TEACHENGINEERING.ORG

Ignite K-12 STEM Learning with Free, Hands-On Design Activities

U.S. National Science Foundation

Engineering & Applied Science
UNIVERSITY OF COLORADO BOULDER

Teaching Engineering Webinar
Feb 4, 2026

Design Challenge!

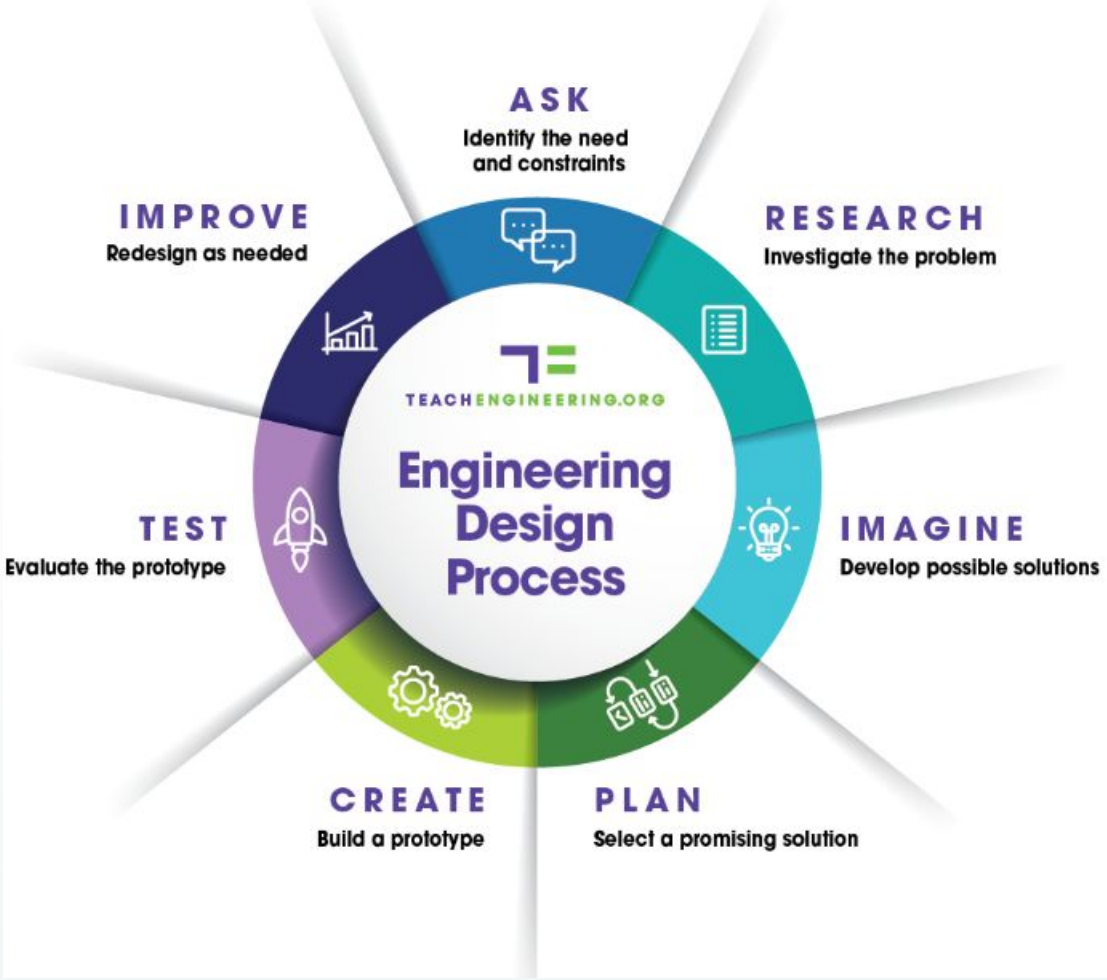
Create a prototype of sound canceling headphones to reduce the level of noise to protect hearing.

Images: https://www.noisyplanet.nidcd.nih.gov/have-you-heard/musicians-face-higher-risk-of-hearing-loss

Design Challenge
Rapid Prototyping

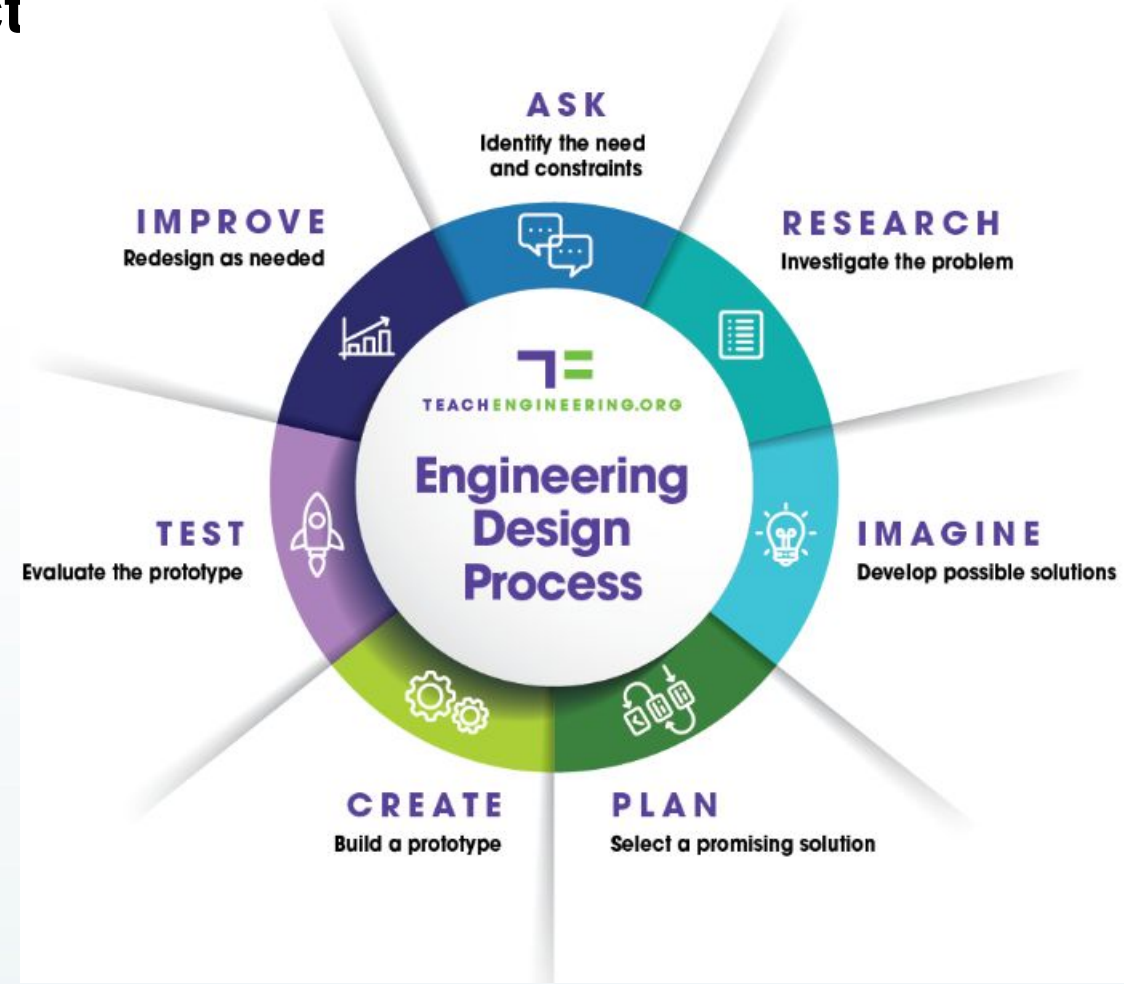
- *Goal*: Design-build-test a prototype model for sound cancelling headphones

- *Constraints* (limits):
  - Whatever materials you have on hand! (e.g, LEGOs, household & office materials, recycling etc.)
  - 6 minutes: 2 minutes to plan and 4 minutes to create and test your prototype!



Create a prototype of sound canceling headphones to reduce the level of noise to protect

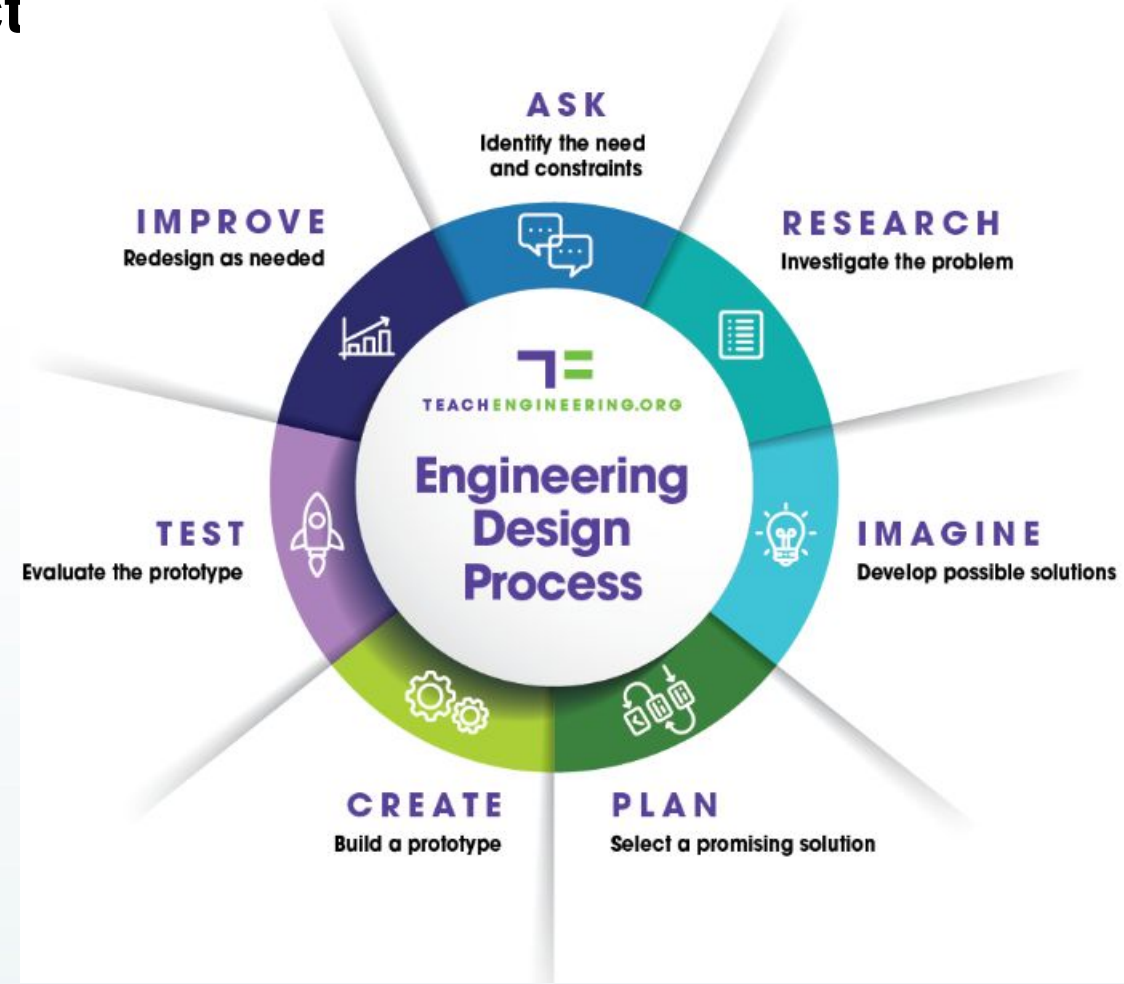
- ***Imagine and Plan:*** Brainstorm possible solutions and select the most promising one.



Create a prototype of sound canceling headphones to reduce the level of noise to protect

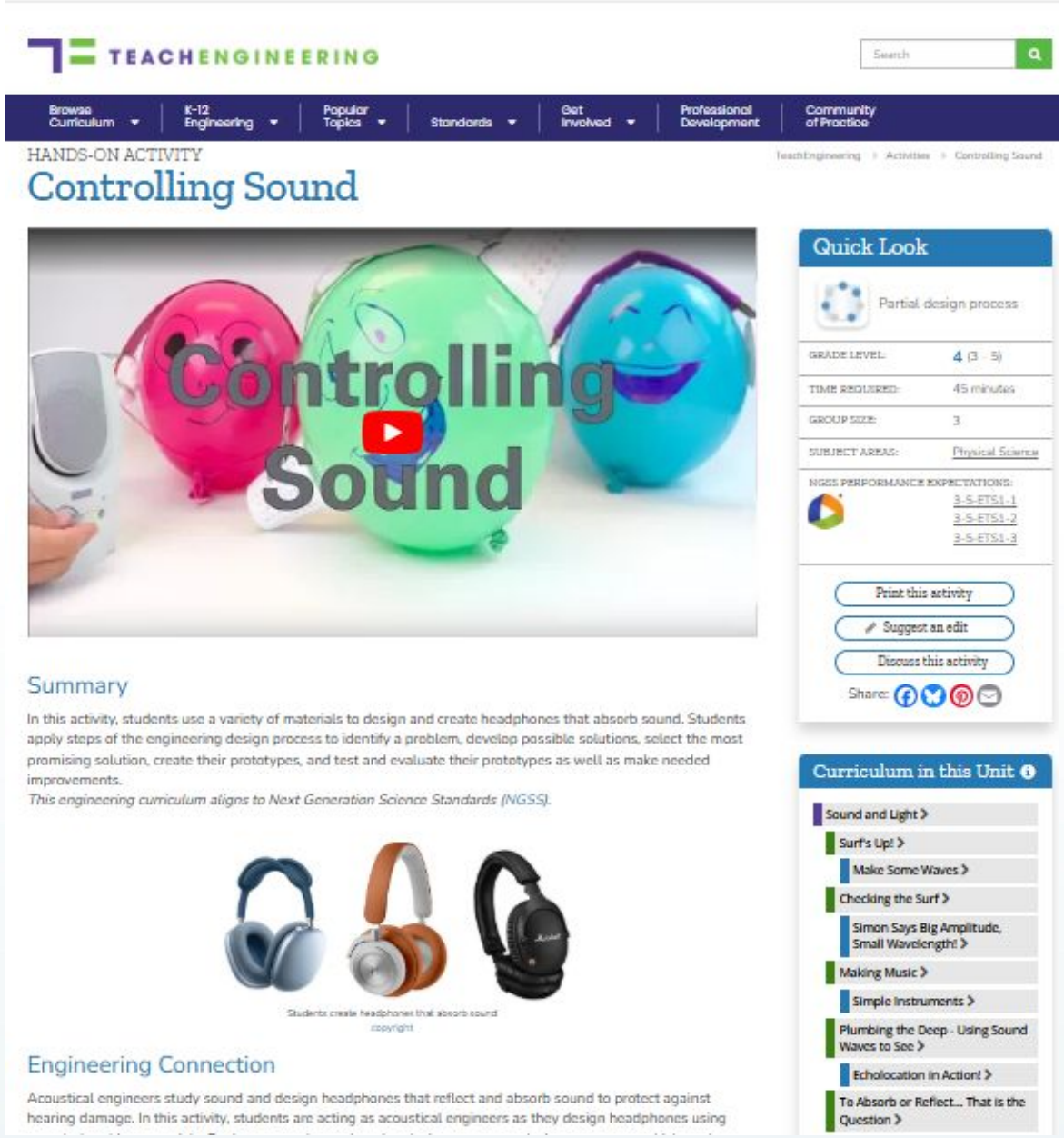
In 4 minutes:

- ***Create and Test:*** Build your prototype out of whatever materials around you. Get creative!



Share Out

- Share your designs!
- What materials did you use?
- How would you improve your designs?



https://www.teachengineering.org/activities/view/cub_soundandlight_lesson5_activity1

What is Teach Engineering?

Teach Engineering is a FREE digital library of **classroom-tested, standards-aligned** K-12 STEM resources created in collaboration with educators across the nation.

Our goal is to **help educators put the ‘E’ in STEM** by making applied science, technology, and math come alive through engineering design and design thinking.

Teach Engineering K-12 STEM Digital Library

Accessible

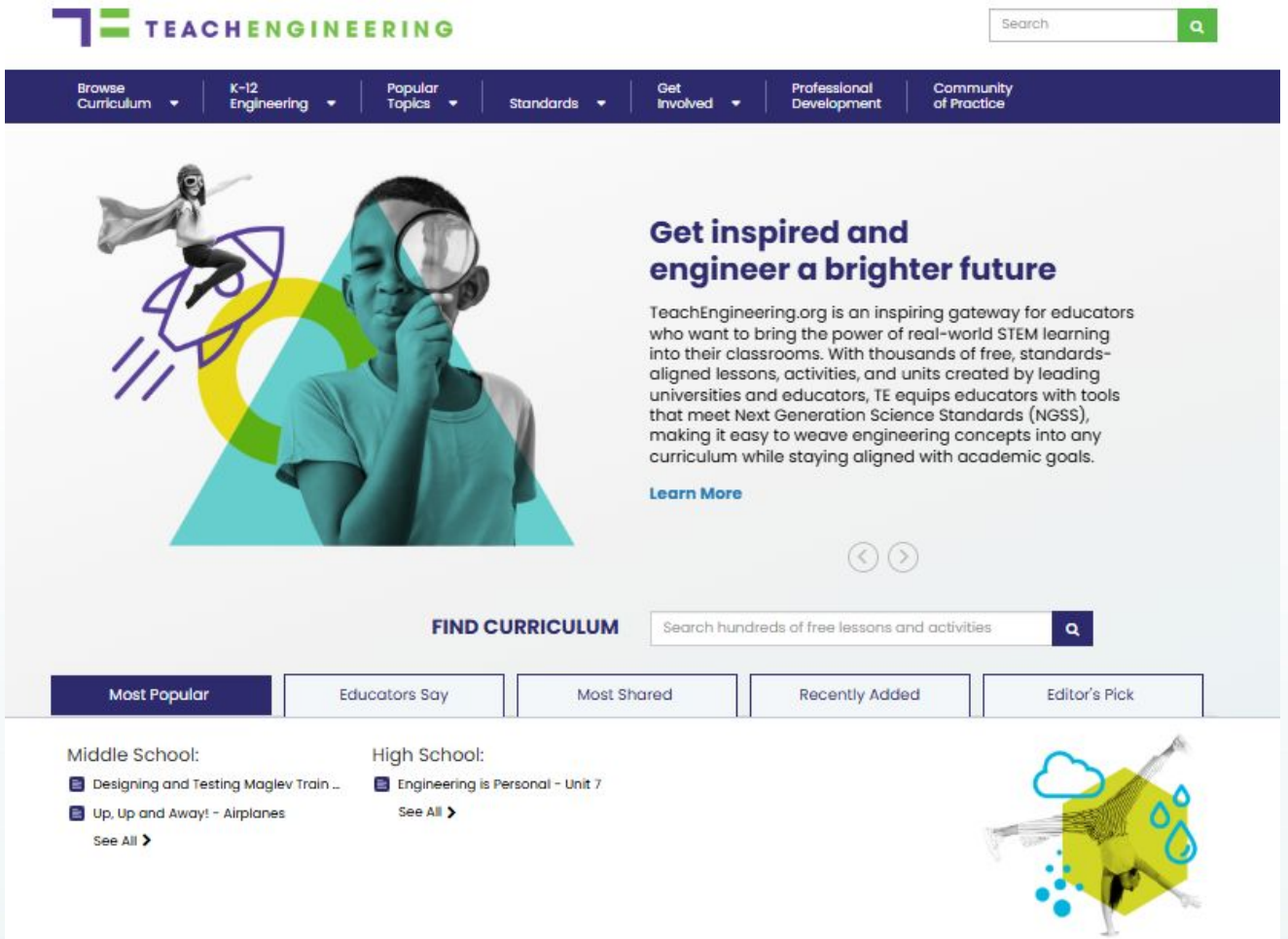
FREE collection of educational resources that uses **low-cost**, readily available materials.

Comprehensive

Over **2000 hands-on** activities, lessons, informal engineering activities, and maker challenges.

Teacher-tested; peer-reviewed

Resources have been **classroom tested** & reviewed by external educators and engineers.



Teach Engineering K-12 STEM Digital Library

Standards-Aligned

National and State Standards, including STEL, NGSS and others.

Turn Key

Full lesson details provided including learning objectives, materials lists, procedure, assessments, worksheets, rubrics and more!

Original How-To Videos

Helps teachers visualize how to execute engaging, hands-on activities in the classroom.

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Engineering & Engineering Design Resources

TEACHENGINEERING

Search

Browse Curriculum | K-12 Engineering | Popular Topics | Standards | Get Involved | Professional Development | Community of Practice

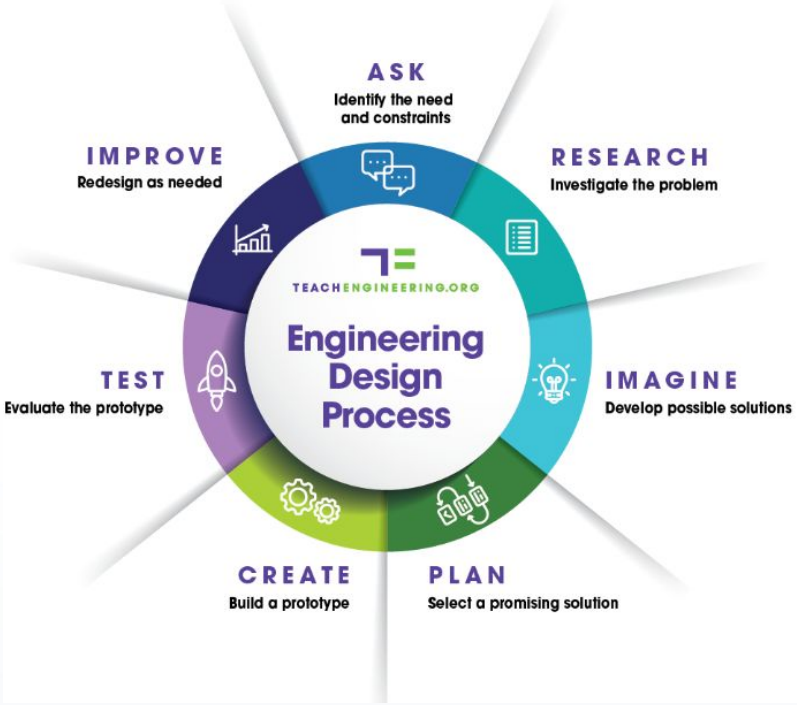
THE ENGINEERING DESIGN PROCESS

emphasizes open-ended problem solving and encourages students to learn from failure.

This process nurtures students' abilities to create innovative solutions to challenges in any subject!

The **engineering design process** is a series of steps that guides engineering teams as we solve problems. The design process is **iterative**, meaning that we repeat the steps as many times as needed, making improvements along the way as we **learn from failure** and uncover new design possibilities to arrive at great solutions.

Overarching themes of the engineering design process are **teamwork** and **design**. Strengthen your students' understanding of open-ended design as you encourage them to work together to brainstorm new ideas, apply science and math concepts, test prototypes and analyze data—and aim for creativity and practicality in their solutions. **Project-based learning engages learners of all ages—and fosters STEM literacy.**



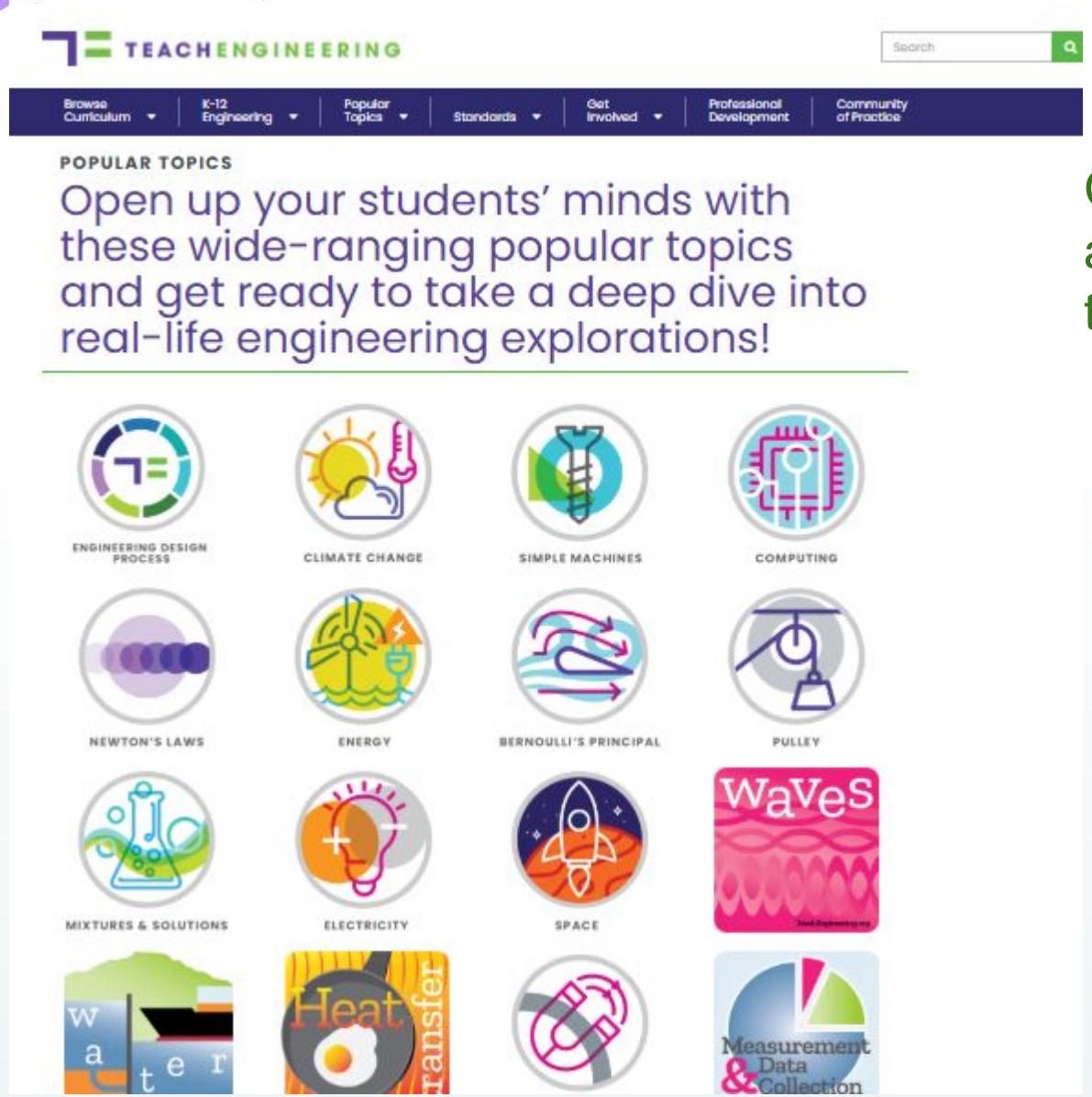
DESIGN THINKING

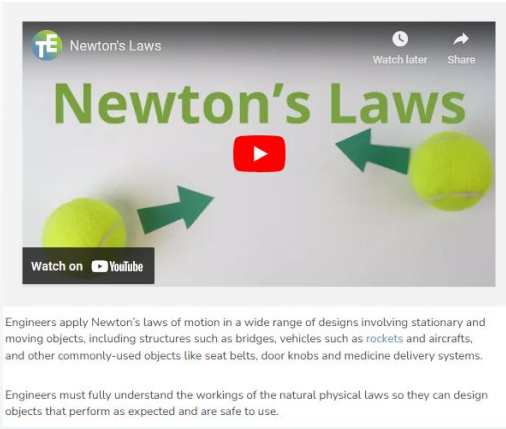
Engineers use design thinking to creatively problem solve and innovate throughout the engineering design process.

Design thinking is a way of looking at and tackling real world problems that we experience in our everyday lives, and greatly need solutions for – especially the "wicked problems" that are not well defined or have clear answers, such as climate change.

Curated Popular Topic Resources

Curated hands-on K-12 STEM activities for educators' most popular topics.





Engineers apply Newton's laws of motion in a wide range of designs involving stationary and moving objects, including structures such as bridges, vehicles such as rockets and aircrafts, and other commonly-used objects like seat belts, door knobs and medicine delivery systems.

Engineers must fully understand the workings of the natural physical laws so they can design objects that perform as expected and are safe to use.

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Types of Engineering

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Professional Development

Ready-made Webinars

Get a high-level overview of Teach Engineering. This is a great opportunity to learn more about the program and explore areas of interest, including how to engage students in engineering and engineering design thinking.

Customizable Workshops

Explore the engineering design process and enhance your classroom with the Teach Engineering collection. Experience hands-on examples of our exemplar activities that utilize everyday materials. These offerings can be customized based on your interests, needs, and grade band. Various formats are available including in-person, virtual, and asynchronous delivery.

Teach Engineering Champions Institute

The Teach Engineering Champions Institute (TECI) is a 2-day, immersive program that blends hands-on exploration, collaboration, and reflection to create a dynamic professional learning experience.

Application for 2026 open now through March 15

Champions Institute - Teach Engineering

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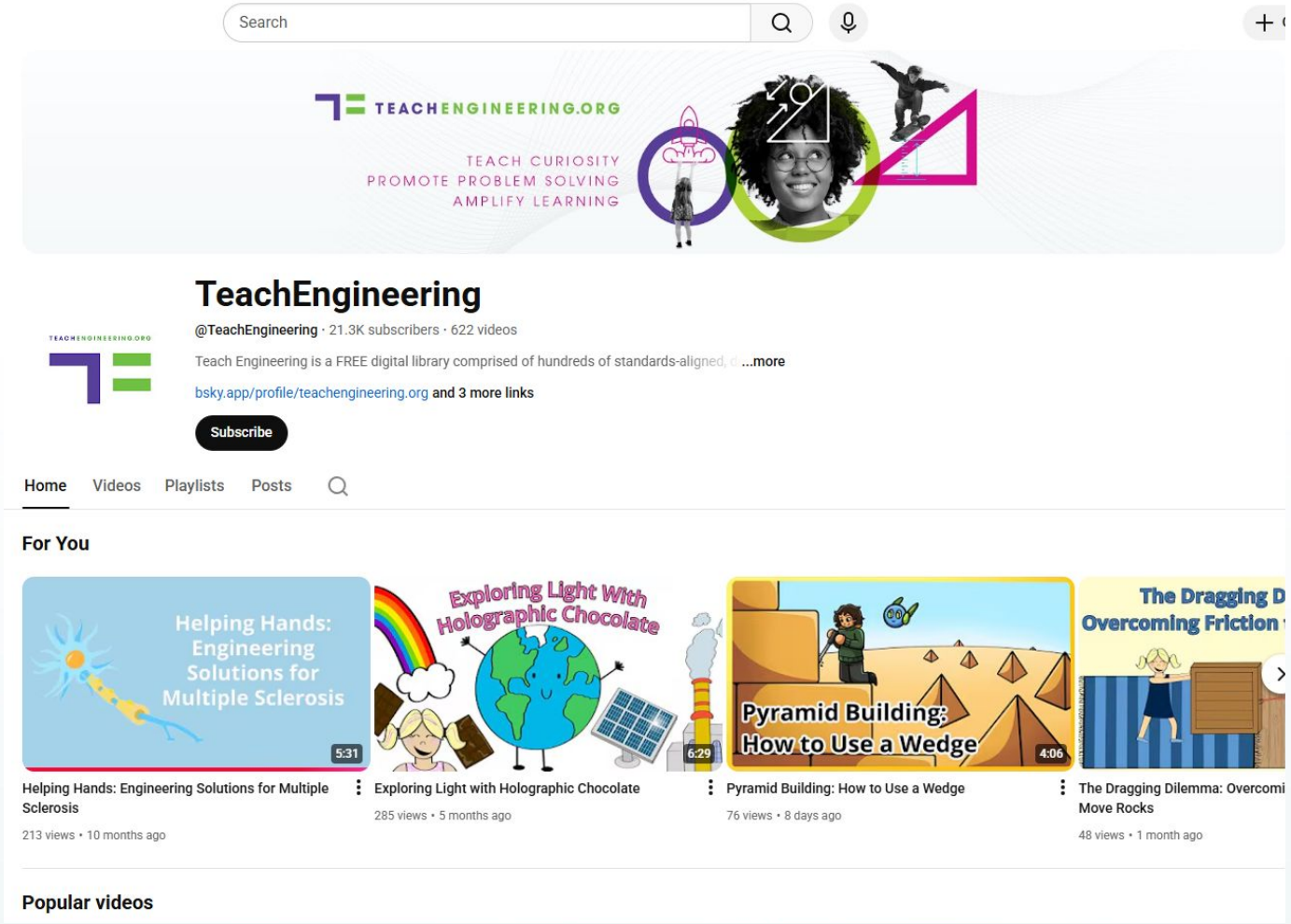
Teach Engineering YouTube Channel



- 622 Videos
- 8.8M Views
- 21.3K subscribers

https://www.youtube.com/c/teachengineering

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Classroom Impact

A middle school science teacher in TX said:

Teach Engineering's greatest strength lies in its ability to support teachers at all levels, from novice to expert. This program has been there to support my growth as an educator and my students' learning. Thanks to Teach Engineering, many of my STEM students have gone on to work as engineers in various fields, and I am confident that this program will continue to inspire and support future generations of engineers.

An elementary science teacher from FL said:

I created eight activities for TE that I have also implemented in my own classroom. Using TE for my students had multiple benefits: active engagement through authentic and meaningful problem solving, exposure to STEM pathways and careers, engaging in cross-curricular opportunities, and increasing their confidence to solve problems. As a teacher, TE provided me with: ready-to-go, curated lessons that do not require many resources, training and professional development leadership opportunities, cross-curricular and grade-level planning, connections, and a sense of confidence in teaching elementary science.

How can you use the Teach Engineering Digital Library:

CURRICULUM

Download and use thousands of free engineering lessons, activities, and how to videos.

PUBLISH

Work with the editorial team to submit and publish original hands-on engineering activities.

REVIEW

Use your teaching and classroom experience to review incoming materials.

PROFESSIONAL DEVELOPMENT

Learn more about engineering design, broadening participation in engineering, and how to use the digital library.

"Teach Engineering's greatest strength lies in its ability to support teachers at all levels, from novice to expert. This program has been there to support my growth as an educator and my students' learning."

- K12 STEM Educator

TRANSLATE THE RESEARCH

Participate in webinars specifically designed for the National Science Foundation's Research Experiences for Teachers (RET) sites and Engineering Research Centers (ERCs) to learn how to translate educators' research experiences into a K-12 engineering curriculum suitable for the collection. Email info@teachengineering.org for more info.

NSF | Engineering UNIVERSITY OF COLORADO BOULDER | ncwit.org

For more info visit TEACHENGINEERING.ORG

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Engineer a brighter future

THANK YOU