



JC Schools Astronomy I Yearly Standards

Unit	Priority Standards
<p>Unit 1</p> <p>Observational Astronomy</p>	<p>9-12.JCSD.ESS1.A.1 DESCRIBE and EXPLAIN the <u>historical origins of the perceived patterns of constellations and the role of constellations in ancient and modern navigation.</u></p> <p>9-12.JCSD.ESS2.A.3 RELATE the Earth’s coordinate system (e.g., latitude and longitude) to astronomical observations.</p> <p>9-12.JCSD.ESS1.A.5 DESCRIBE the <u>apparent motion of celestial objects to infer solar system models (i.e., geocentric and heliocentric).</u></p> <p>9-12.JCSD.ESS1.A.9 ILLUSTRATE <u>how monthly changes in the patterns of stars (constellations) occur in the sky as the Earth revolves around the sun.</u></p> <p>9-12.ETS1.B USE <u>a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.</u></p>
<p>Unit 2</p> <p>Advancements in Astronomy <u>Semester 1</u></p>	<p>9-12.JCSD.PS4.A.1 COMPARE and CONTRAST <u>types of telescopes (e.g., optical, radio, infrared, ultraviolet) and the ways in which they are used to acquire information on star characteristics.</u></p> <p>9-12.JCSD.ESS2.A.4</p>

	<p>RECOGNIZE <u>the historical, present, and future role of technology and exploration in obtaining knowledge about the universe.</u></p> <p>9-12.JCSD.ESS2.A.5 DISCUSS <u>recent technological advancements in space technology and assess the pros and cons of these advancements and space exploration.</u></p> <p>9-12.JCSD.ESS1.B.9 DESCRIBE <u>historical methods of inferring the size, structure, and motions of the galaxy and the solar system (e.g., star observations and counts)</u></p> <p>9-12.ETS1.A.1 ANALYZE <u>a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.</u></p>
<p>Unit 3 Earth, Moon, and Sun</p>	<p>9-12.JCSD.ESS1.B.4 DEMONSTRATE <u>an understanding of the consequences of the earth’s relative position and motion with respect to the sun (e.g., length of the day, change of seasons, length of year).</u></p> <p>9-12.JCSD.ESS1.B.3 RELATE <u>surface features of the Earth’s moon (e.g., maria, craters, highlands) to events in the history of the moon.</u></p> <p>9-12.JCSD.ESS1.B.5 ANALYZE <u>the consequences of the relative positions and motions of the earth, the moon, and the sun (e.g., phases of the moon, tides, eclipses).</u></p> <p>9-12.JCSD.ESS2.A.1 DEMONSTRATE <u>an understanding of the physical characteristics of the earth (e.g., diameter, the tilt of the axis, distance from the sun) and how they can be determined.</u></p>
<p>Unit 4 Forces and Light</p>	<p>9-12.ESS1.A.2 CONSTRUCT <u>an explanation of the Big Bang theory based on astronomical evidence of light spectra, the motion of distant galaxies, and the composition of matter in the universe. [Clarification Statement: Emphasis is on the astronomical evidence of the red shift of light from galaxies as an indication that the universe is currently expanding,</u></p>

the cosmic microwave background as the remnant radiation from the Big Bang, and the observed composition of the ordinary matter of the universe, primarily found in stars and interstellar gases (from the spectra of electromagnetic radiation from stars), which matches that predicted by the Big Bang theory (3/4 hydrogen and 1/4 helium).]

9-12.ESS1.B.1

USE Kepler's Law to predict the motion of orbiting objects in the solar system. [Clarification Statement: Emphasis is on Newtonian gravitational laws governing orbital motions, which apply to human-made satellites as well as planets and moons.]

9-12.JCSD.ESS1.A.7

ANALYZE how the mass of the planets and the sun, and the distance between the planets and the sun affect the gravitational force of the sun on the planets.

9-12.PS2.B.1

USE mathematical representations of Newton's Law of Gravitation to describe and predict the gravitational forces between objects. [Clarification Statement: Emphasis is on both quantitative and conceptual descriptions of gravitational and electric fields.]