

STEM Activities for Programs

Looking for activities you can implement in your afterschool program today? Say goodbye to googling or searching on Pinterest. Use the following activities to support youth in building an engineering mindset.

- [First Woman Camp Experience](#): Hands-on activities that accompany NASA's "First Woman" graphic novel series
- [James Webb Space Telescope STEM Toolkit](#): Virtual and classroom resources related to the James Webb Space Telescope.
- [Sun STEM Toolkit](#): Virtual and classroom resources related to the sun.
- [Sustainable Aviation STEM Toolkit](#): Virtual and classroom resources related to aviation.
- [NASA Coloring Pages](#): Color and learn about some faraway worlds with these coloring pages.
- [NASA for Students Grades K-4](#): Fun activities centered around all things NASA. Games, puzzles, color, and more
- [Space Place Art Challenge](#): Space Place monthly art missions. Draw, color or paint the subject of the month.
- [Climate Kids](#): Learn about weather and climate through games, activities, and videos
- [Build to Launch with LEGO Education and Artemis I](#): An interactive digital learning adventure that explores the Artemis I mission to the Moon.
- [Clean Room - Europa Clipper](#): Watch this live YouTube stream as NASA's Europa Clipper, is built and tested.
- [Learn the Phases of the Moon](#): Assemble a printable Moon Phases Calendar and Calculator.
- [Night Sky Network](#): Astronomy clubs bring the wonder of the universe to the public.

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- [NASA Space Voyagers Game](#): A strategy card game where students explore the solar system.
- [Mars Scavenger Hunt!](#): Students participate in a Martian mission by completing the Mars scavenger hunt.
- [Build a Pizza Box Solar Oven](#) - Use easily found materials to create an oven where students can cook s'mores. The activity answers the question "What has engineering got to do with me?" in a way that is fun.
- [Hands-On Math: Fraction Math Trees](#) - This fun hands-on, kinesthetic and visual approach to learning about fractions produces "math art".
- [Welcome to Space Math @ NASA](#) - A collection of math videos, books, and activities that are sorted by grade level, science topic, NASA missions, and engineering topics. All activities are based on NASA Mission and projects.
- [STEM Lessons from Space: Mathematics](#) - A collection of math and engineering activities, videos, and resources with a focus on the International Space Station.
- [The Institute of Electrical and Electronics Engineers](#) - A collection of fun and easy activities for ages 4-18 that cover a broad spectrum of activities—everything from designing devices to address climate change to coding.
- [Can Plants Stop Soil Erosion?](#) Soil erosion can cost the world billions of dollars every year by washing pollutants into our streams and rivers and by causing the loss of farmland. What can you do about this problem?
- [Build a Jumping Robot](#) Can you build a robot that hops like a frog? In this engineering project, you will learn how to build a simple robot that uses the energy stored in a stretched rubber band to jump. You will use the engineering design process to try to make your robot jump higher and farther. How far can you make it jump?
- [Gravity: It's What Keeps Us Together](#) This set of ten easy to understand activities use math to understand gravity on Earth and in space. The activities are kid-centered (for example, what would I weigh on Mars) and use math in an integrated format.

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- [3D Printing by Hand](#): Students will explore how 3D printers work. Then, working in pairs, they will use the same methods used by 3D printers to create a 3D model of an object. This comes with a video for educators and a complete lesson plan.
- [Experiment with Parachutes](#): In this aerodynamics science project, kids test whether the size of the parachute is important for slowing down the speed of the fall. They make a series of parachutes from small to large and test how quickly they fall from the same height.
- [Marble Run Kit & Caboodle Activity](#): Don't be misled by the word "kit" in the title! This activity plan uses easy to find materials to make a marble run (think marble roller coaster!). The "kit" is a complete lesson plan and video.
- [12 Great Ideas for Engineers Week](#): These quick, easy to implement, and fun activities highlight design process and engineering principles. Materials are easy to find at the grocery store or in the afterschool setting.
- [Mathematics & Probability Science Activity](#): Asked to get an estimate for the famed mathematical constant, Pi, you might do what the ancient Greeks did: Divide the circumference of a circle by its diameter. Or you can estimate Pi by a less conventional method: the random tossing of toothpicks!
- [Cutting Pi: Mathematics & Measurement Science Activity](#): Cutting string diameters from a string circumference is a physical (kinesthetic) way to divide the circumference of a circle by its diameter. No matter what circle you use, you'll be able to cut three complete diameters and have a small piece of string left over.
- [Build a Bird Nest](#): Different types of birds lay their eggs in different places. Some build tiny nests in bushes, some build enormous nests in tall trees. Some lay their eggs directly on the ground or on rocky ledges. Those that build nests use many different types of materials. In this project kids try to build their own bird nest using only natural materials that you can find outside. Birds are engineers too!
- [Explore Biodiversity Using a Homemade Bug Vacuum!](#): Kids use engineering skills to support the role of a wildlife biologist. Kids create a bubble vacuum to collect and examine the biodiversity of bugs and other small invertebrates (such as spiders, centipedes, and roly-polies) in their neighborhood using a homemade bug vacuum!

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- M&M Survival Challenge: Test how mimicry works by using M&M and Skittles candies as the prey. Hunt for the M&M animals but at the same time avoid the poisonous Skittles animals. Will the camouflaged M&M's have a better chance of survival? Learn about animal survival in a fun context.
- How Does a Wind Meter Work?: On a windy day it is hard to keep your hat on! The power of the wind can even be strong enough to power large wind turbines to make electricity! In this experiment, find out how you can make your own instrument to measure the speed and power of the wind. How does it work?
- Turn Milk into Plastic: Until about 1945, milk was commonly used to make many different plastic ornaments, including buttons, decorative buckles, beads and other jewelry, and many other items. Milk plastic (usually called casein plastic) was even used to make jewelry for Queen Mary of England! In this activity students will make their own casein plastic out of hot milk and vinegar.
- Devising an Algorithm for Solving Rubik's Cube: This activity shows youth three sets of move sequences that accomplish specific rearrangements of the cube. Is there a way to solve the cube using *only* these three move sequences?
- Can Humans Recognize ChatGPT's AI-Generated Text?: AI (artificial intelligence)-generated text is a hot topic for many reasons. Computers can now generate convincing paragraphs or even pages of text that look like they were written by a human. How do you know if a news article you are reading was written by a human or an AI? How does a teacher know if a student's essay was written by an AI? How do you know *this* text was not written by an AI? In this science project, you will conduct an experiment to see if volunteers can correctly identify whether different passages of text were written by a human or AI.