# Saint Patrick High School

## Curriculum Guide: Space Science

| | | | |
|---|---|---|---|
| **Department:** | Science | **Grade and Level:** | 11 & 12 |
| **Class:** | Space Science | **Term (Semester or Year):** | Semester course |

| | |
|---|---|
| **Required Text:** | Glencoe Science: Earth Science (McGraw Hill)<br>(Chapters posted onto class website by Unit) |
| **Additional Resources (i.e. texts, materials, apps, etc.):** | iPad Apps<br>GoodReader<br>Pages<br>Keynote<br>Nearpod<br>cK-12 Study Now<br>Khan Academy<br>iTunes |

### Course Description

This course continues to investigate the topics of Earth and Space Science I and delves into our solar systems and the sun's effects on Earth. Looking beyond our solar system, the course will study the life cycle of stars and astronomy in general. The course will detail history of astronomy from ancient civilizations, the space race, and current events. The
development of the solar system, planets, sun and our moon and their impact on one another is explored. Graphical analysis continues to fuel the inquiry-based approach to learning.

### Use of Pilot Units:

As part of our push into the new STEM curriculum for the coming years, we may be piloting one or more units this year that will focus on Nature of Science and Inquiry based instruction. This may include but is not limited to student led initiatives surrounding observations of Lunar Cycles, and student use of local Observatories.

### Academic Standards Addressed (NGSS):

- HS-ESS1-1. Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually

reaches Earth in the form of radiation.

- HS-ESS1-2. Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.

- HS-ESS1-3. Communicate scientific ideas about the way stars, over their life cycle, produce elements.

- HS-ESS1-4. Use mathematical or computational representations to predict the motion of orbiting objects in the solar system.

- HS-ESS1-6. Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.

## Unit Themes (Table of Contents)

| | |
|---|---|
| **Theme 1:** | Introduction & History of Astronomy |
| **Theme 2:** | The Sun, Moon, Earth System |
| **Theme 3:** | Solar System & Planet Formation |
| **Theme 4:** | The Sun & Stars |

## Agreed Upon Assessments

Forms of assessments may include but are not limited to….

- Objective tests
- Lab activities
- Lectures/Discussions
- Group Projects/Presentations
- Homework Assignments
- Supplemental Readings

| | | | |
|---|---|---|---|
| **Unit:** | Intro Unit & History | **Duration:** | 4 weeks |

## Essential Questions:

- What is the nature of science?
- What is Astronomy?
- How have humans studied space?
- What are the constellations & how are they used?

## Affirmation Statements:

Students will be able to…:

- Explain how ancient astronomers studied the night sky
- Describe the space race and its implications
- Explain the two types of telescopes
- What are the major winter constellations?

- Locate stars based on altitude and azimuth

## Quizzes:

- Quiz#1-Ancient Astronomy & Space Race
- Quiz#2-Constellations and Telescopes
- Lab Safety Quiz

## Common Assessments:

- Unit 1 Test

| **Unit:** | The Sun, Moon, Earth System | **Duration:** | 3 weeks |
|---|---|---|---|

- What is the moon?
- How did the moon form?
- What are the properties of the moon?
- How do eclipses occur?
- What are seasons?

## Affirmation Statements:

Students will be able to…:

- Describe history of lunar exploration
- Recognize the lunar properties and structures
- Identify features of the moon
- Explain how moon formed
- Explain what causes the seasons
- Identify the phases of the moon
- Identify relative positions of the sun, earth, and moon

## Quizzes:

- Quiz#1- 27.2 Moon Quiz
- Quiz#2-27.3 Moon Quiz

## Common Assessments:

- Unit 2 Test

| **Unit:** | Solar System & Planet Formation | **Duration:** | 5 weeks |
|---|---|---|---|

- How did the solar system form?
- How are the inner planets different from the outer planets?
- What is the evidence for the nebular theory?

## Affirmation Statements:

Students will be able to…:

- Distinguish between inner and outer planets
- Describe how the solar system formed
- List evidence for formation of solar system
- Identify the planets, describe their features
- List important moons
- Explain where life may be found in solar system

## Quizzes:

- Quiz#1- 28.1 & 28.2 Quiz
- Quiz#2-28.3 Outer Planets
- Quiz#3-28.4 Other Solar System Objects

## Common Assessments:

- Unit 3 Test

| **Unit:** | The Sun & Stars | **Duration:** | 4 weeks |
|---|---|---|---|

## Essential Questions:

- What are stars?
- How are stars measured?
- How does our sun relate to other stars?
- Where do stars get their energy?

## Affirmation Statements:

Students will be able to…:

- Determine how distances between stars are measured
- Distinguish between brightness and luminosity
- Identify proper ways to measure/classify stars
- Describe the layers and features of stars
- Explain the process of energy production in the Sun

## Quizzes:

- Quiz#1- Sun Diagram

## Common Assessments:

- Unit 4 Test