Syllabus

Virginia Earth Science Semester A

Course Overview

Virginia Earth Science Semester As the study of the structure of our planet and Earth's role in the solar system and universe. This branch of science relies on observations, historical data, and physical evidence to describe the natural processes that occur around us and in distant space. Virginia Earth Science Semester A begins with a discussion of the methods and tools that scientists use to study Earth and space science, including the scientific method, modeling, and mathematics. You'll look at theories for how the planets, solar system, and universe formed and explain the interactions between the Sun, Earth, and Moon. You'll also learn about the emergence of Earth's materials, atmosphere, and first life-forms, as well as the dating methods that help us piece together Earth's unique history.

Course Goals

By the end of this course, you will be able to do the following:

- Identify responsible and ethical practices used by Earth and space scientists.
- Apply the concepts of the scientific method to test a hypothesis.
- Effectively communicate scientific data and conclusions using models, reports, and graphs.
- Use coordinate systems to locate terrestrial and celestial objects.
- Create a model that conveys the size of the solar system and its planets.
- Build a conceptual model of how the universe may have initially formed based on evidence and dominant theories.
- Explain how the distribution of matter across the universe led to the formation of stars, galaxies, and terrestrial objects.
- Describe the Sun-Earth-Moon system.
- Compare the planets in terms of composition, structure, and behavior.
- Model how the early Earth separated into layers and how the atmosphere and oceans formed and stabilized.
- Explain how life on Earth was preserved in the fossil record.
- Apply dating methods to construct an accurate history of Earth's formation.
- Describe how each subsystem of Earth affects the other subsystems.

General Skills

To participate in this course, you should be able to do the following:

- Complete basic operations with word-processing software, such as Microsoft Word or Google Docs.
- Understand the basics of spreadsheet software, such as Microsoft Excel or Google spreadsheets, but prior computing experience is not necessary.
- Perform online research using various search engines and library databases.
- Communicate through email and participate in discussion boards.

For a complete list of general skills that are required for participation in online courses, refer to the Prerequisites section of the Student Orientation document, found at the beginning of this course.

Credit Value

Virginia Earth Science Semester A is a 0.5-credit course.

Course Materials

- computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft Excel or equivalent
- materials listed in Appendix B (Appendix C provides a detailed breakdown of these materials by activity.)

Course Pacing Guide

This course description and pacing guide is intended to help you stay on schedule with your work. Note that your course instructor may modify the schedule to meet the specific needs of your class.

Unit 1: Studying Earth and Space Science

Summary

In this unit, you'll explore some of the practices and tools used by Earth and space scientists. You'll describe the scientific method, which is effective in testing scientific claims. You'll also apply the steps of the scientific method in a hands-on experiment to test a hypothesis. Finally, you'll study how scientists communicate scientific data and conclusions with one another and with the public, and you'll learn the important roles that modeling and mathematics have in science.

Day	**Activity/***Objective*	Type
1 day: 1	**Syllabus and Student Orientation** *Review the Student Orientation and Course Syllabus at the beginning of this course.*	Course Orientation
3 days: 2–4	**Introduction to Earth and Space Science** *Identify responsible practices used by Earth and space scientists, and apply the physical tools they use.*	Lesson
3 days: 5–7	**The Scientific Method** *Describe the scientific method and explain why it is effective in testing scientific claims.*	Lesson
4 days: 8–11	**Testing Hypotheses** *Apply the concepts of the scientific method to test a hypothesis.*	Course Activity
4 days: 12–15	**Analyzing and Communicating Scientific Information** *Apply the tools used to effectively communicate scientific data and conclusions, including models, reports, and graphs.*	Lesson
5 days: 16–20	**Unit Activity and Discussion—Unit 1**	Unit Activity/ Discussion
1 day: 21	**Posttest—Unit 1**	Assessment

Unit 2: The Universe

Summary
You'll begin this unit by building a scale model that depicts the size of the solar system and the planets within it. Then you will analyze dominant theories about the formation of the universe to describe how stars, galaxies, and terrestrial objects came into being. In a related activity, you'll use coordinate systems to locate and compare celestial objects in space and terrestrial objects on Earth. You'll also create a model using real-time data to describe the oceans' tides and

learn how the patterns are linked to the Sun-Earth-Moon system. Near the end of the unit, you'll compare the planets in our solar system and explain their behavior using Kepler's and Newton's laws for planetary motion.

Day	**Activity/***Objective*	Type
4 days: 22–25	**The Hierarchy and Scale of the Universe** *Create a model that accurately conveys the organization and scale properties of the universe.*	Course Activity
4 days: 26–29	**The Formation of the Universe** *Create a conceptual model of how the universe may have initially formed from the big bang and explain the observational and experimental evidence that supports this theory.*	Lesson
3 days: 30–32	**Coordinate Systems** *Use coordinate systems to locate terrestrial and celestial objects.*	Course Activity
4 days: 33–36	**The Formation and Life Cycles of Celestial Objects** *Explain how the uneven distribution of matter across the universe after the big bang led to the formation of stars, galaxies, and terrestrial objects.*	Lesson
4 days: 37–40	**The Formation and Nature of the Solar System** *Compare objects in the solar system, including their formation and their gravitational interactions.*	Lesson
4 days: 41–44	**Tides** *Create a model for tidal motion based on scientific data and the structure of the Sun-Earth-Moon system.*	Course Activity
4 days: 45–48	**The Sun-Earth-Moon System** *Construct a model for the Sun-Earth-Moon system and use it to explain relevant phenomena.*	Lesson

Day	Activity/*Objective*	Type
4 days: 49–52	**The Planets** *Compare the planets in terms of composition, structure, and behavior and explain their behavior using Kepler's and Newton's laws for planetary motion.*	Lesson
5 days: 53–57	**Unit Activity and Discussion—Unit 2**	Unit Activity/ Discussion
1 day: 58	**Posttest—Unit 2**	Assessment

Unit 3: The Precambrian Earth

Summary
This unit begins with an activity that demonstrates how Earth's early oceans and life-forms coevolved with the atmosphere. You'll then study the emergence of the first life on Earth, how the layers of Earth formed, and how the fossil record has contributed to the historical timeline of Earth's development. You'll use a variety of dating methods to construct an accurate history of Earth, and you'll model Earth as an interaction of several subsystems (biosphere, atmosphere, hydrosphere, and geosphere) that exchange matter and energy.

Day	Activity/*Objective*	Type
4 days: 59–62	**The Formation of the Atmosphere and Oceans** *Model how Earth's atmosphere and oceans formed as the result of physical and chemical processes in the planet's interior.*	Course Activity
4 days: 63–66	**The Formation of Earth** *Model how the early Earth separated into layers and how the atmosphere and oceans formed and stabilized.*	Lesson

Day	**Activity/***Objective*	Type
4 days: 67–70	**The Coevolution of Life and Earth** *Explain how life on Earth was able to form and be preserved in the fossil record and model how the emergent biosphere affected other subsystems.*	Lesson
4 days: 71–74	**The Fossil Record** *Construct a history of the biosphere based on information from the fossil record.*	Course Activity
4 days: 75–78	**Determining Earth's History** *Apply a variety of dating methods to construct an accurate history of Earth.*	Lesson
4 days: 79–82	**Earth's Subsystems** *Model Earth as an interaction of several subsystems that exchange matter and energy.*	Lesson
5 days: 83–87	**Unit Activity and Discussion—Unit 3**	Unit Activity/ Discussion
1 day: 88	**Posttest—Unit 3**	Assessment
1 day: 89	**Semester Review**	
1 day: 90	**End-of-Semester Exam**	Assessment

Appendix A: Safety Notes and Disclaimer

Each Course Activity and Unit Activity that includes a lab or experiment component will highlight key safety guidelines using the safety icon (), which appears directly in the activity. In addition to adhering to those guidelines, you must ensure that you follow these general safety practices:

- Work slowly and safely at all times, and abide by the safety notes and icons.
- Pay attention and be alert at all times. Limit any distractions.
- Keep your hands away from your nose, eyes, mouth, and other skin. Wash your hands before and after experiments.
- If you don't understand something, ask a teacher or an adult before proceeding.
- Wear the required protective gear.
- Adult supervision is required for all activities involving an experiment or lab component.
- Do not perform experiments that have not been approved. Follow the procedures.
- Follow good housekeeping practices. Keep your work area clean.
- Abide by all disposal instructions and icons to protect yourself and our planet.
- Report any problems or complications to an adult.

Note: *Edmentum assumes no liability for personal injury, death, property damage, equipment damage, or financial loss resulting from the instruction included in this course.*

Appendix B: Course Lab Materials (Semesters A and B)

Household Materials – Basic

The italicized materials listed below are available as a convenience in the *Edmentum Virginia Earth Science Kit*

- paper or poster board (standard letter size: 8.5 inches x 11 inches)
- pen, pencil, or fine-tip marker
- scissors
- ruler with English and metric scales
- toilet paper
- paper towels
- plastic spoon
- plastic bowl
- rubber band
- aluminum foil
- string, fishing line, or dental floss (at least 2 meters or 6 feet)
- sticky notes, or paper and tape
- 2 soft rags
- squeezable water bottle with sport cap
- 2 large glass beakers, glasses, or jars (250 to 500 milliliters or 8 to 16 ounces)
- large, transparent glass or plastic container (such as a pitcher)
- small, transparent glass beaker or jar (such as a baby food jar)
- small glass or jar (250 milliliters or 6 to 8 ounces)
- measuring cup (able to measure ¼ cup)
- measuring spoons: 1 teaspoon and 1 tablespoon
- 2 one-gallon jugs or pitchers
- bucket or trash can
- water from a natural water source such as a pond, stream, or well
- tap water
- distilled water (at least 100 milliliters, or about 4 ounces)
- white vinegar (at least 100 milliliters, or about 4 ounces)
- baking soda
- dry bar of soap
- sand
- 2 rocks (at least 1.5 inches or 4 centimeters in size.)
- calculator (optional)

- *iron nail*

Household Materials – Less Common

The italicized materials listed below are available as a convenience in the *Edmentum Virginia Earth Science Kit*

- stopwatch (could be a mobile app or on a computer)
- lamp with 150-watt incandescent bulb (or access to a sunny area)
- apron
- compass used to draw circles (optional)
- paintbrush, 1 inch or less in width
- plastic paint tray liner (or a stream table)
- 2 empty plastic soda bottles (2 liters each)
- modeling clay
- copper penny (dated 1982 or older)
- wooden blocks (approximately 2 inches thick)
- 4 to 5 toy building blocks or game pieces (anything that resembles a tiny model house)

- *disposable gloves*
- *safety goggles*
- *small magnet*
- *magnetic compass*
- *2 thermometers, continuous measurement; must measure up to 120° Fahrenheit (50° Celsius)*
- *2 cups dry plaster of Paris*
- *petroleum jelly*
- *food coloring*

Specialized Science Materials

All materials listed below are available in the *Edmentum Virginia Earth Science Kit.*

- *scale with at least 0.1 gram accuracy*
- *magnifying hand lens*
- *graduated cylinder, 100 or 250 milliliters*
- *limestone chips (50 grams total)*
- *mineral kit (including apatite, calcite, fluorite, graphite, gypsum, magnetite, feldspar, microcline, pyrite, quartz, and talc)*
- *porcelain streak plate*
- *glass streak plate*
- *water quality test kit, including test strips for pH and total alkalinity, total hardness, nitrate/nitrite, nitrite-nitrogen, iron (Fe+2/Fe+3), copper (Cu+1/Cu+2), free and total chlorine*
- *4 2-ounce plastic jars* (may use clear, clean glass baby food jars)
- *a bivalve shell* (may use a "household" item to fossilize, such as a leaf or a chicken bone)
- *binoculars (optional)*

Appendix C: Lab Materials by Activity (Semester A)

The italicized materials listed below are available in the *Edmentum Virginia Earth Science Kit.*

Unit	Activity Name	Task	Equipment List
1	Course Activity: Testing Hypotheses **** Special lab materials required. (Edmentum Earth and Space Science Kit or school-provided lab materials)***	Task: Disappearing Rocks	Italicized items may be found in the *Edmentum Virginia Earth Science Kit's* bags labeled "Testing Hypotheses" and "Common Materials." • *limestone chips (50 grams total)* • *4 small plastic jars* (may use clear, clean glass baby food jars) • *scale with at least 0.1 gram accuracy* • *graduated cylinder, 100 or 250 milliliters* • *disposable gloves* • *safety goggles* • 4 sticky notes or small pieces of paper and tape • white vinegar (at least 100 milliliters) • distilled water (at least 100 milliliters) • baking soda • small spoon • 2 soft rags • pen, pencil, or fine-tip marker
2	Course Activity: Hierarchy and Scale of the Universe	Task 1: Comparing and Scaling Planet Sizes	• 4 pieces of paper or poster board (8.5 inches x 11 inches) • scissors • pencil or pen • ruler • compass used to draw circles (optional) • calculator (optional)
		Task 2: Comparing and Scaling Planet Distances	• toilet paper • pencil or pen • an object and location to represent the Sun • calculator (optional) • large working space, such as a hallway

Unit	Activity Name	Task	Equipment List
2	Course Activity: Coordinate Systems	Task 1: Terrestrial Coordinate Systems	none
		Task 2: Celestial Coordinate Systems	Italicized items may be found in the *Edmentum Virginia Earth Science Kit's* bag labeled "Common Materials." • *magnetic compass* • *binoculars (optional)*
3	Course Activity: The Formation of the Atmosphere and Oceans	Task 1: Evolution of the Atmosphere	Italicized items may be found in the *Edmentum Virginia Earth Science Kit's* bag labeled "Common Materials." • *2 thermometers to take continuous measurements for 30 minutes; must measure up to 120°Fahrenheit (50°Celsius)* • *disposable gloves* • *safety goggles* • stopwatch (could be a mobile app or on a computer) • measuring cup (able to measure ¼ cup) • measuring spoon: 1 tablespoon • small glass or jar (250 milliliters or 6 to 8 ounces) • 2 empty plastic soda bottles, 2 liters each • baking soda (1 tablespoon) • white vinegar (1/4 cup) • lamp with 150-watt incandescent bulb (or access to a sunny area) • 3 sticky notes • apron

Unit	Activity Name	Task	Equipment List
3	Course Activity: The Fossil Record	Task 1: Fossil Formation	Italicized items may be found in the *Edmentum Virginia Earth Science Kit's* bag labeled "The Fossil Record." • *dry plaster of Paris (about 2 cups)* • *petroleum jelly (enough to coat the object being fossilized)* • *a bivalve shell* (may use a "household" item to fossilize, such as a leaf or a chicken bone.) • paintbrush, 1 inch or less in width • plastic bowl • small plastic spoon • ruler with English and metric scales • tap water (about 2/3 cup) • enough modeling clay to make a 12-centimeter circle that's about 3 centimeters deep

Syllabus

Virginia Earth Science Semester B

Course Overview

Virginia Earth Science Semester B is the study of the structure of our planet and Earth's role in the solar system and universe. This branch of science relies on observations, historical data, and physical evidence to describe the natural processes that occur around us and in distant space. You'll begin Virginia Earth Science Semester B by comparing the composition of rocks and minerals and analyzing the processes involved in the rock cycle. You'll explore the tectonic mechanisms that lead to some of Earth's most prominent geological features. Next, you'll study important interactions between the hydrosphere and atmosphere and the role they play in weathering and erosion. You'll also differentiate between weather and climate and make evidence-based predictions about both using data and modeling. The last unit in this course highlights the negative effects that humans can have on the natural cycles of Earth, as well as effective measures we can take to protect our planet.

Course Goals

By the end of this course, you will be able to do the following:

- Compare rocks and minerals and explain their properties and characteristics.
- Model Earth's surface as a system of moving plates to explain the phenomena of continental drift and seafloor spreading.
- Analyze the history of a region using topographic maps and satellite photos.
- Demonstrate how the processes of weathering and erosion can affect human environments.
- Explain how the atmosphere interacts with other subsystems of Earth.
- Make predictions about future weather phenomena based on observations of current conditions.
- Analyze the factors that drive Earth's climate.
- Study the discovery, extraction, uses, and disposal of natural resources.
- Explain the effect of natural disasters on human populations.
- Describe the causes of pollution in Earth's fluid subsystems.
- Use models and mathematics to forecast the effects of climate change on Earth's ecosystems.

General Skills

To participate in this course, you should be able to do the following:

- Complete basic operations with word-processing software, such as Microsoft Word or Google Docs.
- Understand the basics of spreadsheet software, such as Microsoft Excel or Google spreadsheets, but prior computing experience is not necessary.
- Perform online research using various search engines and library databases.
- Communicate through email and participate in discussion boards.

For a complete list of general skills that are required for participation in online courses, refer to the Prerequisites section of the Student Orientation document, found at the beginning of this course.

Credit Value

Virginia Earth Science Semester B is a 0.5-credit course.

Course Materials

- computer with Internet connection and speakers or headphones
- Microsoft Word or equivalent
- Microsoft PowerPoint or equivalent
- materials listed in Appendix B (Appendix C provides a detailed breakdown of these materials by activity.)

Course Pacing Guide

This course description and pacing guide is intended to help you stay on schedule with your work. Note that your course instructor may modify the schedule to meet the specific needs of your class.

Unit 1: The Solid Earth

Summary

You'll begin this unit by examining and comparing the appearance and composition of rocks and minerals. You'll also describe how rocks continually change through the rock cycle. Then you'll learn about convection currents and tectonic activity inside Earth that are responsible for the formation of Earth's geologic features. You'll use tectonic theories to explain the phenomena of continental drift, seafloor spreading and the origin

of Earth's magnetic field. Near the end of the unit, in a hands-on activity, you'll analyze the geological history of a region using topographic maps and satellite photographs.

Day	**Activity***/Objective*	Type
1 day: 1	**Syllabus and Student Orientation** *Review the Student Orientation and Course Syllabus at the beginning of this course.*	Course Orientation
3 days: 2–4	**Rocks and Minerals** *Examine a wide variety of rocks and minerals and formulate a scientific explanation for the variety of compositions that exist.*	Course Activity
3 days: 5–7	**Earth's Materials** *Compare rocks and other materials that cycle through Earth's crust and describe how they appear to observers on Earth's surface.*	Lesson
4 days: 8–11	**Plate Tectonics** *Model Earth's surface as a system of moving plates to explain the phenomena of continental drift and seafloor spreading.*	Lesson
4 days: 12–15	**Tectonic Mechanisms** *Identify where the energy for tectonic movement comes from and explain how mantle convections give rise to Earth's magnetic field.*	Lesson
4 days: 16–19	**Topographic Maps and Satellite Photographs** *Use topographic maps and satellite photographs to formulate the geological history of a region.*	Course Activity
4 days: 20–23	**Tectonic Features and Phenomena** *Explain how certain geographic and geologic features form as a direct result of tectonic activity.*	Lesson

Day	Activity/*Objective*	Type
4 days: 24–27	**Unit Activity and Discussion—Unit 1**	Unit Activity/ Discussion
1 day: 28	**Posttest—Unit 1**	Assessment

Unit 2: The Fluid Earth

Summary

In this unit, you'll focus on the interactions of the subsystems of Earth: hydrosphere, atmosphere, biosphere, and geosphere. You'll begin by modeling how Earth's hydrosphere (water) interacts with the other subsystems. In a hands-on activity, you'll demonstrate the processes of weathering and erosion and their impact on society. You'll also create models to analyze the role of fluids in the formation of the geosphere and identify changes in Earth's atmosphere since it first formed. Near the end of the unit, you'll differentiate between the phenomena of weather and climate, and you'll complete an activity in which you'll predict the weather using current weather data and regional maps.

Day	Activity/*Objective*	Type
4 days: 29–32	**The Hydrosphere** *Analyze the behavior of Earth's hydrosphere and model how it interacts with Earth's other subsystems.*	Lesson
4 days: 33–36	**Weathering and Erosion** *Build a model that demonstrates how the processes of weathering and erosion can affect human environments.*	Course Activity
4 days: 37–40	**Fluids and the Formation of Earth's Features** *Create physical and conceptual models to represent how fluids can form features in the geosphere.*	Lesson

Day	**Activity/***Objective*	Type
4 days: 41–44	**The Atmosphere** *Analyze data to identify changes in Earth's atmosphere since its formation and explain how the atmosphere interacts with other subsystems.*	Lesson
4 days: 45–48	**Observing and Predicting Weather** *Make predictions about future weather phenomena based on observations of current conditions.*	Course Activity
4 days: 49–52	**Weather** *Describe different types of weather and model how different factors, including subsystem interactions, can contribute to the formation of weather phenomena.*	Lesson
4 days: 53–56	**Climate** *Analyze the factors that drive Earth's climate and use evidence to predict climatic changes that are likely to occur in the future.*	Lesson
5 days: 57–61	**Unit Activity and Discussion—Unit 2**	Unit Activity/ Discussion
1 day: 62	**Posttest—Unit 2**	Assessment

Unit 3: Human Interactions

Summary

In this unit, you'll study the discovery, extraction, uses, and disposal of natural resources. You'll compare the costs of energy resources and predict the negative impacts that human activity can have on the natural cycles of Earth. You'll also describe the causes of pollution in Earth's fluid subsystems and propose cost-effective methods for mitigating pollution. Finally, you'll use models and mathematics to forecast the effects of climate change on Earth's ecosystems.

Day	**Activity/***Objective*	Type
4 days: 63–66	**Earth's Resources** *Identify natural resources that humans use and examine how discovery, extraction, uses, and disposal of those resources affects Earth's subsystems and humanity at large.*	Lesson
4 days: 67–70	**Comparing Energy Resources** *Compare energy resources that can be extracted from Earth in terms of cost, risks, and benefits.*	Course Activity
4 days: 71–74	**Human Interactions with Earth's Subsystems** *Explain how natural disasters affect human populations and predict how human activity will negatively influence the natural cycles of Earth.*	Lesson
4 days: 75–78	**Pollution in the Fluid Subsystems** *Describe the causes of pollution in Earth's fluid subsystems and evaluate small-scale mitigation practices in terms of cost and effectiveness.*	Course Activity
4 days: 79–82	**Global Climate Change** *Use models and mathematics to forecast the effects of climate change on Earth's ecosystems.*	Lesson
5 days: 83–87	**Unit Activity and Discussion—Unit 3**	Unit Activity/ Discussion
1 day: 88	**Posttest—Unit 3**	Assessment
1 day: 89	**Semester Review**	
1 day: 90	**End-of-Semester Exam**	Assessment

Appendix A: Safety Notes and Disclaimer

Each Course Activity and Unit Activity that includes a lab or experiment component will highlight key safety guidelines using the safety icon (), which appears directly in the activity. In addition to adhering to those guidelines, you must ensure that you follow these general safety practices:

- Work slowly and safely at all times, and abide by the safety notes and icons.
- Pay attention and be alert at all times. Limit any distractions.
- Keep your hands away from your nose, eyes, mouth, and other skin. Wash your hands before and after experiments.
- If you don't understand something, ask a teacher or an adult before proceeding.
- Wear the required protective gear.
- Adult supervision is required for all activities involving an experiment or lab component.
- Do not perform experiments that have not been approved. Follow the procedures.
- Follow good housekeeping practices. Keep your work area clean.
- Abide by all disposal instructions and icons to protect yourself and our planet.
- Report any problems or complications to an adult.

Note: *Edmentum assumes no liability for personal injury, death, property damage, equipment damage, or financial loss resulting from the instruction included in this course.*

Appendix B: Course Lab Materials (Semesters A and B)

Household Materials – Basic

The italicized materials listed below are available as a convenience in the *Edmentum Virginia Earth Science Kit*

- paper or poster board (standard letter size: 8.5 inches x 11 inches)
- pen, pencil, or fine-tip marker
- scissors
- ruler with English and metric scales
- toilet paper
- paper towels
- plastic spoon
- plastic bowl
- rubber band
- aluminum foil
- string, fishing line, or dental floss (at least 2 meters or 6 feet)
- sticky notes, or paper and tape
- 2 soft rags
- squeezable water bottle with sport cap
- 2 large glass beakers, glasses, or jars (250 to 500 milliliters or 8 to 16 ounces)
- large, transparent glass or plastic container (such as a pitcher)
- small, transparent glass beaker or jar (such as a baby food jar)
- small glass or jar (250 milliliters or 6 to 8 ounces)
- measuring cup (able to measure ¼ cup)
- measuring spoons: 1 teaspoon and 1 tablespoon
- 2 one-gallon jugs or pitchers
- bucket or trash can
- water from a natural water source such as a pond, stream, or well
- tap water
- distilled water (at least 100 milliliters, or about 4 ounces)
- white vinegar (at least 100 milliliters, or about 4 ounces)
- baking soda
- dry bar of soap
- sand
- 2 rocks (at least 1.5 inches or 4 centimeters in size.)
- calculator (optional)

- *iron nail*

Household Materials – Less Common

The italicized materials listed below are available as a convenience in the *Edmentum Virginia Earth Science Kit*

- stopwatch (could be a mobile app or on a computer)
- lamp with 150-watt incandescent bulb (or access to a sunny area)
- apron
- compass used to draw circles (optional)
- paintbrush, 1 inch or less in width
- plastic paint tray liner (or a stream table)
- 2 empty plastic soda bottles (2 liters each)
- modeling clay
- copper penny (dated 1982 or older)
- wooden blocks (approximately 2 inches thick)
- 4 to 5 toy building blocks or game pieces (anything that resembles a tiny model house)

- *disposable gloves*
- *safety goggles*
- *small magnet*
- *magnetic compass*
- *2 thermometers, continuous measurement; must measure up to 120° Fahrenheit (50° Celsius)*
- *2 cups dry plaster of Paris*
- *petroleum jelly*
- *food coloring*

Specialized Science Materials

All materials listed below are available in the *Edmentum Virginia Earth Science Kit.*

- *scale with at least 0.1 gram accuracy*
- *magnifying hand lens*
- *graduated cylinder, 100 or 250 milliliters*
- *limestone chips (50 grams total)*
- *mineral kit (including apatite, calcite, fluorite, graphite, gypsum, magnetite, feldspar, microcline, pyrite, quartz, and talc)*
- *porcelain streak plate*
- *glass streak plate*
- *water quality test kit, including test strips for pH and total alkalinity, total hardness, nitrate/nitrite, nitrite-nitrogen, iron (Fe+2/Fe+3), copper (Cu+1/Cu+2), free and total chlorine*
- *4 2-ounce plastic jars* (may use clear, clean glass baby food jars)
- *a bivalve shell* (may use a "household" item to fossilize, such as a leaf or a chicken bone)
- *binoculars (optional)*

Appendix C: Lab Materials by Activity (Semester B)

The italicized materials listed below are available in the *Edmentum Virginia Earth Science Kit.*

Unit	Activity Name	Task	Equipment List
B1	Course Activity: Rocks and Minerals **** Special lab materials required. (Edmentum Earth and Space Science Kit or school-provided lab materials)***	Task 1: Mineral Identification	Italicized items may be found in the *Edmentum Virginia Earth Science Kit's* bags labeled "Rocks and Minerals" and "Common Materials." • *mineral kit (including apatite, calcite, fluorite, graphite, gypsum, magnetite, feldspar/microcline, pyrite, quartz, and talc)* • *porcelain streak plate* • *glass streak plate* • *iron nail* • *small magnet* • *scale (with an accuracy of at least 0.1 grams)* • *graduated cylinder (100-milliliter or 250-milliliter)* • *magnifying hand lens (optional)* • water • copper penny (dated 1982 or older)
		Task 2: Characteristics of Rocks	• *magnifying hand lens* • 2 rocks (at least 1.5 inches or 4 centimeters in size and access to an outdoor area to collect them)
B1	Course Activity: Topographic Maps and Satellite Photos	Task 1: Constructing and Analyzing a Topographic Map	• lump of modeling clay (approximately 5 to 6 inches in diameter) • string (fishing line or dental floss works best) • ruler • pencil • 8.5 x 11-inch piece of paper

Unit	Activity Name	Task	Equipment List
B1	Unit Activity: The Solid Earth	Task 1: Modeling Earth's Convection Currents	Italicized items are found in the *Edmentum Virginia Earth Science Kit*. • *food coloring* • large, transparent glass or plastic container (such as a pitcher) • small, transparent glass beaker or jar (such as a baby food jar) • hot and cold tap water • aluminum foil • rubber band • 5 to 10 small pieces of paper, approximately 2 centimeters by 2 centimeters • pencil with a sharp point
B2	Course Activity: Weathering and Erosion **** Special lab materials required. (Edmentum Earth and Space Science Kit or school-provided lab materials)***	Task 1: Weathering Caused by Precipitation	Italicized items are found in the *Edmentum Virginia Earth Science Kit*. • *scale or balance with at least +/- 0.1 gram accuracy* • dry bar of soap • sink and faucet • stopwatch
		Task 2: Modeling River Erosion	• *safety goggles* • plastic paint tray liner (or a stream table) • sand • squeezable water bottle with sport cap • wooden blocks (approximately 2 inches thick) to make the base of the paint tray more level, or equivalent • 4 to 5 toy building blocks or game pieces to use as tiny model houses • paper towels • bucket, large container, or trash can to collect the excess water • string, fishing line, or dental floss (approximately 3 feet) • ruler with English and metric scales • pen or pencil

Unit	Activity Name	Task	Equipment List
B3	Unit Activity: Human Interactions **** Special lab materials required. (Edmentum Earth and Space Science Kit or school-provided lab materials)***	Task 1: Analyze and Compare Water Sources	Italicized items are found in the *Edmentum Virginia Earth Science Kit's* bag labeled "Human Interactions." • *water quality test kit, including test strips for pH and total alkalinity, total hardness, nitrate/nitrite, nitrite-nitrogen, iron (Fe+2/Fe+3), copper (Cu+1/Cu+2), and free and total chlorine* • 2 water-testing containers such as large glass beakers, glasses, or jars (250 to 500 milliliters or 8 to 16 ounces) • 2 one-gallon jugs or pitchers • tap water from a sink or water fountain • water from a natural water source such as a pond, stream, or well