

Options EHS Astronomy 2020		Scope and Sequence
Unit	Lesson	Objectives
<b>Science and Measurement</b>		
	Accuracy and Precision	
		Differentiate between accuracy and precision.
		Apply rules for using significant figures.
		Identify causes and effects of uncertainty in data.
	Experimental Design Principles	
		Distinguish between accuracy and precision.
		Explain the difference between replication and repetition.
		Write measurements in standard form and in scientific notation.
		Evaluate data to determine accuracy and reproducibility.
	Scientific Measurement	
		Explain the purpose of utilizing the metric system in scientific measurement.
		Identify the basic SI units utilized in scientific measurement.
		Calculate values utilizing the metric conversion process.
		Describe the use of significant figures and rounding in scientific measurement.
	Lab: Measurement	
		Demonstrate how scientific tools can be used to gather accurate measurements.
		Determine how to measure volume, mass, and density of regular and irregular objects.
		Science Practice: Develop a relationship between SI units and standard units.
	Analyzing Data and Drawing Conclusions	
		Analyze data to determine validity.

**Unit Lesson****Objectives**

Create charts and graphs to analyze trends in data.

Formulate a conclusion based on observations, data, and inferences.

Science Practice: Describe various ways evidence can be interpreted or explained.

**Earth, the Moon and Friends**

## The Solar System

Compare the geocentric and heliocentric models of the solar system.

Explain how Copernicus, Galileo, and Kepler contributed to the acceptance of the heliocentric model.

Identify objects that make up the solar system.

## The Solar System

Compare the Earth-centered and Sun-centered models of the solar system.

Explain that gravity holds the planets in their orbits around the Sun.

## Formation of the Solar System

Contrast ancient models of the solar system with the current model.

Estimate the age of our solar system.

Summarize two points of the nebular model, and describe how it can explain astronomical observations.

Explain how scientists think the moon was formed.

## Gravity and Motion

Identify what determines the strength of the force of gravity between two objects.

Describe two factors that keep the moon and Earth in orbit.

## The Dance of the Earth, Moon and Sun

Explain how Earth moves in space.

Explain what causes the phases of the moon.

**Unit Lesson****Objectives**

Describe solar and lunar eclipses.

Explain what causes tides.

## Earth-Moon-Sun System

Describe Kepler's three laws of planetary motion.

Solve problems using Kepler's laws.

Explain the effects of Earth, the moon, and the Sun on each other.

## Planets

Identify characteristics shared by the inner planets.

Identify characteristics shared by the outer planets.

Identify each planet in the solar system.

## The Outer Planets

Describe the physical properties, locations, and movements of each of the outer planets.

Compare and contrast the properties of the outer planets to those of the inner planets.

Science Practice: Organize data into tables and charts.

## Other Objects in the Solar System

Distinguish between comets, asteroids, and meteoroids.

Explain the difference between meteoroids, meteors, and meteorites.

Describe the characteristics of dwarf planets.

Science Practice: Examine how life may be affected when cosmic objects impact Earth.

## The Sun

Describe the structure, composition, and physical properties of the Sun.

Explain how the Sun generates energy.

**Unit Lesson****Objectives**

Discuss the different types of solar activity and explain how each activity affects Earth.

Science Practice: Describe units used by astronomers to measure the distance between the Sun and Earth.

## Early Earth History

Identify characteristic Precambrian and Paleozoic life-forms.

Draw conclusions about how species adapted to changing environments in Precambrian time and the Paleozoic Era.

Describe changes in Earth and its life-forms at the end of the Paleozoic Era.

## Middle and Recent Earth History

Compare and contrast characteristic life-forms in the Mesozoic and Cenozoic Eras.

Explain how changes caused by plate tectonics affected organisms during the Mesozoic Era.

Identify when humans first appeared on Earth.

## Systems of the Biosphere

Describe Earth's systems in terms of energy, matter, time, and space.

Explain the interactions between Earth's systems.

## Patterns in Systems

Describe various patterns found in the Earth system.

Identify methods of measuring constancy and change in a system.

## Convection and Mantle

Explain how heat is transferred.

Identify what causes convection currents.

Describe convection currents in Earth's mantle.

## Restless Continents

Describe Wegner's hypothesis of continental drift.

**Unit Lesson****Objectives**

Explain how sea-floor spreading provides a way for continents to move.

Describe how new oceanic lithosphere forms at mid-ocean ridges.

Explain how magnetic reversals provide evidence for sea-floor spreading.

## Theory of Plate Tectonics

Summarize the theory of plate tectonics.

Describe the processes and features that occur at the three types of plate boundaries.

Explain how movement in the mantle is related to plate motion.

Science Practice: Examine a map to identify Earth's major tectonic plates.

## Deforming the Earth's Crust

Describe two types of stress that deform rocks.

Describe three major types of folds.

Explain the differences between the three major types of faults.

Identify the most common types of mountains.

Explain the difference between uplift and subsidence.

## Forces in Earth's Crust

Explain how stress in the crust changes Earth's surface.

Describe where faults are usually found and why they form.

Identify the land features that result from plate movement.

**Stars and Galaxies and The Universe**

## Stars

Identify the physical properties of stars.

Explain how stars are classified.

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		Explain how a star forms.
		Explain what happens as a star runs out of fuel.
	The Life and Death of Stars	
		Describe the basic structure and properties of stars.
		Explain how the surface temperature of a star is measured.
		Recognize that all normal stars are powered by fusion reactions that form elements.
		Identify the stages in the evolution of stars.
	Star Systems and Galaxies	
		Describe star systems.
		Distinguish the major types of galaxies.
	Galaxies and the Universe	
		Identify the different types of galaxies.
		Discuss the organization of the universe.
		Summarize the Big Bang Theory and discuss the evidence that supports it.
		Science Practice: Describe units used by astronomers to measure the distances to stars and galaxies.
	Origin and Evolution of the Universe	
		Examine evidence for the big bang theory.
		Describe the evolution of the universe.
		Distinguish between the different types of stars and their life cycles.
		Analyze how stellar spectra are used to identify the composition and motion of a star.
	Using Light	
		Describe how magnifying glasses, microscopes, telescopes, and cameras work.

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		Differentiate laser light from regular light and identify uses of lasers.
		Identify uses of fiber optics.
	Space Technology	
		Describe the history and future of space exploration.
		Identify the role of technology in space exploration.
	Test	
<b>Diagnostic PostTest</b>		
	TEST	