Youth Engineering Solutions

Prepare your students for the future with **Youth Engineering Solutions (YES)**! Our free, high-quality, standards-aligned preK–8 engineering and computer science curricula empower educators to inspire the next generation of problem solvers.

By fostering creativity, collaboration, and a passion for STEM, YES helps students build the skills and confidence to shape their world—both in and beyond the classroom.

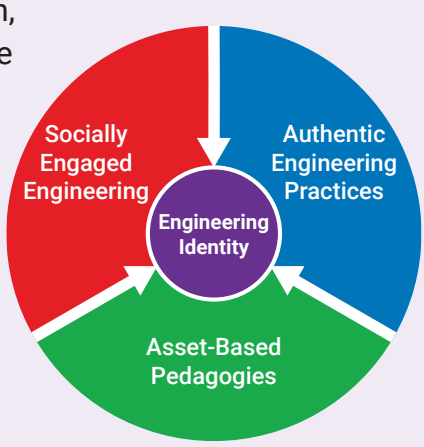
YES Curricula Highlights

- **Standards aligned.**
- **Research based:** classroom tested, educator approved, and proven effective.
- **Hands-on learning:** students use the Engineering Design Process to innovate their design solutions.
- **Designed for all learners:** relatable contexts, multi-modal activities, language development supports, Spanish translations.
- **Fits any budget:** free and low-cost resources.

The YES Approach

Three decades of research and development inform the YES model for engineering learning.

Working in teams, students design, test, and iterate original solutions to real-world challenges. Through collaboration, communication, and persistence through failure, they build engineering identities and learn they can shape their world.



Museum of Science | YES

yes.mos.org

Learn more: yes@mos.org, 617-589-0230

YES Curricula

Wee Engineer

- STEM Education for Preschoolers
- Standards Aligned

Sample Unit
Fans Challenge

Children create a fan that can produce enough wind to move a ball.

YES Elementary

- In School
- Grades K–5
- Standards Aligned

Sample Unit
Engineering Nightlights

Students investigate how materials interact with light.

YES Middle School

- In School
- Grades 6–8
- Standards Aligned

Sample Unit
Engineering Eco-friendly Slippers

Students investigate forces with a focus on friction.

YES Enrichment

- STEM Classes, Clubs, and Camps
- Grades K–5
- Standards Aligned

Sample Unit
Engineering Rescue Shuttles

Youth design shuttles to land a rope near a person who needs to be rescued.

Educator Empowerment

Professional Learning Workshops Available!

"It was valuable to allow students to physically manipulate materials in a structured, yet open-ended way. A lot of our school day is about convergent thinking, coming to one, correct answer, and a lot of it involves staying in your seat and listening, reading, and writing. **I think it was great for students to experience a different way to learn."**

– Elementary STEM educator

STEM is for Everyone!

SCAN ME

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YES Elementary

Grades K–5

Elementary Curriculum

Inspiring Young Minds with Hands-On Engineering

Youth Engineering Solutions (YES) educates the next generation of problem solvers and engineers—because engineers shape the world!

YES Elementary's standards-aligned K–5 units ignite curiosity by engaging students in real-world engineering challenges. Using the Engineering Design Process, they innovate, make connections across STEM fields, and refine solutions through hands-on investigation—building critical thinking and resilience.

Sample Unit:
Engineering Nightlights

Students investigate how materials interact with light as they engineer nightlights that meet user preferences and communicate a message.

Program Highlights

- **Standards-aligned units** for grades K–5.
- **Research based:** backed by three decades of study and development. Classroom tested, educator approved, and proven effective.
- **Hands-on learning:** students use the **Engineering Design Process** to innovate their design solutions.
- **Designed for all learners:** relatable contexts, multimodal activities, language development supports, Spanish translations.
- **Fits any budget:** free and low-cost resources.
- **Cross-curricular connections:** science, math, and ELA.

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YES Elementary Curriculum

Each unit contains nine 45-minute lessons.

Lower Elementary (K–2)

Engineering Sun Hats
Students explore the cooling effects of shade.

Engineering Trash Collectors
Students design scoops to remove trash from a pond.

Engineering Nightlights
Students investigate how materials interact with light.

Engineering Pumpkin Pollinators
Students engineer hand pollinators that move pollen.

Upper Elementary (3–5)

Engineering Magnetic Dog Doors
Students explore magnetic attraction and repulsion.

Engineering Safety Vests
Students use circuits to create a communication system.

Engineering Plastic Filters
Students reduce the impact of plastic on the marine ecosystem.

Teach with Ease

Access Free Downloadable Resources

- Digital Teacher Guide
- Illustrated Story or Comic
- Slides, Vocabulary Cards, Engineering Notebook, Family Resources, Video Playlist, Posters, Spanish Translations, and more!

For Purchase

- Materials Kit for 24 to 30 students
- Full-color Teacher Guide plus printed classroom resources

Educator Empowerment

Professional Learning Workshops Available!

"This program felt so different than the more traditional academic tasks students do in their classrooms. **It allowed students to see themselves as new kinds of learners and feel success in that.** I imagine this confidence will transfer to other learning they do."

– Elementary Educator

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YES Middle School

Grades 6–8

Middle School Curriculum

Equipping Students to Engineer a Brighter Future

Youth Engineering Solutions (YES) educates the next generation of problem solvers and engineers—because engineers shape the world!

YES Middle School engages students in grades 6–8 in hands-on engineering challenges and integrated computer science modules. As they work with peers to generate original solutions, youth see themselves as future STEM professionals. The YES Computer Science Framework invites students to explore computational tools and understand the algorithms that underlie them, equipping them with the skills to succeed in a tech-driven world.

Sample Unit:
Engineering Eco-friendly Slippers

Students investigate forces with a focus on friction as they engineer eco-friendly slippers with a safe amount of traction.

Program Highlights

- **Standards aligned** with science concepts for grades 6–8.
- **Research based:** backed by three decades of study and development. Classroom tested, educator approved, and proven effective.
- **Hands-on learning:** students use the **Engineering Design Process** to innovate their design solutions.
- **Designed for all learners:** relatable contexts, multimodal activities, language development supports, Spanish translations.
- **Fits any budget:** free and low-cost resources.
- **Computer science modules** complement each unit.

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YES Middle School Curriculum

Each unit contains nine 45-minute lessons plus two Computer Science Modules (2 to 3 lessons each)

Grades 6–8

Engineering Unit	+ Computer Science Module
Engineering Medicine Coolers Students explore heat transfer and endothermic mixtures.	• Students modify algorithms to produce different **Heatwave Visualizations**. • Students use temperature sensors to create **Medicine Cooler Alarms**.
Engineering Eco-friendly Slippers Students investigate balanced and unbalanced forces.	• In **User Reviews Analysis**, students use machine learning to analyze qualitative data. • Students use block coding to create and optimize **Step Counters**.

Engineering Landing Pads *Coming Soon*
Student investigate materials that absorb kinetic energy during a collision.

Engineering Vision Extenders *Coming Soon*
Students leverage the reflection of light to increase pedestrian safety.

Engineering Wearable Alert Systems *Coming Soon*
Students combine electrical circuits and mechanical switches to create a "text neck" alert.

Engineering Earthquake-Resistant Buildings *Coming Soon*
Students examine how building height and construction methods impact a building's resilience.

Teach with Ease

Access Free Downloadable Resources

- Digital Teacher Guide
- Context-setting Videos
- Slides, Vocabulary Cards, Engineering Notebook, Family Resources, Video Playlist, Posters, Spanish Translations, and more!

For Purchase

- Materials Kit for 24 students
- Full-color Teacher Guide plus printed classroom resources

Educator Empowerment

Professional Learning Workshops Available!

"Having students work on hands-on projects was great. Students don't have many opportunities to work on projects like this one during the school day and the youth loved working on all the units."

– Middle School Educator

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YES Enrichment

Grades K–5

Enrichment Curriculum

Bring Engineering to Life Anytime, Anywhere

Youth Engineering Solutions (YES) educates the next generation of problem solvers and engineers—because engineers shape the world!

YES Enrichment challenges youth in grades K–5 to tackle real-world problems using the Engineering Design Process. These units are specifically designed to support STEM specials, electives, makerspaces, clubs, camps, spring break, and summer programs. Through hands-on investigation and testing, students learn to embrace challenges, persist through failure, iterate on their designs, and unleash their creativity!

Sample Unit:

Engineering Rescue Shuttles

Youth design shuttles to land a rope near a person who needs to be rescued.

Program Highlights

- **Fits any budget:** free and low-cost resources for grades K–5.
- **Research based:** backed by three decades of study and development. Classroom tested, educator approved, and proven effective.
- **Hands-on learning:** students use the **Engineering Design Process** to innovate their design solutions.
- **Designed for all learners:** relatable contexts, multimodal activities, language development supports, Spanish translations.
- **Career explorations:** embedded career activities relate to the design challenge.
- **Versatile implementation:** designed for use in any educational setting before, during, or afterschool.

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YES Enrichment Curriculum

Each unit contains five core 45-minute activities plus four optional activities to extend learning.

Lower Elementary (K–2)

Engineering Bandages
Youth design a bandage that covers and protects a cut.

Engineering Sails
Youth design a sail that uses wind energy.

Engineering Bubble Wands *Coming Soon*
Youth engineer wands to make a variety of bubbles.

Upper Elementary (3–5)

Engineering Rescue Shuttles
Youth design a shuttle that lands a rope near a person for a water rescue.

Engineering Sock Assistive Devices
Youth design an aid that helps people with limited mobility put on their socks.

Engineering Upcycled Toy Vehicles *Coming Soon*
Youth engineer a toy vehicle using upcycled materials.

Teach with Ease

Access Free Downloadable Resources

- Digital Educator Guide
- Dynamic Poster or Comic
- Slides, Vocabulary Cards, Engineering Notebook, Family Resources, Video Playlist, Posters, Spanish Translations, and more!

For Purchase

- Materials Kit for 24 to 30 youth
- Full-color Educator Guide plus printed classroom resources

Educator Empowerment

Professional Learning Workshops Available!

"The YES program impacted my teaching by giving me the confidence and desire to implement more engineering opportunities both in the afterschool program as well as in my normal classroom. **The collaboration, discussion, and productive struggle opportunities are important for students** to have."

– Elementary Educator

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