



The following resources are related to the [Advance CTE Career Cluster](#). This Cluster covers careers in engineering, research and development, automation and artificial intelligence, equipment maintenance, safety protocols, and quality control.

A Possible Futures—Engineering and Design arizonafuture.org/programs/
(Grades 6-10) Free engineering lessons aligned to Arizona Career Literacy standards.

ADE STEM Standards and Resources [ADE Science](#)
(Grades K-12) Curricular resources and professional learning opportunities.

Advance Manufacturing Career Cluster Information [Advance CTE](#)
(Grades 7-12) Key skills and national job outlook, salary, emerging occupations, and required education and certifications.

AZ PBS Careers in Engineering engineering--technology/careers
(Grades 5-8) Free resources to guide students to explore careers in engineering.

AZ PBS Learning-Manufacturing Process factories2/manufacturing
(Grades 5-8) The manufacturing process involves taking raw materials through a variety of steps to produce a finished product.

AZ PBS What is a Semiconductor? az.pbslearningmedia.org/resource
(Grades 5-8) Semiconductors are in everything from your cell phone to rockets. But what exactly are they, and what makes them so special?

Engineering Design Process teachengineering.org
(Grades K-8) This process emphasizes open-ended problem-solving and encourages learning from failure.

Engineering for Kids engineeringforkids.com/
(Grades K-8) Accredited, interactive engineering programs.

EVERFI Endeavor endeavor-stem-activities
(Grades 6-8) Career exploration projects in game design, prototype design, and data-related challenges.

First Robotics firstinspires.org/robotics
(Grades 4-12) Robotics is a perfect STEM lesson as it encompasses all skills.

Global Foundries Semiconductor Resources
(Grades 3-8) Free, fun, and engaging hands-on activities educate students about semiconductor concepts.

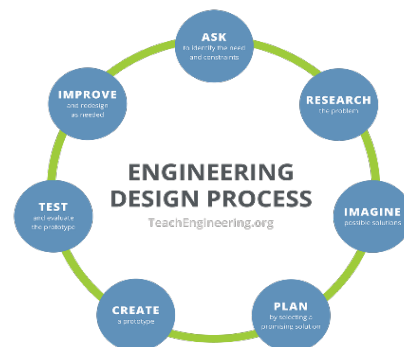
Henry Ford Museum-Invention Convention curriculum-resources/invention-convention
(Grades K-12) Free curriculum to activate students' critical thinking and the impact of inventions in their lives. Students apply invention and entrepreneurial skills to build real-world solutions.

Hour of Engineering by Siemens Hour of Engineering
(Grades 6-8) Discover the world of engineering and explore design challenges.

International Technology and Engineering Educators Association [ITEEA](#)
(Grades 6-8) Free classroom resources on engineering concepts.

Lego Education teach.legoeducation.com
(Grades K-8) Engineering lessons with science applications.

Manufacturing Institute themanufacturinginstitute.org/students/
(Grades 7-12) Manufacturing resources for students - [manufacturing coloring pages](#)



Micron Educator Hub micron.com/intro-to-memory

(Grades 5-12) Free engineering and fabrication lessons, videos, and activities.

My American Farm games/subjects/engineering

(Grades K-5) Fun, educational games created by the American Farm Bureau.

PBS Learning- Engineering Systems engineering-systems-processes

(Grades 6-8) Free robotics lessons based on national science standards.

Project Lead the Way Automation and Robotics pltw.org/curriculum

(Grades 6-8) Combine mechanisms with automation and solve real-life problems of mechanical and electrical engineers, and software developers.

Rube Goldberg Machine- Teach Engineering simp_machines_lesson05_activity1

(Grades 5-12) Open-ended, hands-on, fun challenge employs the engineering design process. Develops student creativity and problem-solving skills.

SAM Labs samlabs.com

(Grades K-8) Purchase the hands-on coding and engineering lessons where students design, build, and test real-world solutions using Bluetooth-connected blocks and drag-and-drop coding.

Science Buddies–Build a Prosthetic Hand science-fair-projects science-fair-projects

(Grades 5-8) Practice material resourcing and the manufacturing assembly process.



Sand to Silicon [Activity Book](https://ActivityBook)

(Grades 6-12) Free student friendly activity book created by NXP Semiconductors to describe how Integrated Circuits (IC) are made.

Semiconductor Adventure [Semi Foundation Activity](https://SemiFoundationActivity)

(Grades 6-12) Free student friendly activity to learn about semiconductors.

Semiconductor Teacher Resources Semi-Foundation

(Grades 2-12) Free semiconductor classroom resources created by teachers for teachers.

Solve It Challenges schoolsup.org/solveit

(Grades 6-12) Free real-world challenges using the Engineering Design Process.

Start-Up STEM startupstemllc.net/

(Grades K-5) Hands-on teacher PD for elementary educators to learn how to write STEM lessons and build a STEM community.

STEM Activities- Science Buddies stem-activities/

(Grades 5-8) Free real-world challenges using the Engineering Design Process.

Teach STEM Explorers- AZ Educational Foundation Teachstem

(Grades 5-8) Free lessons on engineering design processes and inventions.

TryEngineering (IEEE) tryengineering.org/explore-resources

(Grades 5-8) Free computer science, binary basics, AI, and machine learning resources.



ZSpace Franklin's Lab and Newton's Park zspace.com/solutions/stem

(Grades K-8) Virtual platform for elementary students to learn how to build electrical circuits.



It is rocket science