

Material Covered:

The course is comprised of the following three main themes:

1. Astronomy
 - Stars and Galaxies
 - The Solar System
 - Earth's Moon
2. Geology and Tectonics
 - Atoms to Minerals
 - Rocks
 - Resources and the Environment
 - Plate Tectonics
3. Weather and Climate
 - Atmosphere
 - Water in the Atmosphere
 - The Water Planet

Textbook:

The course uses the textbook: *Earth Science* by Spaulding & Namowitz. ISBN 13: 978-0-618-11550-1.

Course Design:

This course examines the diverse aspects of earth and space science. Earth Science 11 will introduce astronomy, geology, plate tectonics, oceanography and hydrology. The course is designed with a Unit Test or a Unit Project after each unit worksheet. At the end of each main theme, there is a Cumulative Theme Project based upon inquiry questions of the students' choice.

Notebook:

Your notebook should be neatly organized, as this will help you study for tests. Label the unit and topic headings clearly at the top of the page. Answer questions fully, so that the information makes sense and can be used later for studying. Show what page number in the textbook the information comes from, so you can look it up again easily.

Grading:

This course works on a mastery system. You must pass the mastery tests in each unit to the 80% level before you can go on. In addition, there are cumulative tests or projects at the end of each major theme. Those tests or projects can only be submitted once, so be sure to do your best work on them. Your class mark for the course is based 60% on the unit tests and projects and 40% on the cumulative projects.

Stars and Galaxies

Goal:

The goal of this unit is to become familiar with selected characteristics of stars.

Objectives:

While completing this unit you will:

- Learn why constellations move in the night sky.
- Learn what an astronomical unit is.
- Investigate the physical properties of stars and their magnitudes.
- Learn about the differences between giants, super giants, and dwarf stars.
- Investigate the Hertzsprung-Russell Diagram and how it relates to the life stages of a star.
- Determine where stars come from.
- Learn how red giants, dwarfs, and supernovas are formed.
- Learn what galaxies are and their types.
- Investigate the origin of the universe.

What to Do in this Unit:

- Ask your teacher for the Unit 1 Worksheet.
- In the textbook, read Chapter 28, Stars and Galaxies, starting on p. 610.
- Answer the questions in the Unit 1 Worksheet. This will help you organize and understand what you have read.
- When you are ready, ask your teacher for the Unit 1 Test or Unit 1 Project. Remember, you must get 80% to pass, so studying hard is essential.

The Solar System

Goal:

The goal of this unit is to learn about the sun, our planets, and the solar system.

Objectives:

While completing this unit you will:

- Learn about the sun and its composition
- Learn about sunspots, solar flares, magnetic storms and solar wind.
- Determine the source of the sun's energy.
- Investigate the makeup of our solar system.
- Learn how to recognize planets.
- Investigate our planets.
- Learn about planetary moons, rings, comets, asteroids, meteors and meteoroids.

What to Do in this Unit:

- This unit uses Chapter 26, *The Sun and the Solar System*, and Chapter 27, *The Planets and the Solar System*, of the textbook.
- Ask your teacher for the Unit 2 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 2 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.

Earth's Moon

Goal:

The goal of this unit is investigate characteristics of the earth's moon.

Objectives:

While completing this unit you will:

- Compare selected characteristics of the moon and Earth.
- Learn how the lunar landscape was formed.
- Investigate erosion on the moon.
- Learn about lunar maria, mountains, craters, rays, and rilles.
- Investigate the differences between the front and back side of the moon.

What to Do in this Unit:

- This unit uses Chapter 25, *Earth's Moon*, starting on page 554 in the textbook.
- Ask your teacher for the Unit 3 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 3 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.
- **Go over your notes, tests, and worksheets from Units 1 - 3. When you are ready, ask your teacher for Theme Project #1 on *Earth and Its Solar System*. This test can only be written once, so good preparation is essential to do well.**

Atoms to Minerals

Goal:

The goal of this unit is learn about the composition and structure of minerals and how to identify minerals and mineral groups.

Objectives:

While completing this unit you will:

- Learn what minerals are and how they form.
- Investigate the structure of minerals and how the crystal structure affects their physical properties.
- Identify minerals by their physical and chemical properties.
- Describe the properties of various mineral groups, including silicates, carbonates, and oxides and sulfides.

What to Do in this Unit:

- This unit uses Chapter 5, Atoms to Minerals, starting with Section 5.2 on page 96 of the textbook
- Ask your teacher for the Unit 4 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 4 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.

Rocks

Goal:

The goal of this unit is to learn about rock formation on Earth.

Objectives:

While completing this unit you will:

- Learn the differences between the three families of rocks.
- Learn how to recognize igneous, sedimentary and metamorphic rocks and investigate how they are formed.
- Learn about the rock cycle.

What to Do in this Unit:

- This unit uses Chapter 6, *Rocks*, in the textbook, starting on page 116.
- Ask your teacher for the Unit 5 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 5 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.

Resources and the Environment

Goal:

The goal of this unit is to learn about renewable and non-renewable resources, their exploitation and the affect this has on the environment.

Objectives:

While completing this unit you will:

- Determine the difference between renewable and non-renewable resources.
- Understand what effect supply and demand has on the availability of mineral resources.
- Investigate various types of renewable and non-renewable energy resources.
- Learn about environmental risks and disadvantages associated with exploiting non-renewable resources.
- Understand how conservation and recycling can benefit both us and the environment.

What to Do in this Unit:

- This unit uses Chapter 7, *Resources and the Environment*, in the textbook, starting on page 142.
- Ask your teacher for the Unit 6 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 6 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.

Plate Tectonics

Goal:

The goal of this unit is to investigate plate tectonics.

Objectives:

While completing this unit you will:

- Investigate how large pieces of the Earth's crust move in an action called plate tectonics.
- Learn how thick the plates are.
- Learn why the plates move.
- Investigate the evidence for the theory of plate tectonics.
- Discover where earthquakes and volcanoes cluster around the earth.
- Learn how the magnetic polarity of igneous rocks supports the plate tectonics theory.
- Learn how heat flow and sea floor elevation support the plate tectonics theory.
- Learn about the four types of plate boundaries: diverging, sliding, converging, and subducting.

What to Do in this Unit:

- This unit uses Chapter 8, *Plate Tectonics*, in the textbook, starting on page 170.
- Ask your teacher for the Unit 7 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 7 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.
- **Go over your notes, tests, and worksheets from Units 4 - 7. When you are ready, ask your teacher for Theme Project #2 on *Geology and Tectonics*. This test can only be written once, so good preparation is essential to do well.**

Atmosphere

Goal:

The goal of this unit is to investigate the Earth's atmosphere.

Objectives:

While completing this unit you will:

- Learn about the composition of the atmosphere and how it remains fairly constant.
- Understand how gases move continually between the various parts of the Earth system.
- Investigate how the recycling of atmospheric materials is a delicate balance.
- Learn how the energy of the sun heats the atmosphere and the Earth's surface.
- Describe the many factors that affect how much solar energy the Earth's surface absorbs.
- Understand how human activities affect the atmosphere.

What to Do in this Unit:

- This unit uses Chapter 17, *Atmosphere*, in the textbook, starting on page 364.
- Ask your teacher for the Unit 8 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 8 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.

Water in the Atmosphere

Goal:

The goal of this unit is to investigate the water cycle and water in the Earth's atmosphere.

Objectives:

While completing this unit you will:

- Learn how water exists in the atmosphere, and what affects the amount there.
- Learn about the water cycle.
- Describe the three basic forms of clouds and how their shape reflects how the air is moving.
- Understand how precipitation forms and grows in clouds.
- Learn why precipitation falls where it does.

What to Do in this Unit:

- This unit uses Chapter 18, *Water in the Atmosphere*, starting on page 388 of the textbook, as well as Chapter 1, *Earth as a System*, on page 13.
- Ask your teacher for the Unit 9 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 9 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.

The Water Planet

Goal:

The goal of this unit is investigate the Earth's Oceans.

Objectives:

While completing this unit you will:

- Describe the unique chemical properties of water and how this affects the Earth's oceans.
- Understand how the density of water changes with temperature.
- Understand why water has polarity.
- Understand why aqueous solutions have different properties than pure water.
- Investigate the ocean properties of salinity and temperature.
- Learn about the diversity of life found in the Earth's oceans.

What to Do in this Unit:

- This unit uses Chapter 22, *The Water Planet*, in the textbook, starting on page 492 with Section 22.2.
- Ask your teacher for the Unit 10 Worksheet and do the work there.
- Hand in your worksheet so your teacher may see what you have done, and give you feedback on your work.
- When you are ready, ask your teacher for the Unit 10 Test or Project. Remember, you must get 80% to pass, so studying hard is essential to do well.
- **Go over your notes, tests, and worksheets from Units 8 - 10. When you are ready, ask your teacher for Theme Project #3 on *Atmospheric Science and Climate*. This test can only be written once, so good preparation is essential to do well.**

Congratulations! You've finished Earth Science 11!