



Unit 1: Our Place in Space

Subject Area: Science	Course: 6th Grade Science		
Unit Title: Our Place In Space	Grade(s): 6	Start: September 1st	End: December 5th
Unit Summary: This unit includes current theories of the origins, size, and scale of the Universe, as well as the unique aspects of Earth in comparison to other planets of the solar system. Additionally, students are introduced to the future of space travel, including the possibility of colonization of Mars. Students review planetary motion by looking at the movement of Earth, Moon, and Sun as they relate to seasons, moon phases, tides, and eclipses.			

Stage 1: Desired Results

Massachusetts Learning Standards

- 6.MS-ESS1-5(MA). Use graphical displays to illustrate that Earth and its solar system are one of many in the Milky Way galaxy, which is one of billions of galaxies in the universe.
- 6.MS-ESS1-1a. Develop and use a model of the Earth-Sun-Moon system to explain the causes of lunar phases and eclipses of the Sun and Moon.
- 6.MS-PS2-4. Use evidence to support the claim that gravitational forces between objects are attractive and are only noticeable when one or both of the objects have a very large mass.
- 6.MS-PS4-1. Use diagrams of a simple wave to explain that (a) a wave has a repeating pattern with a specific amplitude, frequency, and wavelength, and (b) the amplitude of a wave is related to the energy of the wave.
- 6.MS-PS4-2. Use diagrams and other models to show that both light rays and mechanical waves are reflected, absorbed, or transmitted through various materials.
- 6.MS-PS1-7(MA). Use a particulate model of matter to explain that density is the amount of matter (mass) in a given volume. Apply proportional reasoning to describe, calculate, and compare relative densities of different materials.

Transfer (Authentic, relevant application of learning to new situations)

- Students will be able to independently use their learning to follow trends in Space exploration and understand why humans want and need to expand into colonizing space

Meaning

Enduring Understandings

Students will understand that...

- Earth is situated in an ever expanding universe
- Scientists use light waves to study that which

Essential Questions

Students will consider...

- What makes up the universe?
- How does gravity affect objects in our solar system?
- How does our solar system fit into the Milky Way

we can not reach or observe directly ● Gravity is a fundamental force that is responsible for the formation and behavior of objects in the Universe ● The Earth, Moon and Sun's position are responsible for the phenomena of Moon Phases and Eclipses ● Waves are our primary means of studying space	and how does the Milky Way fit into the Universe? ● Why is the Sun so important to our planet? ● How do the Sun, Moon, and Earth move to produce days, seasons, years, and eclipses? ● What makes up a light wave and how do we use light waves to determine the distances and movement of objects in space? ● How does mass and volume determine an object's density? ● How does mass and distance affect gravity?
Acquisition	
Knowledge Students will know... ● Our "Cosmic Address" or place in the organization of the Universe ● Recognize characteristics of celestial objects/groups ● The sequence of events in the Big Bang Theory ● Evidence supporting the Big Bang Theory ● the parts of a wave and explain how waves and light are related how the properties of light waves are used to study space ● The Laws of Gravity ● The relationship between the Sun, Earth, and Moon ● Causes of Moon phases and Eclipses	Skills Students will be skilled at... ● Students will be able to make observations, inferences and predictions ● Making models to understand patterns and relationships between objects