

Promoting STEM Education at Home

Resources and Ideas

Websites – Elementary Level (& Up):

Exploratorium - <http://www.exploratorium.edu/explore>

- This website is sponsored by the Exploratorium Museum in San Francisco. It provides links to lessons, websites, activities, videos and apps for all areas of science.
- Some favorites are:
 - o **“Structures around the World”** -activities for exploring different types of bridge building, using all different types of materials
 - o **“Geometry Playground”** – activities for exploring “visual math” in real-life applications, as well as how math and science build upon each other
 - o **“After School Activities”** – activities for “build it yourself” projects such as bottle rockets, cup speakers, water bottle membranophone, etc. - each have step by step written and video directions, along with video and concept maps of the STEM behind each invention!

Design Squad - <http://pbskids.org/designsquad/> - Amazing site for science and engineering for the elementary level. Videos and activities for building structures and machines that solve everyday problems or are just cool! Activities are hands-on challenges that focus on the engineering design process. They use simple materials, allow for multiple solutions, and are ideal for ages 9-12. The projects incorporate all types of science. The home page is for kids – click on the parent and teachers links for more resources for adults.

NASA - www.nasa.gov - This site explores many aspects of space travel. Feature STEM project is the Exploration Design Challenge! Students will study the effects of radiation on human space travelers and analyze different materials that simulate space radiation shielding for Orion. After participating in activities guided by their teachers, students will recommend materials that best block harmful radiation. Features a wonderful “Elementary School Design Packet” that can be used for any design/invention project

(Engineering, Go For It!) American Society for Engineering Education

<http://www.egfi-k12.org> - Great interactive site explaining and showcasing all of the different types of engineering jobs – biomedical, agricultural, architectural, mechanical, environmental, electrical, civil, chemical, etc. Activities and a downloadable magazine are featured.

Stem Challenge - www.stemchallenge.org - Students learn about and create their own video games. Encourage your children to create the games instead of just playing them. They will learn about technology, problem-solving, and will be promoting creativity rather than just playing games.

PBS Learning Media - <http://www.pbslearningmedia.org> - Tons of activities, lessons, multimedia links and videos for each stem component, organized by topic (854 links for engineering, 613 links for Systems and Technologies, for example)

The Secret Life of Scientists and Engineers.

<http://www.pbs.org/wgbh/nova/secretlife/> - Fun PBS site highlighting the real lives of real scientists.

NOVA - <http://www.pbs.org/wgbh/nova/> - This provides videos and interactive activities and information about science.

FIRST (For Inspiration and Recognition of Science and Technology)-

<http://www.usfirst.org> - nonprofit organization centered on promoting STEM education and values. Has links to team engineering challenges

Computer Science Unplugged- <http://csunplugged.org> - Great site for learning about computer science without the need for a computer. The activities bring the science of computers into hands-on activities

Also - <http://www.ncwit.org/resources/computer-science-box-unplug-your-curriculum>

Kitchen Pantry Scientist - <http://kitchenpantryscientist.com> - cute site for easy, fun science activities you can do with little ones

Great Achievements - www.greatachievements.org - website that documents the history of the greatest inventions including when, why, and how they came to be.

How Stuff Works - www.HowStuffWorks.com - explains thousands of topics, from engines to lock-picking to ESP , with video and illustrations so you can learn how everything **works**.

How It Works - <http://www.popsci.com/category/tags/how-it-works> - Sponsored by Popular Science, this website also looks at thousands of technologies and explores their inner workings.

Websites - Middle/High School:

Siemens STEM Academy - <http://www.siemensstemacademy.com> - Siemens has been a great local partner in STEM education. Their website includes **great resources for educators and parents.**

National STEM Video Game Challenge:

This program invites students in grades 5 – 12 to design games that incorporate STEM content or STEM themes in innovative and engaging ways.

www.stemchallenge.org

Engineer Girl

This site was designed to introduce girls in **grades 5 - 8** to the exciting opportunities that engineering represents for girls and women.

www.engineergirl.org

Engineer Your Life

This site was designed to introduce girls in **grades 9-12** to young women engineers and highlight careers. A section for parents and counselors furnishes background in engineering to better advise students.

www.engineeryourlife.org

Engineering Interact

This site provides students with opportunities to learn about engineering concepts by playing different Interactive games. Topics include light, sound, forces & motion, Earth & Beyond, and Electricity.

www.engineeringinteract.org

Discover Engineering

This site contains a variety of games, videos, and general information about various engineering careers.

www.discoverengineering.org

Try Engineering

This site contains several engineering games that provide students with opportunities to use the problem solving skills engineers employ every day. Student can choose from four different games including a bionic arm design challenge.

www.tryengineering.org

Build It & Bust It-

This is a site FOR engineering. Students can design and test their own structures and share what they learn with others. They can also view the designs of other students.

www.thinkquest.org

Local Experiences:

Engineering for Kids (Edison) – offers after-school and Saturday programs at reasonable prices – students engage in robotics challenges and engineering programs – 3 levels for 4-6 years, 7-11 years, 12-16 years

Museums:

Liberty Science Center (Jersey City, NJ)
Museum of Math (MoMath) (Manhattan)
Intrepid Sea, Air & Space Museum (Manhattan)
Museum of Natural History (Manhattan)
The Brooklyn Children's Museum (Brooklyn, NY)
The Academy of Natural Sciences (Philadelphia, PA)
The Franklin Institute (Philadelphia, PA)
The Newark Museum (Newark, NJ)
Bergen Museum of Arts and Sciences (Hackensack, NJ)
The Staten Island Museum (Staten Island, NY)

Television Shows:

MythBusters – Discovery Channel
Unchained Reaction – Discovery Channel
How the Universe Works – Discovery (DVD)
Through the Wormhole – Discover (DVD)
Cupcake Wars (Food Network)
Cake Boss (TLC)
Shark Tank (ABC)
Bones (FOX)
CSI (CBS)
NUMB3RS (CBS)
NCIS (CBS)
Heroes (NBC)
Robot Wars (available on YouTube)
Battle Bots (available on YouTube)

For the younger kids:

Cyberchase

<http://pbskids.org/cyberchase/>

This award-winning series features exciting adventures that teach core math and science concepts. The Super Cyberchase Science theme page highlights resources that promote math and science connections, and The Inventor's Workshop game introduces students to basic principles of physics and engineering.

Fetch! With Ruff Ruffman

<http://pbskids.org/fetch/> -This reality series for kids presents a variety of challenges that participants must solve collaboratively using their science knowhow. The site offers fun games and activities that test and expand users' science knowledge.

DragonflyTV

<http://pbskids.org/dragonflytv/> -This program provides children with opportunities to explore science and engineering to share the excitement of scientific discovery. The Web site includes a wealth of science- related games, activities, and streaming video.

EekoWorld

<http://pbskids.org/eeoworld/>

This site teaches children about environmental science and includes two immersive interactive games as well as lesson plans for grades K-4.

SciGirls

<http://pbskids.org/scigirls>

SciGirls is out to change how tweens think about science, technology, engineering and math, or STEM! In each episode, join bright, curious *real* girls in putting STEM to work. Then check out the website to play games, watch episodes, share projects, and connect with other SciGirls in a totally safe social networking environment!

ZOOM

<http://pbskids.org/zoom>

This program and site promote activity-based learning about science and engineering. The site offers a wide variety of games and activities to enhance children's knowledge and enthusiasm about science.

QUEST

<http://science.kqed.org/quest/>

Inspire students with stories that demonstrate science in the real world, from energy- saving windows to the science of cheese. KQED's award-winning multimedia science and environment series *QUEST* aims to raise science literacy and inspire audiences to discover and explore science and environment issues for themselves. The series focuses on nine content areas: astronomy, biology, chemistry, climate, engineering, environment, geology, health, and physics.

For preschoolers/early childhood -Sid the Science Kid -

<http://www.pbs.org/parents/sid/>

Each episode of "Sid the Science Kid" focuses on a single scientific concept that is presented using Preschool Pathways to Science (PrePS©), a practical science readiness curriculum used in preschool classrooms that was created by cognitive researchers and preschool educators, incorporating lessons learned from developmental research as well as classroom experience.