The Next Generation Science Standards include cosmology as the first section of Earth and Space Sciences: Earth's Place in the Universe: The Universe and its Stars. Here is the description from the National Academy of Sciences' "A Framework for K-12 Science Education: Practices, Cross-cutting Concepts, and Core Ideas."

Earth and Space Sciences 1 A: Earth's Place in the Universe: The Universe and its Stars.

The sun is but one of a vast number of stars in the Milky Way galaxy, which is one of a vast number of galaxies in the universe.

The universe began with a period of extreme and rapid expansion known as the Big Bang, which occurred about 13.7 billion years ago. This theory is supported by the fact that it provides explanation of observations of distant galaxies receding from our own, of the measured composition of stars and nonstellar gases, and of the maps and spectra of the primordial radiation (cosmic microwave background) that still fills the universe.

Nearly all observable matter in the universe is hydrogen or helium, which formed in the first minutes after the Big Bang. Elements other than these remnants of the Big Bang continue to form within the cores of stars. Nuclear fusion within stars produces all atomic nuclei lighter than and including iron, and the process releases the energy seen as starlight. Heavier elements are produced when certain massive stars achieve a supernova stage and explode.

Stars' radiation of visible light and other forms of energy can be measured and studied to develop explanations about the formation, age, and composition of the universe. Stars go through a sequence of developmental stages—they are formed; evolve in size, mass, and brightness; and eventually burn out. Material from earlier stars that exploded as supernovas is recycled to form younger stars and their planetary systems. The sun is a medium-sized star about halfway through its predicted life span of about 10 billion years.

Your District. In a paragraph, please describe how your school district implements the "Universe and its Stars" topics described above. For instance, in which class(es) do they appear? Are all topics generally covered?

New Directions. Afternoon activities this week partially addressed the NGSS topics.

- Tuesday: Spectroscopy
- Wednesday: Hubble Expansion
- Thursday: The Cosmic Microwave Background

We'd like to receive your input on new directions. Please choose two topics in cosmology that you believe would be well-matched (by virtue of perceived accessibility, importance, etc) to a high school audience. For each topic, offer an idea for a student activity, evidence-based if possible. Feel free to combine, divide, or create topics. Also feel free to brainstorm in teams and submit collective ideas.

1. Composition of Stars and the Interstellar Medium
2. Big Bang Nucleosynthesis
3. Stellar Nucleosynthesis
4. Dark Matter
5. Cosmic Acceleration and Dark Energy
6. Energy Budget of the Universe (Atoms, Dark Matter, Dark Energy)
7. Geometry of the Universe
8. Inflation
9. The Cosmological Principle and the Homogeneity and Isotropy of the Universe
10. Olber's Paradox (As an argument for a finite-aged universe)
11. The Age of the Universe
12. Star and Galaxy Formation
13. The Cosmic Infrared Background and Cosmological Star-Formation History
14. General Relativity, Space-Time, and Gravitational Waves