Engineering is Elementary.

Open Young Minds to the World of Engineering

Engineering is Elementary is a standards-aligned, teachertested curriculum that forms a foundation for all STEM learning. Twenty hands-on engineering units engage young learners through relevant, real-world challenges that are solved using the engineering design process.

Each unit connects to a life, physical, or earth science topic that is commonly taught at the elementary level and features a field of engineering. The units can be tailored for grades 1-5.

Our dynamic, hands-on engineering activities deepen students' understanding of science and math. Learners also draw upon English language arts and social studies knowledge as they solve the challenges. The open-ended, inquiry-based approach invites students to think creatively, work collaboratively, and develop 21st century problem-solving skills. GRADES 1™5 In School

EiE





Create Access. Ensure Equality.

With Engineering is Elementary, ALL students—including English learners, students who receive special education services, and those who have not flourished in traditional academic settings—can work together to find creative solutions and discover their inner engineer.

An illustrated storybook, featuring diverse young role models from countries around the world, introduces each unit and increases students' cultural awareness.

Spanish-language translations and pictures help make the storybooks accessible to all learners. Each story reinforces literacy principles of character, setting, and plot as it brings complex challenges to life.

Our engineering design challenges only require low-cost, familiar materials that make it possible to implement with ease.

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As a result of the implementation of the EiE curriculum I have seen an increase of student awareness and desire to do science. It has become a favorite part of their day. They enjoy the collaboration and the hands on activities with their peers.

They are becoming problem solvers and do not even realize how much they are learning.

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MEAGAN WILLARD Desert Willow Elementary, Tucson, AZ

Engage and increase interest in science and engineering

Our units tap into children's natural curiosity about how the world around them works, and inspire them to work creatively, innovate, and collaborate to solve engineering design challenges.

Guided by our engineering design process, children learn critical thinking, the value of failure, and the validity of multiple approaches and solutions. Engineering is Elementary increases students' interest in science and engineering careers, as they build 21st century skills.

Instead of egg drops and robot designs, Engineering is Elementary asks students to design solar ovens, knee braces, water filters, and animal shelters, then build, test, and improve their models. Research has shown that girls, boys, and children from different ethnic and socio-economic backgrounds all respond to Engineering is Elementary's simple, creative challenges.



Our Five-Step Engineering Design Process

Engineering is Elementary's age-appropriate engineering design process (EDP) anchors each challenge and introduces students to a flexible, problemsolving approach that they can use in other areas of their lives. It grounds learners in disciplined, inquiry-based thinking that empowers them to see themselves as innovative problem solvers.



A Closer Look at Engineering is Elementary

ARTH SCIENCE

IFE SCIENCE

HYSICAL SCIENC

TEACHER GUIDE

Comprehensive teacher guides make preparation, instruction, activities, and assessment easy. Clear and simple to use, they make lesson planning easiergiving time back to teaching.

CONTEXT-SETTING STORYBOOK

Storybooks integrate literacy and social studies with your engineering and science lessons-and help students understand how STEM subjects are relevant to their lives.

STUDENT ASSESSMENTS

Unit-specific assessments help educators see what students already know about technology and engineering and assess what they learn from Engineering is Elementary lessons.

MATERIALS KIT

Materials kits are packed with enough supplies for 30 students. Refill kits containing only the consumable items are also available, so teachers can reuse units again and again.

DIFFERENTIATION RESOURCES

Spanish translations of storybooks, family letters, and student handouts are available for every unit. Tips for enhancing the experience of English Language Learners are highlighted in the teacher guides.

EDP POSTER

Engineering design process posters keep learners focused on their challenge.

SCIENCE TOPIC	UNIT	ENGINEERING FIELD	SETTING
Astronomy	A Long Way Down: Designing Parachutes	Aerospace	Brazil
Water	Water, Water Everywhere: Designing Water Filters	Environmental	India
Landforms	A Stick in the Mud: Evaluating a Landscape	Geotechnical	Nepal
Earth Materials	A Sticky Situation: Designing Walls	Materials	China
Rocks	Solid as a Rock: Replicating an Artifact	Materials	Russia
Air & Weather	Catching the Wind: Designing Windmills	Mechanical	Denmark
Insects/ Plants	The Best of Bugs: Designing Hand Pollinators	Agricultural	Dominican Republic
Organisms/ Basic Needs	Just Passing Through: Designing Model Membranes	Bioengineering	El Salvador
Human Body	No Bones About It: Designing Knee Braces	Biomedical	Germany
Ecosystems	A Slick Solution: Cleaning an Oil Spill	Environmental	USA
Plants	Thinking Inside the Box: Designing Plant Packages	Package	Jordan
Sound	Sounds Like Fun: Seeing Animal Sounds	Acoustical	Ghana
Solids & Liquids	A Work in Process: Improving a Play Dough Process	Chemical	Canada
Balance & Forces	To Get to the Other Side: Designing Bridges	Civil	USA
Electricity	An Alarming Idea: Designing Alarm Circuits	Electrical	Australia
Energy	Now You're Cooking: Designing Solar Ovens	Green	Botswana
Simple Machines	Marvelous Machines: Making Work Easier	Industrial	USA
Floating & Sinking	Taking the Plunge: Designing Submersibles	Ocean	Greece
Light	Lighten Up: Designing Lighting Systems	Optical	Egypt
Magnetism	The Attraction is Obvious: Designing Maglev Systems	Transportation	Japan



Ensure all learners have what they need to succeed

An extensive digital library shows best teaching practices in action, helps teachers understand the pedagogy, and supports teaching engineering in the elementary classroom.

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STANDARDS ALIGNMENT

Each unit is aligned to state and national science standards to help educators meet their goals for the school year.



ADAPTATION RESOURCES

Advice on adapting units to meet diverse student needs helps teachers reach every learner.



VIDEO LIBRARY

- Videos of each Engineering is Elementary unit show its use in the classroom in two different classrooms.
- 'How To?' video clips demonstrate assembly of prototype models for Engineering is Elementary challenges and take the guesswork out of classroom activities.
- Video vignettes illustrate aspects of elementary engineering teaching to guide instruction.



IMPLEMENTATION RESOURCES

Webinars, blogs, and teacher tips provide guidance to simplify implementation.



DISCUSSION PROMPTS

Teacher discussion prompts include possible questions, student answers, and misconceptions to ease lesson planning.



LESSON EXTENSIONS

Extension lessons, literacy resources, and science resources help teachers make robust connections between engineering and other subject areas.

Bring 15 Years of **Research** and **Innovation** to **Your Classroom**

Proven to boost science and engineering outcomes

To create innovative Engineering is Elementary units, we bring together

- the latest education research
- expert thought leadership
- current science standards
- findings from student focus groups
- practical guidance from elementary teachers around the country on what works best.

We review our products' performance and learner outcomes often, regularly incorporating feedback, and improving the supplementary resources which make the units easily accessible to more and more students and teachers.

We conduct efficacy studies and invite independent evaluators to assess Engineering is Elementary's performance. Our latest research project, Exploring the Efficacy of Engineering is Elementary (E4), was funded by our longest-standing partner, the National Science Foundation. This multi-year study is based on results from 605 classrooms across the country. It not only proves that using Engineering is Elementary significantly improves science and engineering outcomes for ALL students, but it will inform research journal articles, conference presentations, and articles for practitioners, helping shape future engineering education and broader curriculum design.

Support Success in the Classroom

TRAIN-THE-TRAINER

Prepare your teacher educators to confidently run engineering professional development workshops in your school district or state. In our three-day teacher educator workshops, we guide educators through two Engineering is Elementary units and encourage participants to alternate between three roles: student, teacher, and teacher educator. This pedagogical approach prompts educators to think more deeply about effective implementation strategies and helps familiarize educators with how Engineering is Elementary is structured and our recommended teaching approach.

CUSTOMIZED PROFESSIONAL DEVELOPMENT

We come to you. We facilitate workshops tailored to your specific needs.

TEACHER TRAINING WORKSHOPS

During these two-day on-site workshops, we introduce the Engineering is Elementary curriculum, provide sample Engineering is Elementary activities, and discuss implementation strategies. Teachers, especially those who have never taught science or engineering, leave our workshops feeling confident and ready to lead openended engineering design challenges.

ONLINE PROFESSIONAL DEVELOPMENT

Interactive and on-demand, our online PD offers webinars and other learning experiences. Our PD resources include clips of teachers using effective questioning strategies in classrooms, and our integration workshops guide participants in analyzing lesson scenarios incorporating NGSS and Common Core math with engineering.

Developed *with* Teachers *for* Teachers

In the Engineering is Elementary classroom, teachers and students think like engineers. Through practical, hands-on activities that can be completed in a number of ways, teachers and students are challenged to put problem solving at the heart of learning. Students start to see themselves and each other differently, gaining academic and social capital that transcends conventional competitive classroom performance, notions of popularity, and rigid friendship groups. And teachers gain the confidence to apply Engineering is Elementary's principles to their broader work.



A Stick in the Mud: Evaluating a Landscape



↓ 18 ↔ FIELDS OF ENGINEERING REPRESENTED

Engineering is Elementary teaches students the thinking and reasoning skills they need to be successful learners and workers. Because EiE is built around the engineering design process, it teaches students how to solve problems systematically. It also creates the optimism that every problem can be solved, which is relevant to any subject area. These skills and attitudes are important for our kids' future. Life is not multiple choice.

LAURA J. BOTTOMLEY, DIRECTOR, THE ENGINEERING PLACE, NORTH CAROLINA STATE UNIVERSITY



Ready to learn more? Visit **eie.org** or contact **sales@mos.org**

