

# ComputerScience.org

## The Ultimate STEM Resource Guide for Kids

STEM for Kids: Activities, Classes, Channels, and Websites

STEM FOR MIDDLE SCHOOL KIDS

### ONLINE STEM CLASSES OR COURSES

- **STEM Village**
  - Offering full online courses in STEM subjects like matter and energy, coding, robotics, and geometry, STEM Village aims to supplement traditional education and encourage kids to pursue STEM careers. After a seven-day free trial, a subscription costs \$19.99 per month.
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- **TechGirlz**
  - A nonprofit affiliate of CompTIA, TechGirlz offers free online STEM workshops for girls in grades 6-8. The real-time workshops cover subjects like genetics, website design, app development, and programming.
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- **Boolean Girl**
  - Dedicated to inspiring girls interested in STEM, Boolean Girl offers free online coding courses, where students can create games, animations, and Minecraft levels. The site features some courses in physical computing, plus an archive of instructor-led sessions arranged by knowledge level.
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- **Kickstart Financial Literacy For Middle School Students**
- Presented by FutureSmart, this course explores math concepts through financial literacy. The free, seven-lesson program uses a story-based approach to guide kids through money matters like investing, budgeting, and career-planning.
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- **ST Math Middle School**
- Designed to enhance students' understanding of math by reinforcing classroom lessons, ST Math teaches about algebraic thinking, fractions, decimals, and geometry through interactive presentations. Families need to contact the company for pricing details.

## YOUTUBE AND OTHER STEM-FOCUSED VIDEO CHANNELS

- **STEM Education**
- A YouTube channel with a mission to engage kids -- and particularly girls -- in STEM subjects, STEM Education videos cover topics in robotics and computer science. Some videos include hands-on activities, such as creating clap-switch lights.
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- **The Slow Mo Guys**
- In a YouTube channel illustrating scientific principles through short videos, the Slow Mo Guys investigate questions about how the world works. Middle schoolers in particular may enjoy videos featuring slow-motion lessons on tranquilizer darts, Taekwondo moves, and explosions.
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- **The Coding Train**
- Using video tutorials, the Coding Train teaches coding basics, machine learning, and computer programming languages like JavaScript. While focused on coding, the YouTube channel occasionally branches into discussions of other scientific principles.

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- **SmarterEveryDay**
- With videos that run the gamut of scientific topics, the SmarterEveryDay YouTube channel features content on nuclear submarines, sea turtles, flocking birds, and disinformation on the internet.
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- **Design Squad Global on YouTube**
- Produced by the same PBS team that runs the Design Squad Global website (featured below), the YouTube channel engages kids through hands-on DIY projects, like seed-launching backpacks, backyard water tables, and water-saving toilets.
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- **Babble Dabble Do**
- A colorful YouTube channel full of DIY projects, Babble Dabble Do explores art, design, science, and engineering for kids. Videos include baking soda rockets, invisible ink, and lava lamps.
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- **PBS Idea Channel**
- Updates ended two years ago, but the archive remains a treasure trove for kids who want to make connections between pop culture, technology, and art. Fun videos address popular topics like fidget spinners, Nintendo games, and telekinetics.

## STEM ACTIVITIES, KITS, AND GAMES

- **STEM-Works**
- Separated into categories like crime scene investigation, medical innovations, robotics, and space, STEM-Works provides activities, articles, and explanations of cool STEM-related careers. Kids can build an Alka Seltzer rocket, code an app, and learn about performing surgery.

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• **Scratch**

• Developed by the MIT Media Lab, Scratch teaches students to create games, animations, and interactive media. Featuring a strong community of learners, the site encourages students to apply these skills across various academic subject areas.

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• **Algebra Touch**

• Students can use the app to reinforce and improve their understanding of algebraic processes. Algebra Touch focuses on the process of completing an equation rather than the final answer. The app is available for \$2.99 for iOS and Apps for Windows.

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• **Code Monster**

• Code Monster provides an immersive, hands-on introduction to coding. By following simple instructions, kids can play around with lines of code and experiment with making changes. Though simple to start and 100% free, the site doesn't offer much in the way of tutorials or assistance.

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• **Stop Disasters!**

• Developed by the UN Office for Disaster Risk Reduction, the Stop Disasters! game explores real disaster scenarios through digital simulations. Students build hospitals, schools, and housing to protect against tsunamis, wildfires, and earthquakes.

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• **Museum of Science and Industry Chicago's Science at Home**

• Students can follow video tutorials to engage in fun hands-on activities like making clouds in bottles, studying static cling, and creating an egg carton nursery. The site also includes science-based games and videos.

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- **GameBlox**
- Using block-based programming, kids can build upon existing games or start from scratch to program their own. GameBlox games run on the website or mobile devices.
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- **Gamestar Mechanic**
- Kids create their own video games through game-based quests, courses, and community participation. Games and courses are available for a la carte prices.

## STEM CONTESTS

- **NSBE Jr. Technical Innovations Competition - Middle School**
- In this national challenge for young members of the National Society of Black Engineers pre-college program, students compete by presenting science fair-style projects at the annual conference.
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- **Purple Comet Math Meet - Middle School**
- Working in teams, middle school students participate in the free online competition by solving 20 math problems in 60 minutes. Teams can enter in small, large, mixed, and noncompetitive categories.
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- **eCybermission**
- Students in grades 6-9 select a mission challenge in areas like energy, environment, food, and robotics. Working in teams, they address a specific community problem in their category, engineer a solution, and submit their findings to a panel of judges.
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- **National Science Bee - Middle School Division**
- Students compete for cash prizes by answering questions in biology, chemistry, astronomy, computer science, and other STEM-related subjects.
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- **MATHCOUNTS**
- Math enthusiasts can compete in four rounds with the MATHCOUNTS contest series: a sprint round where they solve 30 math questions in 40 minutes, a problem-solving target round, a team round, and a countdown round. In the countdown round, students get 45 seconds to answer each question.
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- **Future City**
- Middle schoolers design futuristic cities addressing an issue of sustainability in this team-based competition. The contest includes an essay, a scaled model, a project plan, and a presentation.

## STEM WEBSITES

- **Engineer Girl**
- An empowering site for girls interested in STEM, Engineer Girl provides career and college resources, interviews with female engineers in various fields, and opportunities to "ask an engineer." The site also includes a section with hands-on design challenges.
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- **Design Squad Global**
- Presented by PBS Kids, this colorful website offers catchy videos to stoke kids' interest in science. Students can learn more through games, design challenges, and fun DIY science projects.
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- **Ask Dr. Universe**

- Run by Washington State University, the website answers questions that kids ask about science. Expert-vetted responses address questions about microbes, plankton, batteries, and phobias. The site also includes videos and activities.

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- **Science Splash**

- Middle school kids interested in STEM careers can access videos from the 2005 Science Splash convention, where girls ages 10-14 hear in-person talks from women in chemistry, engineering, piloting, and more.

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- **Science Bob**

- This visually appealing site features fun videos, science fair project ideas, and experiments to try at home. Kids can participate in a science Q&A and follow the experiment blog for even more ideas.

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- **Chi Alpha Mu**

- The junior affiliate of Mu Alpha Theta, Chi Alpha Mu is a mathematics club with a website full of games and resources for math enthusiasts. Kids can also find grants, merchandise, and membership information.

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- **Amazing Space**

- On Amazing Space, kids can explore articles around space-related topics like stars and stellar evolution, the solar system, black holes, and space telescopes.