe, infer, and draw conclusions. It is

important for students to understand that labs in this course are designed to allow the students to explore concepts and design their own experimentation. Students should not expect all labs to be like a recipe where they just follow the direction and complete the lab. Students should be engaged in the labs and use them as a means of exploring the concepts presented in the lessons.

ASSIGNMENT DESCRIPTIONS



- **Quizzes** – throughout and at the completion of each lesson, students will be given short quizzes with varying response types to assess their understanding of the concepts; these quizzes are low stakes, are primarily formative in nature, and allow for practice opportunities for the unit exams.
- **Laboratories** – Labs in this course are a combination of virtual and physical labs. Students will receive a lab kit for most of the materials required in the physical labs. Labs are designed to allow students the opportunity to explore scientific concepts through experimentation and scientific inquiry. To the extent possible, students will engage in an inquiry-based laboratory activity for each unit; assessment of lab activities will include lab reports and questions; student critical thinking and use of scientific processes will be emphasized over reporting “the right answer.” Students will pose their own questions about objects, events, processes, and results. They will plan and conduct their own experiments, and come to their own conclusions as they read, observe, compare, describe, infer, and draw conclusions. Some labs will provide students with step by step

directions, but many will allow the students to develop their own procedures based on their questions and exploration.

- **Unit Exams** – At the end of each unit students will take a unit test that will consist of a variety of questions types (multiple choice, short-answer, fill in the blank). These questions will be pulled from a questions bank and will be similar to questions seen in the lesson quizzes. Unit tests will serve as a measurement of students understanding of the concepts from the unit and their ability to apply and transfer these understandings.

PERSONALIZATION OF THE COURSE

This course provides many opportunities for students to explore and practice scientific skills and knowledge. The course is designed to enable personalization if needed. Students will need to discuss personalization options with their instructor.

LAB KIT & SUPPLIES



Students will engage in virtual and physical labs throughout the course. Students will need the following materials and logins to complete the labs.

CAROLINA LAB KIT

You will need to order your Carolina lab kit, which will be shipped directly to your home. Follow these steps to order your kit.

1. Go to <http://www.carolina.com/vouchers>.
2. Enter your shipping information and redemption code. You should have received your redemption code in your "**Welcome**" email.
3. Follow the instructions for reviewing your request and verify that the information on the website matches your school and the course for which you are enrolled.
4. Complete and submit the web form. If you have any questions please contact your instructor.

ADDITIONAL SUPPLIES

In addition to the supplies provided in the Carolina lab kit students will also need to supply additional materials to complete the physical labs in the course.

Extra Supply List

GIZMO LABS

Students will need to have an Explore Learning account for this course. Please contact your instructor for registration directions to obtain an account.

GRADING POLICY

High scores will be taken for each assignment and quiz. Students are expected to complete each assignment at Mastery level (80%) or higher.

Grades will be calculated as follows:

Scores in each category will be added together and divided by total possible points for that category and then multiplied by the weight of the category.

CATEGORY WEIGHTS

- Labs = 40%
- Unit Exams = 30%
- Quizzes = 20%
- Concept Checks = 10%

GRADE SCALE:

Percentage	Letter Grade	GPA
95 - 100	A	4.0
90 - 94.9	A-	3.7
87 - 89.9	B+	3.3
83 - 86.9	B	3.0
80 - 82.9	B-	2.7

TECHNICAL REQUIREMENTS

PREREQUISITE SKILLS

Before you begin, you should be able to:

- Complete basic operations with a word processing software.
- Complete basic operations with presentation software.
- Perform online research using various search engines.
- Communicate through email.

CONTACT TECHNICAL SUPPORT

1. Check the [technical support webpage](#) to see if your issue is listed.
2. If your technical issue is not addressed on the technical support page then fill out a [support ticket](#).

CMASAS HONOR CODE



CMASAS is a virtual community where we want all who join our school to feel valued. As a member of our community you have a responsibility to help build this type of environment by following our school's honor code. The honor code is outlined in the Parent-Student Handbook but we have provided a brief overview below.

- **Global citizenship:** Students are responsible for good behavior in our virtual hallways, just as they are in a classroom or a school hallway. Always use a computer in a way that shows consideration and respect. You are not to use obscene, profane, threatening, or disrespectful language. CMASAS expects students to adhere to the local and country laws applicable to them.
- **Act with academic integrity:** Integrity and authenticity of student work is something that we take very seriously at CMASAS. Do not cut, copy, or plagiarize internet content or the work of your online classmates.
- **Be mindful of copyrights:** Just as copying someone's writing is considered plagiarizing, so is the act of using someone else's photo, comic, joke, or quote without giving proper credit to its creator or author.
- **Be kind:** Communicate in a respectful and kind way, keeping comments and subject matter in posts appropriate.

- **Don't troll:** Avoid hijacking conversation threads for personal gain or steering conversation toward off-topic subjects or personal attacks toward another user.
- **Be sensitive to privacy:** Always limit your audience to a need-to-know basis.
- **Limit the spread of spam:** Spam is the equivalent of junk mail that clogs email inboxes and offers little professional or personal value while potentially opening up the users to hacking.
- **Use proper spelling and grammar:** Communicate with others using proper spelling and grammar. Save acronyms, web jargon, and shorthand for its prospective audience if it must be used at all.
- **Exercise self-control and open mindedness:** All students should exercise self-control, think before speaking, and look for value in the opinions of others.
- **Be respectful:** CMASAS requires that all comments made and opposing viewpoints expressed be done in nonconfrontational and respectful manner.
- **Consider consequences and protect yourself:** Think about the social consequences of any publicly accessible online community forum or other program you interact with.
- **Follow school policies:** All students must follow CMASAS school policies listed at the end of the Parent-Student Handbook.

ACADEMIC INTEGRITY

Academic integrity is founded upon and encompasses the following five values: **honesty, trust, fairness, respect, and responsibility**. Supporting and affirming these values is essential to promoting and maintaining a high level of academic integrity. Each member of the academic community must stand accountable for his or her actions. As a result, a community develops in which students learn the responsibilities of citizenship and how to contribute honorably to their professions.

The first responsibility for academic integrity lies with individual students and faculty members of this community. A violation of academic integrity is an act harmful to all other students, faculty, and the school. Deceit and misrepresentations are incompatible with the fundamental activity of this

academic institution and shall not be tolerated. Members of the CMASAS community are expected to foster in their own work the spirit of academic honesty and not to tolerate its abuse by others. This Academic Integrity Policy encompasses the duration of the student's enrollment with CMASAS.

Students are expected to practice responsible and honest behavior. Acts of academic dishonesty will not be tolerated at CMASAS and typical offenses are listed but not limited to the following:

- Copying material from other sources and claiming it as your own without citation.
- Soliciting answers from other students, online forums, or search engines.
- Intentional falsification or invention of date, citation, or other authority in an academic exercise.
- Taking someone else's work or ideas as your own, with or without their consent, by incorporating it into your work without full acknowledgment.
- Theft or alteration of materials.