Technology & Engineering and STEM Resources

These resources focus on Technology & Engineering and STEM Education. Some resources listed here are instructional and can be utilized directly with students, while others are meant to assist teachers in preparing for delivering instruction. Some links lead to additional lists of resources curated by professionals in the field.

If you have any questions about these or other resources, contact Brandt Hutzel at brhutzel@pa.gov.

Elementary Online Resources

3Dux Design (K-6)
The STEM show offers projects focused on simple machines, teaching, designing and creating.

CyberPatriot Elementary School Cyber Education Initiative(K-6)
This set of three interactive learning modules is designed to increase the awareness of online safety and cybersecurity principles with supplemental activities.

Engineering is Elementary (K-6)
Engineering is Elementary is a free curriculum for families to use at home.

STEM Is Elementary(K-6)
Collection of resources, lesson plans, and activities that may support learning at home.

PTO Today (K-8)
Family Science Night: 20+ STEM Activities To Spark Imagination with our free Family Science Night planning kit, your group can help families experience science, technology, engineering, and math outside the classroom with hands-on, cross-generational stem activities. The kit has more than 20 easy-to-follow activities.

Scratch (K-8)
A free programming language and online community where you can create your own interactive stories, games, and animations.

K-12 Online Resources

Penn State Science-U @ home
Everyday experiments and lessons to do at home.

[Rube Goldberg Bar of Soap Video Challenge](#)
Rube Goldberg Bar of Soap Video Challenge sponsored by NRG.

[Code.org](#)
Free curriculum for K-12 computer science

[Discover E](#)
Free STEM resources gathered from around the web. Resources are filtered by category. Digital library comprised of standards-based curricula for K-12.

[Engineering, Go for It!](#)
Free STEM resources gathered from around the web. Resources are filtered by category. Digital library comprised of standards-based curricula for

[Flux Online STEM Challenges](#)
Daily STEAM challenges that families can complete and share to win prizes.

[ITEEA IdeaGarden](#)
An educator-to-educator network where teachers share resources, ideas, and solutions for teachers of Integrative STEM.

[NASA STEM Resources for K-12 Educators](#)
NASA.gov serves as the gateway for information on missions, research, programs and services offered by NASA. The educational sections provide educators and students access to materials and resources produced through collaborations with NASA's mission directorates.

[PA STEM Toolkit](#)
Integrated K-12 STEM lessons that are coherent with the Pennsylvania Department of Education's vision, mission, and belief structure for STEM Education.

[Pitsco STEM at Home](#)
Collection of free STEM activities and publications for families to use at home.

[STEMfinity](#)
Free STEM resources gathered from around the web. Resources are filtered by category. Digital library comprised of standards-based curricula for K-12.

[Teach Engineering](#)
Free STEM resources gathered from around the web. Resources are filtered by category. Digital library is comprised of standards-based curricula for K-12.

[Girls Who Code](#)   (3-12)
Free weekly activities--some online, some offline--as virtual curricula.

Secondary Online Resources

Verizon Innovation Learning Teacher/Parent Portal (5-9)
Offers free activities at home for grades 5-9. The portal offers lesson plans and student guidelines to support a variety of fun activities.

The Ruler Game (6-8)
Interactive measuring game

Amazon Future Engineer (6-12)
Free access to computer science courses in the United States, intended for independent learners in grades 6-12 and teachers who are remotely teaching this age group.

Animated Engines (6-12)
Animated illustrations that explain the inner workings of a variety of steam, Stirling, and internal combustion engines.

AutoDesk (6-12)
CAD software including AutoCAD, Revit, 3DS Max, Inventor, etc. available for free to educators and students.

Bridge Designer 6-12
Bridge designer simulates real life civil engineering challenges in the design and construction of a bridge available for free to students and educators.

Paper Roller Coasters (6-12)
Project to reinforce Newton's Laws of Motion through roller coaster physics. The objective is to have a marble take the GREATEST amount of time to get from the top of the first hill to where the coaster ends.

Sketchup (6-12)
3D modeling program available for free to students and educators.

STEM Works (6-12)
Free STEM resources gathered from around the web. Resources are filtered by category. Digital library comprised of standards-based curricula for K-12.

Stop-Motion Animation Video (6-12)
A project where an object is moved a tiny bit and a photo is snapped. Repeat this process twenty to ten thousand times, play back the sequence in rapid progression, and the object appears to move fluidly across the screen.

TechDirections   (6-12)

A magazine and website for technology, CTE and engineering technology with engaging student activities.

[The Big Book of STEM Classroom Challenges - Book 1](#)   (6-12)
The Big Book of STEM Classroom Challenges includes 100+ activities for classrooms and students project teams.

[The Big Book of STEM Classroom Challenges - Book 2](#) (6-12)
The Big Book of STEM Classroom Challenges includes 125+ activities for classrooms and students project teams.

[The Science Spot](#) (6-12)
Junk Box Wars is a collection of ready-to-use STEM projects and challenges for students.

[TinkerCAD](#) (6-12)
Free download of a simple 3D CAD program available for free to students and educators.

[TRAILS (Teachers and Researchers Advancing Integrated Lessons in STEM) (6-12)](#)
Lesson plans include handouts, step-by step tutorials, and video training sessions.

[Whitebox Learning](#) (6-12)
Integrated-STEM Learning system STEM Applications include [Dragster 2.0](#), [Gliders 2.0](#), [Structures 2.0](#), [Green Car 2.0](#), [Rockets 2.0](#), [Mousetrap Car 2.0](#), [Prosthetics 2.0](#), [Rover 2.0](#), [Survival Shelter 2.0](#), [KidWind 2.0](#), [Solar](#), and [Drone](#). Students can compete virtually, from any browser. Free for use until end of June.

[CMU CS Academy](#) (8-12)
A novel, world-class, online, interactive high school computer science curriculum that is entirely free.

[Audacity](#) (9-12)
Audacity is an easy-to-use, multi-track audio editor and recorder for Windows, Mac OS X, GNU/Linux and other operating systems

[Blender](#) (9-12)
Free and open source 3D creation suite that supports modeling, rigging, animation, simulation, rendering, compositing, motion tracking, video editing and game creation.

[Home By Me](#) (9-12)
A free web 2.0 architectural design CAD program.

[Khan Academy Imagineering](#) (9-12)
Imagineering in a Box is designed to pull back the curtain to show how artists, designers and engineers work together to create theme parks. Go behind the scenes with Disney Imagineers and complete project-based exercises to design a theme park of your very own.

Professional Development

[Pop-Up Professional Learning](#)
TransformED (at AIU3) hosts a daily 45-minute professional learning experience at 11:00 am and 3:00 pm.