

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

(Age recommendation: 11 to 111)

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

Paper Speaker

(Age recommendation: 8 to 88)

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

Robot Petting Zoo

(Age recommendation: 8 to 88)

Use your creativity to create a moving, sensor-responding, robotic animal using Hummingbird Robotics kits and SNAP.

- Skills used: Measuring, cutting, coding, electronics, design
- Tools used: Hummingbird robotics kits, sensors, utility knives, scissors, hot glue guns

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

(Age recommendation: 8 to 88)

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

(Age recommendation: 8 to 88)

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

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

Monkey's Fist Keychain: Knotwork Level 1

(Age recommendation: 11 to 111)

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

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

Hat Making

(Age recommendation: 8 to 88)

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

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

Weave a Potholder

(Age recommendation: 8 to 88)

Learn to weave by creating your own loom and potholder!

- Skills used: weaving, pattern making, patience, design
- Tools used: Handmade loom, thread/yarn, cardboard





WORKSHOPS

WIRE IT AND STITCH IT

Create Glowing Jewelry: Embeddable Electronics Level I

(Age recommendation: 8 to 88)

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

(Age recommendation: 11 to 111)

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

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: Diddley Bow Level I

(Age recommendation: 11 to 111)

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: Diddley Bow Level II

(Age recommendation: 11 to 111)

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

(Age recommendation: 8 to 88)

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

DESIGN IT

Architectural Model Making

(Age recommendation: 8 to 88)

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)

Intro to 3D Design

(Age recommendation: 8 to 88)

Learn the basics of 3D design and CAD software with TinkerCaD.

- Skills used: Computer assisted design, geometry, mathematics, measuring, spatial reasoning
- Tools used: Computers, CAD software, your brain

Vector Design and Cutting

(Age recommendation: 11 to 111)

Learn how to design an SVG file and cut it using CNC processes.

- Skills used: Design, geometry, measuring, machine processes
- Tools used: Adobe Illustrator and other SVG software, laser cutter or CNC router, your creative brain

Design a Sistrum

(Age recommendation: 8 to 88)

Learn how to make an ancient Roman shaker instrument.

- **Skills Used:** Design, geometry, measuring, music
- **Tools Used:** Saws, drills, wire, pliers, twine





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

(Age recommendation: 11 to 111)

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

(Age recommendation: 11 to 111)

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

(Age recommendation: 11 to 111)

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

(Age recommendation: 11 to 111)

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

(Age recommendation: 8 to 88)

Build this fun drafting/scaling tool out of cardboard. After experimenting with your cardboard prototype, explore creating other 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

(Age recommendation: 11 to 111)

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

Paper Marbling

(Age recommendation: 8 to 88)

Create your own marbled masterpieces and learn about chemical processes and aqueous surface design.

- Skills used: Design, pattern making, paper manipulation
- Tools used: Paper, high flow acrylics, fans, heat guns (optional)

Make a Toolbox

(Age recommendation: 11 to 111)

Learn and use basic woodworking skills to make your own toolbox.

- Skills used: Measuring, cutting, joining, design
- Tools used: Hammer, nails, clamps, saw, sandpaper/files, drill

Etching/Printing

(Age recommendation: 8 to 88)

Create your own drypoint etching in acrylic and explore the printing process.

- Skills used: Measuring, tracing, etching, ink blotting, pressing
- Tools used: Cast acrylic, needle tools or nails, clamps, press

Build a Ceramic Pot

(Age recommendation: 8 to 88)

Design and build your own handmade ceramic vessel.

- **Skills Used:** Observation, ceramic building techniques, ceramic finishing techniques
- **Tools Used:** Clay, ceramic shaping and carving tools

