

ASTRONOMY

Strand 1: Patterns Observed on Earth and in the Night SkyAffect Life on Earth and Space Exploration

Priority Standards

- **Develop and use models** to evaluate the relationship between the relative positions of the Earth, Sun, and Moon and the phenomena caused by the relationship as observed from Earth
- **Plan and carry out an investigation** using the celestial sphere to explain how latitude and time of year affect the visibility of constellations, planets, and other celestial objects.
- **Obtain, evaluate, and communicate information** about how patterns in ancient structures, instruments, philosophies, and civilizations influenced the study of astronomy.
- **Plan and carry out an investigation** to analyze patterns in telescopic data of various electromagnetic spectra to explain astronomical phenomena.
- **Construct an argument** based on evidence for the significance of historical and future space exploration as they relate to affecting leaps in technology, cultural cooperation, knowledge, and inspiration.

Strand 2: Structures in the Solar System and Their Formation

Priority Standards

- **Ask questions to investigate** and communicate the structure and properties of objects in our solar system and the zones they inhabit.
- **Develop and use models**, based on evidence, to explain the formation of the solar system and the different proportions of matter and energy within regions of the solar system.
- **Use computational thinking** to model gravitational force at varying scale and proportion that explain motion and interaction of objects in the solar system.
- **Design a solution** (plan) for a functioning human colony on an object in the solar system other than Earth. *Define the problem, identify criteria and constraints, develop possible solutions using models, analyze data to make improvements from iteratively testing solutions, and optimize the solution.*

Strand 3: Stability and Change in the Life of Stars

Priority Standards

- **Develop an use models** to explain stability and change during the process of stellar evolution from birth to death of a star.
- **Construct an argument** based on evidence from the Hertzsprung-Russell diagram to investigate properties (structure) of stars.
- **Ask questions** to evaluate evidence that predicts the stability and change of a star during its lifespan and its final stage of stellar evolution based on mass.



Strand 4: Matter and Energy in Galaxies and the Universe

Priority Standards

- **Construct an argument** from evidence to explain the patterns that describe the formation of the universe.
- **Use models** to describe the conditions of the early universe that led the formation and evolution of matter including the birth of the first stars and galaxies.
- **Construct an explanation** using evidence to support the existence of dark matter and dark energy.
- **Develop and use models** to relate the cause for how galactic evolution occurs.

Science and Engineering Practices

- Asking questions or defining problems
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations and designing solutions
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information