Southwestern Community College
EXPLORE YOUR PATH TO SUCCESS

Smoky Mountains STEM Collaborative

NASA Resources for 8th Grade Science classes

For NC 8th Grade Sci. Obj. - 8.P.1 Understand the properties of matter and changes that occur when matter interacts in an open and closed container.

- **Lesson Plan: Crystallization Model -** The crystal model device described here is best suited for use as a classroom demonstration. It is a vibrating platform that illustrates in two dimensions the development of crystal structure and defect formation. https://www.nasa.gov/pdf/315954main_Microgravity_Crystallization_Model.pdf This is part of the Microgravity Set of Lessons found here: https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Microgravity_Teachers_Guide.html

- **Lesson Plan: Cosmic Chemistry (An Elemental Question)** - This science module is about the characteristics of chemical elements and the processes of posing and answering questions that led to the development of the periodic table. https://genesismission.jpl.nasa.gov/educate/scimodule/indexCC-EQ.html

For NC 8th Grade Sci. Obj. - 8.P.2 Explain the environmental implications associated with the various methods of obtaining, managing and using energy resources.

- **Lesson Plan: Think Green - Utilizing Renewable Solar Energy** - Students will model solar energy inputs at different locations, analyze the cost effectiveness of installing solar panels, and determine the appropriate locations for solar panels. https://www.jpl.nasa.gov/edu/teach/activity/think-green-utilizing-renewable-solar-energy/

- **Lesson Plan: Environmental Control and Life Support Systems Water Filtration Challenge -** The challenge is to design and build a water filtration device using commonly available materials. To meet this challenge, students use an iterative repeating process as they build, test, and measure the performance of the filtration device, analyze the data collected, and use this information to work towards an improved filtration design. https://www.nasa.gov/pdf/280748main_Water_Filtration_Guide.pdf

For NC 8th Grade Sci. Obj. - 8.E.1 Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans.

- **Lesson Plan: FOLLOW THE WATER -** Students conduct experiments on osmosis, observing the effects that various amounts of salinity have on the transport of water into and out of cells. Students also explore water's movement through different soils, learning about porosity and permeability. https://www.nasa.gov/pdf/168049main_Follow_the_Water.pdf This is part of the Then & Now Jamestown Education Module found here: https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Exploration_Then_and_Now.html

- **Lesson Plan: Coastal Consequences of Sea Level Rise** - In this module, students will: Explore how a warming climate contributes to sea level rise. Examine how satellites collect sea level data. Analyze interactive data to understand the potential consequences of climate change on sea level in different parts of the world. https://mynasadata.larc.nasa.gov/lesson-plans/coastal-consequences-sea-level-rise

For NC 8th Grade Sci. Obj. - 8.E.2 Understand the history of Earth and its life forms based on evidence of change recorded in fossil records and landforms.

- **Lesson Plan: Crater Comparisons Activity -** This activity is designed to introduce students to the process of science through the completion of a structured mini-research investigation focusing on impact craters on Earth and other planetary worlds in our Solar System. https://ares.jsc.nasa.gov/interaction/eeab/crater-comparisons.html

- **Lesson Plan: Blue Marble Matches -** This activity introduces students to aspects of the atmosphere, biosphere, hydrosphere, and litho/geosphere and how they are interrelated. It is designed to promote an interest in authentic investigations of Earth using images acquired by astronauts as the hook. https://ares.jsc.nasa.gov/interaction/eeab/blue-marble-matches.html

For NC 8th Grade Sci. Obj. - 8.L.3 Understand how organisms interact with and respond to the biotic and abiotic components of their environment.

- **Lesson Plan: Field Trip to the Moon Educator Guide -** After watching the Field Trip to the Moon DVD, students continue their lunar exploration with classroom activities that investigate the moon's habitability and sustainable resources. These activities culminate with plans for the design and creation of a lunar station. https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Field_Trip_to_the_Moon_Educator_Guide.html

For NC 8th Grade Sci. Obj. - 8.L.4 Understand the evolution of organisms and landforms based on evidence, theories and processes that impact the Earth over time.

- **Lesson Plan: Exploring Meteorite Mysteries -** Students will recognize that carbonaceous chondrite meteorites contain amino acids, the first step towards living plants and animals and conduct experiments that simulate how the carbon material and water from carbonaceous chondrites may have helped early life on Earth. https://er.jsc.nasa.gov/seh/Exploring_Meteorite_Mysteries.pdf#page=133

For NC 8th Grade Sci. Obj. - 8.L.5 Understand the composition of various substances as it relates to their ability to serve as a source of energy and building materials for growth and repair of organisms.

- **Lesson Plan: Space Food & Nutrition Educator Guide -** This NASA educator guide for grades K-8 emphasize hands-on and cooperative involvement of students as they explore the unique problems of keeping astronauts happy and healthy in space. https://www.nasa.gov/pdf/143163main_Space.Food.and.Nutrition.pdf

8th Grade Videos:

- **How Plants Grow in Space: The Effects of Gravity and Light -** This NASA video segment explores how scientists study the growth of plant seeds on the space shuttle. https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/How_Plants_Grow_in_Space.html
- **Real World: Earth Systems -** Our Earth is a dynamic system with diverse subsystems that interact in complex ways. https://nasaeclips.arc.nasa.gov/video/realworld/real-world-earth-systems
- **Real World: What Is Soil Moisture? -** What is the connection between water, soil, and carbon cycles? https://nasaeclips.arc.nasa.gov/video/realworld/real-world-what-is-soil-moisture
- **Launchpad: NASA and Biosphere 2 -** Visit Biosphere 2, operated by the University of Arizona, to find out how scientists are working with NASA to discover more about the effects of global climate change could have on key biomes. Learn about the characteristics that divide Earth into unique terrestrial biomes. https://nasaeclips.arc.nasa.gov/video/launchpad/launchpad-nasa-and-biosphere-2

Other Resources:

National Space Biomedical Research Institute - This series of educational units is for use in fourth- through eighth-grade classrooms. The free guides contain activities that allow students to learn about the human body on Earth and in space. http://nsbri.org/for-students/for-students/