

Iowa Leadership in Engineering Design (ILED)

<p>GRADE LEVELS: K - 12</p> <p>EDUCATIONAL SETTING: Both in and out of school</p> <p>Award Provides:</p> <ul style="list-style-type: none"> • 3 days of workshop on Engineering Design • Grade-banded kit • Stipend for each day of workshop • Hotel, meals, and travel compensated • Instruction on provided kit and support to create new engineering design activities • On-going support • Continuing education is available! <p>Additional Cost(s) to Awardee in 2023-2024:</p> <ul style="list-style-type: none"> • No additional cost necessary <p>Approximate Sustainability Cost After Award Period:</p> <ul style="list-style-type: none"> • Approximately \$65 	<p>2023-2024 STEM Scale-Up Program Summary:</p> <p>This project embraces the need to empower teachers in the use (kit provided) and creation of engineering design activities. Through a total of three days of workshop, teachers will experience an innovative, grade-level banded kit of engineering design activities as well as create activities that are unique to their classrooms, curriculums, schools, and communities; while emphasizing 3D learning. This project originated in response to a survey of members of the Iowa Science Teaching Section of the Iowa Academy of Science in 2018. A workshop on engineering design is the exact fit for Iowa teachers' unmet needs. Students of teacher-participants will be engaged in engineering design, part of STEM and NGSS. They will use the practices of engineers as they might be analyzing key factors to determine health of soils in agriculture, they might be finding alternative mechanisms in advanced manufacturing and information technologies, or they might be modeling a disease outbreak in medical/health careers. And, in all of these projects and activities, students will be observing, measuring, and recording data, organizing data, analyzing data, drawing conclusions, evaluating results, and presenting their findings – experiences that will prepare students for all STEM careers.</p> <p>Four grade-banded kits (educator chooses one);</p> <p>K - 2: BOATS (Culminates with LEGO boats) 3 - 5: FINDING BALANCE (Culminates with simple levers) 6 - 8: WHAT MAKES IT FLOAT? (Culminates with boat making, in-sink testing) 9 - 12: BIODEGRADABLE POLYMER (Open ended culmination with objects made from biodegradable polymers)</p> <p><i>BUT THE KITS ARE JUST THE BEGINNING!</i> We want to empower you to create your own engineering design-rich activities for your unique needs in whatever setting you find yourself. Your curriculum, your community, your students... and engineering design! Students of teacher-participants will be engaged in engineering design, part of STEM and NGSS. And, in all of these projects and activities, students will be observing, measuring, recording data, organizing data, analyzing data, drawing conclusions, evaluating results, and presenting their findings – experiences that will prepare students for all STEM careers.</p> <p>Engineering design might be the most difficult part of the NGSS. It can also be the pathway to engage your underrepresented groups and disinterested students. Engineering design allows you to present authentic problems that resonate with your students - and that is great teaching at any level!</p> <p>Requirements to Implement the Program:</p> <ol style="list-style-type: none"> 1) Desire to engage learners of all backgrounds with authentic problems. 2) Motivation to modify and enhance existing curriculum to embrace problem-solving lenses of scientists and engineers. 3) Motivation to modify and enhance provided materials to better serve your students, your school, and your community. 4) Creativity and time to design new materials for best fit for your curriculum and the needs of your students. 5) Educator(s) must choose one grade-banded kit. (<u>Indicate the desired kit in the additional comments section of the application</u>). 6) Time for 2 days of workshop in July or August 2023, and 1 day of workshop in Fall 2023. 7) May require access to sink and electricity. 8) Educator(s) must participate in the STEM Council Scale-Up Educator Survey.
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Website:

www.IowaLeadershipinEngineeringDesign.com

Intro to ILED:

<https://youtu.be/PitQyT2zRu8>

**Information Webinars
(must pre-register)**

- Jan. 19, 6:00 pm
- Jan. 24, 7:30 pm

Register for the webinars at:

<https://forms.gle/TAiemQaMbUcZCcHs7>

Iowa Standards Alignment:

K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Professional Development:**Initial Workshop**

Duration: Two days in July or August 2023

Date(s): July 12 and 13, 2023 with additional options that follow.

Location: July 12 and 13 will be at the **University of Northern Iowa campus**. Depending on the number of awardees in an area, up to 6 workshop locations may be offered in July and August (Northeast, North Central, Northwest, Southeast, South Central and Southwest).

Follow-up Workshop

Duration: One day in Fall of 2023

Date(s): TBD (Saturdays in October/November)

Location: Virtual

Photos:

STEM Scale-Up Program Application Link: www.IowaSTEM.org/Scale-Up-Application