

Astronomy Objectives 2014-2015

You will be able to understand, analyze, evaluate, and write about reports of astronomical objects, phenomena, and discoveries. This requires you to have an understanding of scientific inquiry and essential astronomical concepts, and to apply that knowledge to the reports.

- I. Interpret and research astronomical accounts
 - A. Interpret and evaluate astronomical reports and images.
 - B. Research astronomical topics, showing command of various sources.
- II. Conduct astronomical investigations
 - A. Pose questions, select data to answer a particular question.
 - B. Collect and organize data.
 - C. Make and defend a conclusion based on evidence.
- III. Describe, predict and explain celestial observations
 - A. Identify constellations, describe and predict motion of stars in the night sky.
 - B. Describe and predict daily, monthly and annual cycles of the sun and moon.
 - C. Make celestial observations with a telescope.
- IV. Apply concepts and skills from related disciplines
 - A. Apply mathematical reasoning to astronomical situations.
 - B. Apply concepts of light propagation, analyze light spectra.
 - C. Explain and analyze astronomical motions in terms of newtonian gravitation.
 - D. Apply concepts of atomic and nuclear chemistry.

Describe and explain the structure, scale and evolution of worlds, stars, and the universe. In particular:

- V. *Worlds* - Apply scientific reasoning and astronomical evidence to construct an account of planets' formation and early history.
 - A. Classify solar system objects.
 - B. Identify and sequence process that shape terrestrial surfaces.
 - C. Justify model for formation of solar system.
 - D. Gather and evaluate evidence for exoplanets.
- VI. *Stars* - Communicate scientific ideas about the life cycles of stars, their energy flow, and the production of elements.
 - A. Trace the flow of energy from the sun's core to its surface and beyond.
 - B. Explain how the properties of stars are determined.
 - C. Trace the life cycle of low to medium stars, and justify this knowledge.
 - D. Explain the fate of large-mass stars and describe their remnants.
- VII. *Universe* - Construct an explanation of the Big Bang model using astronomical evidence.
 - A. Explain the nature of our galaxy and the supporting observations.
 - B. Classify galaxies and give evidence for their distribution & properties.
 - C. Support the current "Big Bang" cosmology with observational evidence.