

**LISBON SCHOOL DEPARTMENT**  
**UNIT DESIGN OUTLINE**

Unit Title: Unit 7: Models of the Universe

Unit Designers: Jill Denniston

Level(s): Freshmen Time Span: 2 weeks

**Content Area:**

- |  |                                      |  |   |
|--|--------------------------------------|--|---|
| <input type="checkbox"/> Career Prep           | <input type="checkbox"/> Health/PE   | <input type="checkbox"/> M&C Languages             | <input type="checkbox"/> Social Studies     |
| <input type="checkbox"/> English Language Arts | <input type="checkbox"/> Mathematics | <input checked="" type="checkbox"/> Science & Tech | <input type="checkbox"/> Visual & Per. Arts |

**Summary of Unit:**

In this unit students will be introduced to basic key concepts related to the study of the universe. Interactions among the Earth-Moon-Sun system set up conditions that produce the different phases of the Moon and eclipses of the Sun and the Moon. Tides on Earth are produced by interactions among the Earth-Moon-Sun system. In addition the entire solar system lies within a large cloud of comets that completely surrounds the Sun, the planets, the asteroids and many other objects. Students will understand the immense scale of space and the overall structure of the universe.

**Content Standards/Performance Indicators:**

**D1** Students explain the physical formation and changing nature of our universe and solar system, and how our past and present knowledge of the universe and solar system developed.

- a. Explain why the unit of light years can be used to describe distance.
- b. Explain the role of gravity in forming and maintaining planets, stars, and the solar system
- c. Outline the age, origin, and process of formation of the universe as currently understood by science.
- d. Describe the major events that have led to our current understanding of the universe and the current technologies used to further our understanding.

**Key Pre-Requisites:**

**Knowledge**

Review vocabulary:

phases of the moon, eclipses, galaxies, stars, planets, asteroids and comets,  
electromagnetic spectrum

**Enduring Understandings:**

Gravity from the Earth-Moon-Sun system directly affects what it's like to live here on Earth  
Days and years are measurements of Earth's movements  
The Moon is our nearest neighbor in space and affects Earth in many ways  
Understanding the solar system helps you understand Earth's position in space.  
The Sun is the star that provides energy for life on Earth.  
That Earth is part of the Milky Way galaxy.

**Essential Questions that Guide and Focus This Unit:**

How light years are used to measure distance?

How does the role of gravity influence the forming and maintaining planets, stars, and the solar system?

What discoveries were made that help lead to the current model or understanding of our universe?

**Key Knowledge and Skills students will acquire as a result of this unit:**

**Knowledge:**

Light year measures distance, not time

Our solar system operates under the Heliocentric Model

Astronomical unit (AU) is used to measure large distances within the solar system.

Tides are a result of the pull of gravity from the Sun and Moon.

The Red-shift is used to explain the expansion of our universe.

**Skills:**

Describe how the moon causes tides on Earth.

Describe the difference between the geocentric model and the heliocentric model.

Compare and contrast types of optical telescopes.

Explain how a radio telescope differs from an optical one.

**How will students provide evidence of their understandings?**

Lab activity: Gravity and Jumping on the Planets. D1 b

Research constellation D1 b

Outline birth and death of a star D1 d

**Teaching and Learning experiences used to help students understand:**

Lectures

Demos

Labs and activities

Reading textbook

Taking notes

Use of Internet for research

Use of computer-lab probes.

**Provisions for Extending Learning:**

**How will technology be used to increase student achievement?**

**Instructional Resources:**

Attach a copy of the unit assessment tool, including criteria for evaluation of student performance/product.

***Models of the Universe***