

Astronomy

Adopted 2019

Obtain, evaluate, and communicate information to assess the validity of historical theories of astronomy. **SAST1**

- a.** Ask questions to investigate the daily/seasonal motions of the sky and communicate the significance of constellations, for navigation and time-keeping. **SAST1.A**
- b.** Obtain, evaluate and communicate information about how ancient structures, instruments, philosophies and civilizations influenced ancient astronomy. **SAST1.B**
- c.** Construct an argument based on evidence to support the scientific claims made by the heliocentric model. **SAST1.C**
- d.** Use mathematics and computational thinking to relate Kepler's Laws to Newton's Law of Gravitation. **SAST1.D**
- e.** Construct an explanation for how technological advances in the design of reflecting and refracting telescopes have improved our ability to study the universe. **SAST1.E**

Obtain, evaluate, and communicate information to explain astronomical observations made from the point of reference of Earth. **SAST2**

- a.** Develop and use models to evaluate the relationship between the relative positions of the Earth, Moon and Sun and observable phenomena. **SAST2.A**
- b.** Plan and carry out an investigation using the celestial sphere to explain how latitude and time of year affect visibility of constellations and other celestial objects. **SAST2.B**
- c.** Develop and use models of relative orbital motion of planets within our solar system to explain retrograde motion. **SAST2.C**
- d.** Use mathematics and computational thinking to explain the relationship between the properties of light and the vast distances in the cosmos. **SAST2.D**
- e.** Plan and carry out an investigation to analyze the electromagnetic spectrum and spectroscopic data to obtain information about the inherent properties and motions of objects. **SAST2.E**

Obtain, evaluate, and communicate information to illustrate the formation of the

- a.** Develop and use models to explain the formation of the solar system. **SAST3.A**
- b.** Develop and use models to explain the chemical composition and characteristics of the Sun and other solar system objects. **SAST3.B**

solar system and the properties of celestial objects within it. [SAST3](#)

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- c. Ask questions to investigate and communicate major properties of our solar system bodies and the zones they inhabit. [SAST3.C](#)**
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Obtain, evaluate, and communicate information to describe the scientific view of the origin of the universe, the evolution of matter, and the development of galaxies. [SAST4](#)

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- a. Construct an argument from evidence in support of the Big Bang theory. [SAST4.A](#)**
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- b. Use models to describe the conditions of the early universe that led to the formation and evolution of matter as well as the birth of the first stars and galaxies. [SAST4.B](#)**
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- c. Construct an explanation using indirect evidence to support the existence of dark matter and dark energy. [SAST4.C](#)**
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- d. Develop and use models to relate how galactic evolution occurs through mergers and collisions. [SAST4.D](#)**
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Obtain, evaluate, and communicate information about the connections between mass, gravity and fusion with respect to the life cycle of stars. [SAST5](#)

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- a. Develop and use models to explain the process of stellar evolution from star birth to star death, including binary systems. [SAST5.A](#)**
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- b. Construct an argument based on evidence from the Hertzsprung-Russell diagram to assess the properties of stars, including density, luminosity, temperature, rates of fusion, and spectral class. [SAST5.B](#)**
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- c. Ask questions to evaluate evidence that predicts the lifespan and final stage of stellar evolution based on mass. [SAST5.C](#)**
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- d. Construct an argument based on evidence that explores the connections among various cosmic phenomena and leading theories. [SAST5.D](#)**
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Obtain, evaluate, and communicate information to discuss how the past, current, and future explorations of space impact our investigations of the connections between cosmic phenomena and conditions necessary for life. [SAST6](#)

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- a. Construct an argument based on evidence of the significance of historical and future space exploration as they relate to leaps in technology, cultural cooperation, knowledge, and inspiration. [SAST6.A](#)**
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- b. Analyze and interpret telescopic data of various electromagnetic spectra in order to evaluate the uses and advantages of the data from each. [SAST6.B](#)**
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- c. Construct an explanation for the existence and importance of habitable zones, habitable planetary bodies, and possible signatures of life in our own and in other solar systems. [SAST6.C](#)**
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- d. Construct an explanation of how astronomical and planetary hazards and global atmospheric changes have impacted the evolution of life on Earth. [SAST6.D](#)**
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