

NASA Resources for 7th Grade Science classes

For NC 7th Grade Sci. Obj. - 7.P.1 Understand motion, the effects of forces on motion and the graphical representations of motion.

- **Lesson Plan: International Space Station L.A.B.S.** - This Resource Guide consists of eight (8) guided educational learning activities. There are four separate modules covering Science (velocity), Technology (robotic arms), Engineering (protecting space suits), and Math (time in space). https://www.nasa.gov/pdf/626225main_ISS_LABS_Guide.pdf
- **Lesson Plan: The Case of the Challenging Flight** - The tree house detectives decide that they need to build a better plane. The tree house detectives use their skills in scientific investigation to learn about the four forces of flight and then use their newfound knowledge as they design and construct a plane. This is a series of FOUR lessons. https://guides.library.uncc.edu/ld.php?content_id=6477234

For NC 7th Grade Sci. Obj. - 7.P.2 Understand forms of energy, energy transfer and transformation and conservation in mechanical systems.

- **Lesson Plan: A Middle School Guide for Amusement Park Physics Day** - This is a middle school guide that makes the NASA connection to the rides. All of the activities are centered on preparing students to complete worksheets for specific rides. The science and mathematics teachers can prepare students to use a single method or several methods for gathering the data. In addition, the guide is geared to help plan and run a successful field trip. https://guides.library.uncc.edu/ld.php?content_id=6477239
- **Lesson Plan: Absorption and Radiation** - Spacesuits are constructed of materials with desirable thermal properties that reduce the suit's dependence on its heating and cooling system. This activity investigates the effect surface color has on heat absorption and radiation. https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Absorption_and_Radiation.html

For NC 7th Grade Sci. Obj. - 7.E.1 Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate and the effects of the atmosphere on humans.

- **Lesson Plan: Climate Change in My Backyard** - This series of four units explores 1. the Earth systems that create and affect climate including the Earth's energy balance and the greenhouse effect; 2. Difference between weather and climate; 3. How living things and ecosystems respond to and are affected by changing climates; and 4. a role-playing game where students take on the situations of people around the world who are being affected by changing climates in different ways. https://www.chicagobotanic.org/nasa/Grades_7-9_Activity_Guide
- **Lesson Plan: Modeling the Water Budget** - In this activity, students will use California precipitation totals and evapotranspiration data to calculate and graph water deficits and surpluses. These spreadsheet models will help students understand droughts and the movement of water in the water cycle. <https://www.jpl.nasa.gov/edu/teach/activity/modeling-the-water-budget/>

For NC 7th Grade Sci. Obj. - 7.L.1.4 Summarize the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, and excretion) and ways that these systems interact with each other to sustain life.

- **Lesson Plan: Bag of Bones** - Students identify the effects of decreased bone mass (osteoporosis) and describe why healthy bones are important in space and on Earth. https://www.nasa.gov/pdf/663094main_Bag_of_Bones_Activity.pdf
- **Lesson Plan: Thinking in Systems** - Students explore the characteristics of systems in terms of the human body. They then choose another system to explore and create a concept map of this system. Finally, they summarize the characteristics of a system. <http://wayback.archive-it.org/5717/20140812010758/http://astroventure.arc.nasa.gov/teachers/pdf/AV-Astronoesson-Part3.pdf>

7th Grade Videos:

- **“No Small Steps”** - This video series uses everyday language and illustrations to explain the challenges of travel to Mars and how the SLS will meet those challenges. <https://www.nasa.gov/exploration/systems/sls/no-small-steps-videos>
- **Real World: Earth Systems** - A demonstration of how mathematical modeling helps scientists in their predictions of climate, weather, and natural hazards. <https://nasaclips.arc.nasa.gov/video/realworld/real-world-earth-systems>

Other Resources:

Mission to Mars! - NASA's Journey to Mars, with a goal of sending humans to the Red Planet in the 2030s, is already well under way. All of the Mars Education Program lesson plans include elements of inquiry-based learning and are the very lessons from their educator conferences and professional development training sessions. <http://marsed.asu.edu/node/89>