the Works® museum

Engineering Fun

2018-2019
EDUCATOR PROGRAM GUIDE

**FIELD TRIPS • FAMILY ENGINEERING NIGHTS •
NIGHT AT THE WORKS • WORKSHOPS AT YOUR LOCATION**

theworks.org

Elementary engineering with The Works Museum: easy for you and fun for your students!

Follow these simple steps:

1 SELECT YOUR OPTION

- Schedule a **FIELD TRIP** to The Works Museum *(page 3).*
- Add a **WORKSHOP** to your field trip *(pages 3, 6-9).*
- Bring **WORKSHOPS** to your location *(pages 4, 6-9).*
- Host a **FAMILY ENGINEERING NIGHT** or **NIGHT AT THE WORKS** *(page 5).*

2 MAKE YOUR RESERVATION

- Reservations are required. Reserve early to ensure your first choice of dates.
- Call **952.888.4262, ext. 215**, email **groups@theworks.org**, or visit our website, **theworks.org**.
- Subsidies are available on a first-come, first-served basis for groups demonstrating financial need.

FIELD TRIPS AT THE WORKS

Plan a visit to The Works Museum, where kids are the Engineers.

MUSEUM VISIT

Explore interactive experiences featuring building, simple machines, optics, sensors, and more! **Exhibits are located on one easy-to-supervise level.** Appropriate for Pre K through grade 6.

Length: One hour. **Museum only.**
Cost: $4.50/student **(price does not include a workshop).**

ADD A WORKSHOP TO YOUR VISIT

Engage your students with a workshop featuring hands-on engineering activities. Most include a take-home project. View workshop options by grade level on pages 6-9.

Workshops support the Minnesota K-12 Academic Standards in Science; see details at theworks.org.

Length: 30 minutes, 60 minutes, 90 minutes, or 2 hours. **Workshop only.**
Cost: $7-12/student **(price does not include Museum visit).**

"I can't express how much I love this field trip. Your museum is so engaging and exciting for our kids. My students love exploring and asking questions and your staff is always so helpful and welcoming."

- 3rd Grade Teacher

To schedule, call 952.888.4262, ext. 215 or email groups@theworks.org

WORKSHOPS AT YOUR LOCATION

Skip the bus and bring our expert educators to you.

Many workshops can be brought to you. See workshop listings on pages 6-9 for options by topic and grade level. Workshops marked with this gear can be brought to you.

Workshops include an introduction to the Engineering Design Process and hands-on activities. Most also include a take-home project.

Workshops support the Minnesota K-12 Academic Standards in Science; see details at theworks.org.

Length: 60 minutes or 90 minutes.
Cost: $10 per student + travel fee for 60-minute workshops.
$12 per student + travel fee for 90-minute workshops.

"Our students enjoyed each session so very much! Your instructors are just simply the best. They knew science AND kids!"

- Gifted and Talented Resource Assistant

To schedule, call 952.888.4262, ext. 215 or email groups@theworks.org

FAMILY ENGINEERING NIGHTS

Bring The Works Museum experience to you

Family Engineering Nights are ideal as stand-alone events or in addition to a family event, open house, or science fair. We provide engineering activities for parents and kids to do together, all supplies needed, and expert trainers. You provide space and volunteers to help facilitate activities.

Each package includes:

- A team engineering challenge that gets families engaged together in a creative way
- Intriguing and fun individual engineering challenges
- At least one take-home project

Length: 2 hours, plus set-up, clean-up, and volunteer orientation.
Cost: $300-$2100, based on number of attendees.
Size: Minimum of 75 and maximum of 600 attendees (adults and children).

NIGHT AT THE WORKS

Exclusive access to The Works Museum

Plan a private evening for families from your school or organization at The Works Museum. Your guests will explore hands-on experiences on our museum floor. Lunchroom available if you wish to serve a meal to your group; food service onsite is not available.

Length: 2 hours.
Cost: $500-$700 based on number of attendees.
Size: Minimum of 100 and maximum of 300 attendees (adults and children).

WORKSHOP TOPICS BY GRADE

Workshops can be added to a field trip or brought to your location *(see pages 3-4).*

All feature hands-on engineering activities and most include a take-home project.

Workshops support the Minnesota K-12 Academic Standards in Science; see details at theworks.org.

Workshops marked with this gear can be brought to your site.

Pre K

START YOUR ENGINEERS
60 minutes/$8 per student

Preschoolers will read a story, explore with materials and tools, and create a project.

Select your topic:

WIND Float objects in wind tubes and construct a sail car.

BRIDGES Engineer a bridge and create a bridge-building kit to take home.

GRADES K-2

30 minutes/$7 per student

KALEIDOSCOPES Investigate light reflection with mirrors. Build a unique and colorful kaleidoscope to take home.

GLOW-IN-THE-DARK SLIME Explore chemical reactions while mixing a batch of gooey polymer slime to bring home!

60 minutes/$8 per student

CIRCUIT EXPLORE Learn about the flow of electricity and hook up circuits to create a light to take home. *Great fit with first grade standards.*

CHEMICAL CHANGES Experiment with chemical changes. Make a tub of slimy glow-in-the-dark polymer to take home. *Great fit with first grade standards.*

ENGINEER WITH K'NEX Explore with our K'Nex building toys. Practice sorting and putting them together, then complete a building challenge. *Great fit with second grade standards.*

LIGHT AND KALEIDOSCOPES Experiment with ways to reflect and absorb light. Build and engineer a colorful kaleidoscope to take home.

MINI-CATAPULTS Practice the Engineering Design Process and use a glue gun to construct a small catapult. Find out how far you can fling an object. *Great fit with second grade standards.*

TEST ENGINEERS Test connecting and cutting tools, familiar and unfamiliar, with a variety of materials. Find out why engineers design tools for different purposes. *Great fit with first and second grade standards.*

WHAT FLOATS YOUR BOAT?
Explore buoyancy with different materials, then build your own boat. Evaluate and improve your design, just like a real engineer! *Great fit with second grade standards.*

To schedule, call 952.888.4262, ext. 215 or email groups@theworks.org

GRADES 3-6

30 minutes/$7 per student

KALEIDOSCOPES Investigate light reflection with mirrors. Build a unique and colorful kaleidoscope to take home.

GLOW-IN-THE-DARK SLIME Explore chemical reactions while mixing a batch of gooey polymer slime to bring home!

60 minutes/$8 per student

FEEL THE NOISE Start with vibrations and the science of sound. Explore how instruments change pitch. With a hammer and nails, construct an ear harp to take home. *Great fit with third grade standards.*

LIGHT AND KALEIDOSCOPES Examine how light travels, changes direction, and is refracted. Build and engineer a colorful kaleidoscope to take home. *Great fit with third and sixth grade standards.*

MINI-CATAPULTS Practice the Engineering Design Process and use a glue gun to construct a small catapult. Find out how far you can fling an object. *Great fit with fourth grade standards.*

MOTOR POWER What's inside a motor, and how does it work? Use magnets and electricity as you build and experiment with "The World's Simplest Motor." Make a crazy wigglebot to take home. *Great fit with fourth grade standards.*

SUPER CIRCUITS Experiment with the components of simple circuits: power, loads, and switches. Construct and wire a motor-powered fan to take home. *Great fit with fourth grade standards.*

GRADES 3-6

"Kids were highly engaged in both the Engineering Design Process and exhibits on the museum floor. We felt well taken care of and the facilitators were energetic, very helpful, and kept me/us in the loop about all the logistics."

- 4th Grade Teacher

90 minutes/$10 per student

PASTA BRIDGES Work in teams using pasta, hot glue, and the Engineering Design Process to build the strongest bridge you can. Test how much weight it can hold before it breaks. *Great fit with fourth and sixth grade standards.*

MAZE ENGINEERING Use the Engineering Design Process to design and construct your own maze, pinball, or pachinko game. Experiment with changes in speed and direction and the effects of gravity and friction. *Great fit with fifth and sixth grade standards.*

2 hours/$12 per student

CATAPULTS Learn about levers and fulcrums. Use hammers, drills, and saws to build your own catapult. Find out how far you can fling an object. *Great fit with fifth grade standards.*

TEACHER WORKSHOPS

Professional development programs for elementary teachers in engineering education.

WHY PROFESSIONAL DEVELOPMENT WITH THE WORKS?

- Introduce teachers to the engineering requirements in Minnesota's STEM standards.
- Give teachers experience with hands-on engineering design challenges to use in their classrooms.
- Provide engaging ways to facilitate collaboration, creative problem solving, spatial thinking, and other engineering habits of mind with students.

WORKSHOP PRICING:

90 minutes: $485; 2 hours: $535; 3 hours: $635
For up to 20 teachers; $2 each additional person, maximum 30 participants. Additional travel fee for sites located more than 30 minutes from The Works Museum.
Workshops can take place: at The Works Museum or your location.

For more information, call Director of Learning Experiences, Kit Wilhite at 952.888.4262 ext. 211, or email kit@theworks.org.

Professional development topics:

SCAFFOLDING ENGINEERING ACTIVITIES WITH LITERATURE

Read popular children's books, then scaffold from reading to engineering activities focused on building and structures.

For teachers of: Pre K to grade 2. Workshop Length: 90 min. - 2 hours

WHEELS AND AXLES

Give students a deeper understanding of what wheels and axles do through free exploration with a variety of tools and materials and the opportunity to test and improve their designs. Great way to start any car-making project.

For teachers of: Grades K-6. Workshop Length: 90 min. - 3 hours

BALL RUNS

Use easy-to-find materials to take students through the engineering design process in simple and engaging ways; great fit with lessons on gravity, inertia, and motion.

For teachers of: Grades K-6. Workshop Length: 90 min. - 3 hours

POP FLY CHALLENGE

Use easy-to-find materials to take students through the engineering design process in simple and engaging ways; great fit with lessons on gravity, inertia, and motion.

For teachers of: Grades K-6. Workshop Length: 90 min.

K'NEX ORIENTATION

If your school owns K'Nex building toys, this orientation enables your students to dig in and explore, incorporating concepts in math, structures, and mechanics.

For teachers of: Grades K-5. Workshop Length: 90 min. - 2 hours

DESIGN AND BUILD AUTOMATA

Give students the opportunity to use materials and tools as they construct a small toy machine.

For teachers of: Grades 3-6. Workshop Length: 2 - 3 hours