

Earth Science

Syllabus

COURSE OVERVIEW

Earth is an enormous system. Studying it can be challenging which is why earth scientists rely on models and data from instruments, rocks, and fossils to understand it better. Models can be helpful in explaining the cyclic pattern of the moon, the reason for eclipses, and how seasons occur. Models can also be used to study the effect that gravity has in our solar system as well as in our galaxy. Data from instruments shed light on the scale properties of objects in our system such as the relative size of the Earth's crust and its atmosphere and the orbital radius of planets and moons. Evidence from rock layers and fossils have been heavily used to construct the geologic time scale, going all the way back to 4.6 billion years ago.

Part A of this course covered the challenges of studying the Earth because it is so big and how scientists rely on models and data from instruments, rocks, and fossils to understand it better. This segment of the course begins with the evidence we have gathered that describe past plate motions and how the Earth's surface has changed over time. It then moves into how water cycles through Earth and its atmosphere and the factors that contribute to our weather and climate. The last part of the course applies the concepts learned in previous units to the forecasting of natural hazards, the causes of global warming, and how we can minimize our impact on the environment.

COURSE PREREQUISITES

None

COURSE LENGTH

2 semesters

REQUIRED TEXT

None

COURSE LEARNING OUTCOMES

BIG IDEAS

- The scientific method provides an objective, standardized approach to conducting experiments and, in doing so, improves their results.
- Models are important in understanding the interactions between the Earth, sun, and moon.
- The objects in the galaxies of the universe and our solar system are held together by gravity.
- Scale properties of objects in the solar system can be determined using data from Earth- and space-based instruments.
- The geologic time scale is a model of Earth's history based on evidence gathered from rock layers.
- All Earth processes are the result of energy and matter cycling within and among the planet's systems.
- The resources that humans depend on are distributed unevenly around the planet because of past geologic processes.
- Our understanding of how tectonic plates have moved in the past is based on studying how fossils and rocks are distributed, how the continents are shaped, and what seafloor structures look like.
- Earth's surface has changed over time because of a combination of slow and large-scale processes and ones that are small and quick.
- Water cycles through Earth because of energy from the sun and the force of gravity.
- Air masses move and interact in a complex way to cause different types of weather conditions.
- The rotation and unequal heating of the Earth causes regional climates.
- Natural hazards can be forecasted by studying past data about them.

- Understanding previous natural hazards can help to develop technologies that lower their effects.
- Evidence of the factors leading to the causes of global warming can be analyzed.
- The impact of humans on the environment can be reduced.
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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.

ASSIGNMENT DESCRIPTIONS

- **Packets** - Science Packets are used to help students organize their learning for each unit. They provide students with graphic organizers, guided notes, and other activities to support their understanding of the concepts presented in the lessons and labs. Packets can also serve as a study tool.
- **Labs** - Labs in this course are a combination of virtual and physical labs. You 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. 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.

- **Quizzes** - Quizzes give students an opportunity to practice skills learned in a lesson and apply concepts to real world situations in preparation for the Unit Test. Students should expect to apply knowledge of concepts and labs to questions in the quizzes.
- **Unit Tests** - At the end of each unit students will take a Unit Test that will consist of a variety of question types (multiple choice, short-answer, fill in the blank). These questions will be pulled from a question bank and will be like questions seen in the 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.

LAB KITS & SUPPLIES

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

LAB KIT

You will need to order your lab kit by completing the form (link below). The kit will be shipped directly to your home and should take about 4-5 days to arrive. If you have any questions please contact your instructor.

<https://www.cmasas.org/lab-kit-request-form>

Lab Kit Inventory List (.pdf)

ADDITIONAL SUPPLIES

In addition to the supplies provided in the lab kit, students will also need to supply additional materials to complete the physical labs in the course. These are noted in a table at the beginning of each lab.

Extra Supply List

VIRTUAL ALTERNATIVES

If you are living outside the United States you will need to speak to your instructor about virtual lab alternatives. These are done through Explore Learning (Gizmos). You will need to request login information from your instructor. To login please do the following:

- Click the link provided in the lab instructions.
- Enter your teachers username. This will be provided with your login information.
- Choose your class, then select your name and select your product (Gizmos).
- Enter your password.
- You should then see a list of all the virtual labs available for your course. Each lab will list the name of the Gizmo you will need to complete for that lab assignment.

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 Tests = 30%
- Quizzes = 20%
- Packets = 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. This includes any artificial intelligence tools.

- **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. This includes any artificial intelligence tools.
- 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.