

THE FORGE

WORKSHOPS

Below are brief descriptions of the workshops designed for The Forge. Check the website or the digital screens inside the Museum for the workshop scheduled during your visit. A limited number of guests can participate in each workshop. Sign up for workshops in person at the Guest Services desk.

WIRE IT

Learn the basics of wiring a circuit(s) with copper tape, LEDs, batteries, stainless steel thread, breadboards or soldering irons. Electrify a notebook, jewelry and more.

Learn Basic Soldering: Circuitry Level I

Explore and enhance your basic soldering skills in this kit-based, introductory soldering workshop.

- Skills used: Soldering, basic circuitry
- Tools used: Soldering iron/solder, wires/batteries, third hand tools, magnifying glasses, needle nose pliers, flush diagonal cutters

Build a Solar Powered Phone Charger: Circuitry Level II

Take your newfound soldering skills to the next level by designing and building your own solar powered phone charger.

- Skills used: Soldering, intermediate circuitry, CAD/physical design
- Tools used: Soldering iron/solder, wires/batteries, solar panels, third hand tools, magnifying glasses, needle nose pliers, flush diagonal cutters, Auto CAD software

Paper Speaker

Create and wire up a working speaker made of paper, cardboard, and a few other supplies.

- Skills used: Electronics, design, measuring, cutting
- Tools used: Wire cutters, Utility knives, scissors, copper wire, various materials

STITCH IT

Explore the textile arts and sciences by using a sewing machine and learning to hand stitch. Use your design skills to create a sew-able masterpiece.

Create a Journal: Bookbinding Level I

Learn the basic operation of a sewing machine by binding a "maker" journal, perfect for recording your next great idea.

- Skills used: Design, measuring, cutting, sewing
- Tools used: Utility knives, scissors, sewing machines, hand sewing needles, various materials

Light Up Your Journal: Bookbinding Level II

Give your notebook some light-up bling by incorporating an embedded circuit.

- Skills used: Design, measuring, circuitry, sewing
- Tools used: Cooper tape, stainless steel thread, hand-sewing needles, scissors, LEDs, batteries

Monkey's Fist Keychain: Knotwork Level 1

Create a sweet keychain and learn to weave rope to create a classical, nautical stopper knot.

- Skills used: Measuring, weaving
- Skills used: Ruler, scissors, needle nose pliers, lighter

HAT MAKING

Use a sewing machine and basic hand stitching to craft your own, unique hat!

- Skills used: Measuring, cutting, design, sewing
- Skills used: Sewing machine, scissors, measuring tape, patterns

WIRE IT AND STITCH IT

Create Glowing Jewelry: Embeddable Electronics Level I

Combine sewing and stainless steel thread to create glowing jewelry masterpieces.

- Skills used: Design, sewing, circuitry
- Tools used: Needles, stainless steel thread, LEDs, batteries, various textiles/materials

Embedded Microcontrollers: Embeddable Electronics Level II

Level-up your circuitry and sewing skills by incorporating a microcontroller in your textile project.

- Skills used: Design, sewing, intermediate circuitry, basic to intermediate coding
- Tools used: Needles, stainless steel thread/fiber, microcontroller, LEDs, batteries, various textiles/materials





WORKSHOPS

BUILD IT

Use a variety of tools, processes and your creativity to design a functional object. Explore scaling with a pantograph, modern agriculture techniques, 2D/3D CAD software and other projects.

Build a One-Plant Hydroponic System: Sustainable Design Level

Design a one-plant hydroponic system and gain the ability to grow your greens, tomatoes or other veggies year round.

- Skills used: Design, cutting, drilling, basic biology
- Tools used: Utility knives, drills, polyvinyl tubing, small air pump, net pot

Build an Ebb and Flow Hydroponic System: Sustainable Design Level II:

Step your design and hydroponics knowledge up to the next level with an ebb and flow system. With this relatively simple design you can grow veggies in your house year-round!

- Skills used: Design, mathematics, cutting, drilling, basic biology, intermediate hydroponics
- Tools used: Utility knives, drills, polyvinyl tubing, small air pump, small water pump, automatic timer device, net pots

Create Hand Routed Nametags: Nametag Level I

Create your own wood or acrylic nametag using hand-routing techniques with a Dremel rotary tool. If time allows, add a little electronic flare to light up your name.

- Skills used: Design, measuring, hand routing/grinding, potentially electronics
- Tools used: Dremel tools, clamps, LEDs/batteries, hot glue, magnets

Create Machine Routed Nametag: Nametag Level II

Explore CAD software and CNC machining by creating your own file for routing or laser cutting.

- Skills used: CAD design, machine setup, electronics
- Tools used: Computers, CNC/laser, batteries/LEDs

Build a Cardboard Pantograph: Pantograph Level I

Build this fun drafting/scaling tool out of cardboard. After experimenting with your cardboard prototype, explore creating another pantographs out of different materials.

- Skills used: Rapid prototyping, measuring, cutting, assembly, drafting/drawing
- Tools used: Utility knives, scissors, fastening hardware

Build a Wooden Pantograph: Pantograph Level II

Enhance the sturdiness of your pantograph by making a more rigid, wooden version. Explore adding more fulcrum points and markers to your pantograph to draw multiple copies simultaneously.

- Skills used: Design, measuring/mathematics, cutting, assembly, drafting/drawing
- Tools used: Handsaws, clamps, drills, fastening hardware

Architectural Model Making

Learn the basics of building architectural models with armature wire and paper mache techniques.

- Skills used: Design, measurement, paper manipulation
- Tools used: Needle nose pliers, wire armature, scissors, utility knives (optional)



PLAY IT

Build something you can play! Using design skills, creativity and a little elbow grease to create a playable object like a musical instrument or a video game controller.

Build a Guitar: Diddly Bow Level I

Build a one-string slide guitar that you can jam on!

- Skills used: Design, measuring, sawing, drilling, sanding/filing/rasping
- Tools used: Handsaws, drills, clamps, screwdrivers

Build an Electric Guitar: Diddly Bow Level II

Electrify your one string slide guitar to really turn it up to 11!

- Skills used: Design, measuring, drilling, circuitry wiring, soldering
- Tools used: Drill, clamps, soldering irons, heat guns

Create a Video Game Controller

Create your own video game controller with a twist, using a MakeyMakey and a variety of conductive objects.

- Skills Used: Design, measuring, understanding of conductivity
- Tools Used: Utility knives, scissors