the Works® museum

Engineering Fun

2017-2018

EDUCATOR PROGRAM GUIDE

FIELD TRIPS · NIGHT AT THE WORKS
FAMILY ENGINEERING NIGHTS · WORKSHOPS

theworks.org

Experience ENGINEERING at The Works Museum. It's 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

Introduce your students to Engineering at The Works Museum!

MUSEUM VISIT

Our exhibit floor gives students experience with building, simple machines, optics, sensors, and more! **Our Museum experiences are located on one easy-to-supervise level.** Appropriate for Pre K through grade 6.

Length: One hour. **Museum only.**
Cost: $4.25/student **(price does not include a workshop).**

ADD A WORKSHOP TO YOUR VISIT

Engage students with hands-on engineering activities. Most workshops 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: $6-12/student **(price does not include a Museum Visit).**

"Our students had a fantastic time. The workshop was very engaging with just the right amount of 'teaching' and 'exploring'. The kids would've definitely stayed longer in the museum – such fun activities!"

- 3rd grade teacher

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 your location.

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: $210-$400, based on number of students and workshop length, plus travel fees.

Book 2-4 workshops of the same title on the same date, and receive 10% off.

"I have heard nothing but great reviews from our 2nd grade teachers! It was the perfect lesson for our current unit of study and your presenters were fantastic! Kudos to you guys on an awesome program opportunity. Thank you for traveling to our school today, we loved the activity!"

- 2nd grade teacher

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 as an addition to your family night, open house, or science fair. The Works Museum provides engineering activities for parents and kids to do together, and all supplies needed for the activities. You provide space and volunteers to help facilitate activities.

Length: 2 hours, plus set-up, clean-up, and volunteer orientation.
Cost: $300-$2100, based on number of attendees.
Size: Minimum 75 - maximum 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 activities and open-ended engineering challenges on our experience floor.

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

Add a Papa John's Pizza order to your event, save 20% on the pizza order.

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.

> ***"It was so wonderful! The best field trip I have taken students on...by far! We look forward to working with you again!"***
>
> *- 1st Grade Teacher*

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.

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

GRADES K-2

30 minutes/$6 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 different 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 polymer that glows in the dark. Great fit with first grade standards.

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

LIGHT AND KALEIDOSCOPES Experiment with reflecting and absorbing light. Build and engineer a colorful kaleidoscope to take home. Great fit with second 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 second grade standards.

NEW! TEST ENGINEERS Test different tools and materials, and use what you learn to figure out what tool works best with what material. Solve the mystery tool challenge. 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.

GRADES 3-6



30 minutes/$6 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.

MIXING MOLECULES Determine which combination of chemicals will make the best slimy polymer through experimentation and observation. Use this experience to formulate a batch of glow-in-the-dark slime to take home. Great fit with fourth and sixth grade standards.

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GRADES 3-6



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.

90 minutes/$10 per student

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. Uses hot glue guns. Great fit with fifth and sixth grade standards.

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.

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 for elementary educators. We make engineering educaton easy!

Why professional development with The Works Museum?

- 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 fee for time and mileage for sites located more than 30 minutes' drive time from The Works Museum.

Workshops take place at The Works Museum or at a location of your choice.

Workshop 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 **Length:** 90 minutes-3 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 **Length**: 90 minutes-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 **Length:** 90 minutes-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 motion.
For teachers of: Grades K-6 **Length:** 90 minutes

K'NEX ORIENTATION If your school owns K'Nex building kits, engage your students to dig in and explore, incorporating concepts in math, structures, and mechanics.
For teachers of: Grades K-5 **Length:** 90 minutes-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 **Length:** 2-3 hours

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

the Works® museum
Engineering Fun

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