



Task: Signals from the Cosmos-Deciphering Messages from the Stars

Alignment of Performance Task with National Standards

Grade Level: 9-12

Specific skills and knowledge demonstrated by the task:	Alignment with Project 2061 Benchmarks for Science Literacy	Alignment with National Science Education Standards
Students' understanding of the structure and evolution of a cosmic object, such as supernovae, including the radiation emitted from it.	<p>4A Universe (9-12)#2 ... Eventually, some stars exploded producing clouds containing heavy elements from which other stars (and presumably planets orbiting them) could later condense. The process of star formation and destruction continues.</p> <p>4F- Motion (9-12)#3: ...A great variety of, radiation is in the form of electromagnetic waves: radio waves, microwaves, radiant heat, visible light, ultraviolet radiation, x-rays, and gamma rays. These wavelengths vary from radio waves, the longest, to gamma rays, the shortest....</p>	<p>Standard D: Earth and Space- The Origin and Evolution of the Universe- Stars produce energy from nuclear reactions, primarily the fusion of hydrogen to form helium, These and other processes in stars have led to the formation of all the other elements.</p> <p>Standard B Physical Science: Interactions of Energy and Matter#2 ...Electromagnetic waves include radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, x-rays, and gamma rays...</p>
Students understanding of how scientists gather data about objects, such as supernovae, and explain phenomena in our universe.	4A- Universe (9-12)#3: Increasingly sophisticated technology is used to learn about the universe. Visual, radio and x-ray telescopes collect information from across the entire spectrum of electromagnetic waves; computers handle an avalanche of data and increasingly complicated computations to interpret them....	Standard A Inquiry: Understandings about Scientific Inquiry #3- Scientists rely on technology to enhance the gathering and manipulation of data. New techniques and tools provide new evidence to guide inquiry and new methods to gather data, thereby contributing to the advance of science.
Students' ability to interpret information, analyze data, and draw conclusions from the Chandra project.	Chapter 1B Essay- Scientific Inquiry (overview of inquiry)	Standard A Inquiry- Abilities Necessary to Do Inquiry- organization and display of data...explanation...reviewing information...summarizing data
Students' ability to effectively communicate scientific ideas and findings.	12D Communication Skills- Essay- "clear and accurate communication"	Standard A: Inquiry- Communication: ...accurate and effective communication

		including expressing concepts, reviewing information, summarizing data, using language appropriately, developing diagrams and charts...
Students' ability to access information for research using computers.	(Not specifically mentioned in Benchmarks)	Standard A Inquiry- Use Technology to Improve Investigations and Communications- The use of computers for the collection, analysis, and display of data...