

NASA Resources for 8th Grade Math classes

For NC 8th Grade Math Obj. 8.EE - Work with radicals and integer exponents. Understand the connections between proportional relationships, lines, and linear equations. Analyze and solve linear equations and pairs of simultaneous linear equations.

- **Lesson Plan: Scientists Track the Rising Tide** - In this problem set, learners will analyze a graph of global sea level change between 1880 and 2000 to answer a series of questions, including predicting future trends. Answer key is provided. This is part of Earth Math: A Brief Mathematical Guide to Earth Science and Climate Change.
<https://spacemath.gsfc.nasa.gov/SMBooks/SMEarthV2.pdf#page=68>
- **Lesson Plan: Equations with one variable** - Investigate the relationship between a galaxy's speed and its distance, which is known as Hubbel's Law.
<https://spacemath.gsfc.nasa.gov/Grade67/5Page8.pdf>

For NC 8th Grade Math Obj. 8.F - Use functions to model relationships between quantities.

- **Lesson Plan: Graphs and Functions** - Students will use simple linear functions to examine the scale of the radiation belts and the strength of Earth's magnetic field.
<https://spacemath.gsfc.nasa.gov/Modules/8Module2.html>

For NC 8th Grade Math Obj. 8.G - Understand congruence and similarity using physical models, transparencies, or geometry software. Understand and apply the Pythagorean Theorem. Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

- **Lesson Plan: When a Ruler Is Too Short** - This activity lets students measure distances in the classroom using parallax. The exercise can be done either at a high school level using trigonometric functions, or at a middle school level using simple arithmetic approximations to the trigonometric functions. A work sheet is provided for the middle-school-level activity.
https://pumas.nasa.gov/files/04_28_05_1.pdf

- **Lesson Plan: Volume of Spheres, Cylinders and Cones** - Students will use the volume formulas for spheres, cylinders and cones to measure the capacity of objects within the ISS to apply what they have learned. <https://spacemath.gsfc.nasa.gov/Modules/8Module6.html>

For NC 8th Grade Math Obj. 8.SP - Investigate patterns of association in bivariate data.

- **Lesson Plan: Data, Prediction and Linear Functions** - Students will learn about the Big Bang theory of the universe through reading a NASA press release and viewing a NASA eClips video segment. They will use simple linear equations to analyze data that reveals the expansion and early history of the universe after the Big Bang. <https://spacemath.gsfc.nasa.gov/Modules/8Module9.html>

Videos:

- **Our World: Sun's Position** - Find out more about how our sun's position in the sky changes due to Earth's rotation, revolution and tilt. <https://nasaclips.arc.nasa.gov/video/ourworld/our-world-suns-position>
- **Real World: Comet Quest** - Find out what a comet's diameter tells astronomers about the life of the comet. <https://nasaclips.arc.nasa.gov/video/realworld/real-world-comet-quest>
- **Real World: Comets - It's Done With Math** - Use angular size to see just how big this comet really is! <https://nasaclips.arc.nasa.gov/video/realworld/real-world-comets-its-done-with-math>

Other Resources:

Space Math - This website contains collections of activities with authentic glimpses of modern science and engineering issues, often involving actual research data. The problems were designed to be 'one-pagers' with a Teacher's Guide and Answer Key as a second page and are organized based on grade level, CCSS-M, and STEM Modules around a single topic. <https://spacemath.gsfc.nasa.gov/SpaceMath.html>

Year of the Solar System - This math guide offers educators and students insight into the behind-the-scenes role that mathematics plays in solar system exploration through engaging real-world problems. <https://spacemath.gsfc.nasa.gov/YOSS/YOSS.pdf>

ILabs: Interactive Excel Spreadsheets that Support Inquiry-based Learning - Each of the .xlsx files below is a ready-to-go Excel spreadsheet with interactive 'sliders' that let students experiment with a variety of mathematical models for planetary structure, heat flow and rotation among other modeled properties. <https://spacemath.gsfc.nasa.gov/ILabs.html>