Educator Viewing Guide

From Earth to the Universe (2015)
30 minutes

This stunning voyage through space and time conveys, through sparkling sights and sounds, the Universe revealed to us by science. Viewers can revel in the splendor of the worlds in the Solar System and our scorching Sun. *From Earth to the Universe* takes the audience out to the colorful birthplaces and burial grounds of stars, and still further out beyond the Milky Way to the unimaginable immensity of a myriad galaxies. Along the way, the audience will learn about the history of astronomy, the invention of the telescope, and today's giant telescopes that allow us to probe ever deeper into the Universe.

Topics covered:

Celestial phenomenon, galaxies, history of astronomy, telescopes, space exploration, solar system

Interdisciplinary connections: history, geology

Key Terms and Concepts:

Comet, Craters, Galaxy, Geocentric System, Gravity, Heliocentric Model, Observational Astronomy, Red Giant, Sunspot, Solar System, Stellar Clusters, Telescope

Combine with these KidSpace Activities:

Ballistics Lab
Take aim with space-themed ball blasters, jump, and climb while exploring science concepts: forces, gravity, resistance, energy, and more.

Launch Lab
Learn the force needed to send rockets into the air. Take aim with our stomp rockets while investigating science concepts: rocket design, force, gravity, altitude, resistance, and more.

PlaySpace!
Science begins with imagination. The space-themed playground offers many opportunities for space-themed play, space-related discoveries, and demonstrations of science concepts: gravity, friction, force, laws of motion, and more.

Learning Resources and Activities:

Create learning units designed around a visit to KidSpace! These web resources and activities are designed to illustrate concepts and ideas presented in the show. Many of these can be adapted to various age groups.

From Earth to the Universe: Activity Space Travel; Chandra X-Ray Observatory NASA
This activity is designed to help learners understand and measure distances to astronomical objects from the Earth and determine travel time. Includes worksheets, flash cards, and links to resources.
http://chandra.harvard.edu/resources/handouts/constellations/activities/space_travel.pdf

Exploring the Universe: Exoplanet Transits; NISE Network
This resource contains downloads needed for participants to simulate the transit method scientists use to discover distant planets (Spanish and English available). Includes learning goals and how-to videos.
http://www.nisenet.org/catalog/exploring-universe-exoplanet-transits-2018

Do it Yourself Solar System; Universe Awareness (European Union)
This site provides directions to complete an imaginative craft activity where children make the planets of the solar system using an icosahedron template, and then decorates with art materials. Includes background information and template downloads.
http://www.unawe.org/activity/eu-unawe1328/

NASA Space Place: Classroom Activities; NASA
This resource contains several space-related activities for the classroom. Must scroll down to find link to downloadable pdf of activity. Related activities include: *Telescope as Time Machine*, *Pluto or Bust*, *Launch a Frisbee into Orbit, Design and Build Your Own Spacecraft* and more.
https://spaceplace.nasa.gov/classroom-activities/en/

Modeling the Night Sky; McDonald Observatory
This resource provides directions for a fun and interactive activity where learners explore the positions and motions of the Sun, Earth, Planets, and constellations. Includes national science standards.
https://stardate.org/sites/default/files/pdfs/teachers/ModelTheNightSky.pdf

Solar System Size Scale Model Demo; McDonald Observatory
This site is a reference sheet describing how to create a demonstration of the relative size of the planets in our solar system using common objects, such as basketballs, softballs, and marbles.
http://mcdonaldobservatory.org/sites/default/files/SolarSystemSizeScaleModelDemo.pdf

Comprehension Questions:

Help learners process the concepts and ideas presented in the show with these questions.

1. What scientific methods did ancient astronomers use to understand the universe and Earth's place in it?
2. What discoveries allowed scientists to move from a geocentric system understanding of the universe to a heliocentric model of the universe?
3. Describe the importance of the telescope in aiding our understanding of the universe.

Further Research and Discussion

Ask learners to discuss the potential timeline for sending the first humans to Mars. What do they see as the potential challenges and rewards to such a mission. Then, allow students to conduct online research to discover what leading space scientists predict related to human missions to Mars. Learners can share and discuss what they found and how their predictions are similar or different from the experts.

This show covers content that addresses Colorado Academic Standard in Science (Physical Science and Earth Systems Science). See Planetarium Show Academic Standard Chart for details by grade.