Ridgefield Public Schools

Astronomy
Curriculum at a Glance

Overview

Astronomy is the study of everything in the universe. Astronomers investigate the various types of matter and energy found throughout the cosmos. Using astronomical observations, online simulations and hands-on activities, students will develop an understanding and appreciation of the origin and evolution of the universe; its galaxies, stars and solar systems. This course explores concepts in physics, chemistry, biology and earth science. Throughout the course, a special emphasis is placed on the role astronomical ideas have had on the development of human consciousness.

Units of Study	
Unit 1:	**Cosmic Address** • Scales of the Universe App • Powers of Ten/Scientific Notation Activity • *Cosmic Voyage* Imax Film • Cosmic Address Task (Unit Conversion)
Unit 2:	**Naked-Eye Astronomy** • Reasons for Seasons & Solar Motion Activity • Understanding/Modeling Moon Phases • Telling Time by the Moon Activity • Exploring Eclipses (Lunar, Solar, Annular)
Unit 3:	**Constellations and Celestial Navigation** • Star Chart & Celestial Coordinates Activity • Modeling Seasonal/Circumpolar Constellations • The Zodiac/The Planets/Astrology & Precession of the Equinoxes • StarLab Planetarium Activities (Sky Myths)

Unit 4:	**History of Astronomy** • Appreciating Ptolemy's Geocentrism (Epicycles) • Investigating the Retrograde Motion of Mars • Heliocentric Revolution (Copernicus) • Galileo's Telescope/ The Birth of Observational Astronomy • Kepler's Laws of Planetary Motion Activity
Unit 5:	**Optics and Light** • Investigating the Electromagnetic Spectrum (Wavelength vs. Energy) • Using Spectra to Determine Physical Properties • Understanding the Inverse-Square Law for Light • Exploring Apparent & Absolute Magnitudes (Distance Modulus)
Unit 6:	**Cosmology** • Messier Objects & the Great Debate • Redshift of Galaxies Activity (Doppler Effect) • Visualizing the Cosmic Background Radiation • Appreciating the Big Bang Cosmology • Calculating the Hubble Constant/Age of the Universe
Unit 7:	**Stellar Evolution & Fusion** • Stellar Evolution Graphic Organizer • Utilizing Hertzsprung-Russell Diagrams • Stellar Fusion: "We Are Star Stuff!" • Appreciating Weird Physics: Black Holes & Neutron Stars
Unit 8:	**Solar System Science** • Understanding the Nebular Hypothesis • Formation/Differentiation of Earth & Moon • Comparative Planetology Activity/Research Task • History of Exploration (Apollo, Viking, Voyager, Cassini, New Horizons) • Mars: Past, Present & Future

Unit 9:	**Auroras and Spaceweather** ● Understanding Solar Activity (Sunspots, Flares, Coronal Mass Ejections) ● Observing the Sunspot Cycle/Human Impacts ● Appreciating Auroras on Earth & Elsewhere ● Solar Observing Safety (Filters & Pinhole Projections)
Unit 10:	**Exoplanets and SETI** ● Exploring Fermi's Paradox/Search for Extraterrestrial Intelligence ● Investigating Variables with Drake Equation Activity ● Detecting & Classifying Exoplanets ● The future of Space Exploration