Journey Onward

It's Elemental …

Grades 9-12

How do we know what we know about the universe? How do astronomers study distant celestial objects without traveling through space for "hands-on" investigations? This interactive program answers these questions and more. Students discover how chemical compositions of far-away stars and galaxies can be determined through spectroscopy. Using diffraction glasses, which separate light into patterns specific to a particular element, they see how elemental gases such as hydrogen, helium, mercury, and argon can be identified. Students also learn about the Doppler Effect in sound and light waves, and how it is used by scientists as evidence for an expanding universe going back to the Big Bang.

Outcomes

- Students observe elemental gases through diffraction glasses and identify differences in the spectroscopic pattern of each gas.
- Students learn that light and sound travel in waves.
- Students discover how the Doppler Effect provides evidence for the Big Bang and an expanding universe.

HCPS III Benchmarks

SC.ES.8.10: Compare different theories concerning the formation of the universe.
SC.ES.1.3: Defend and support conclusions, explanations, and arguments based on logic, scientific knowledge, and evidence from data.
SC.ES.2.4: Describe technologies used to collect information about the universe.
SC.PS.6.6: Explain and provide examples of electromagnetic radiation and sound using a wave model.
SC.PS.6.12: Describe nuclear reactions and how they produce energy.

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