

### Level 1 Overview

- Basic Hand Tools
- Autodesk Fusion 360 (Intro, Sketching, Sculpting)
- Arduino Basics
- Laser Etcher Overview
- Basic Electronics & Soldering Skills
- Vacuum Forming
- T- Shirt Silk Screening
- Hand Sewing Basics
- Silicone Molding – Open Face Mold
- Woodshop - Skills & Practice
- Woodshop - Tic-Tac-Toe Game Board
- Woodshop - Marshmallow Crossbow

### Basic Hand Tools

**Activity:** Disassemble and reassemble BMX bicycles.

**Tools used:** Assorted hand tools including: box wrenches, allen wrenches, screw drivers, adjustable wrench, various types of pliers.

### Autodesk Fusion 360 Software Introduction

**Activity:** Use Fusion 360 to learn fundamental CAD modeling techniques including sketching, modeling, and sculpting. The students will then be challenged to design their own desk top name badge for 3D printing. 3D printed name badge will be given to students as next class.

**Tools used:** Free software from Autodesk, a laptop, extension cords, power strips, and projector

**Students prep / supplies:** Bring their own PC based laptops. Students / parents to preinstall software.

### Arduino Basics

**Activity:** Use kit provided to learn first-hand about Arduino hardware, bread board, and sensors.

Students will complete activities to assemble breadboard circuits and write code to control LED lights.

**Tools used:** Free downloaded software from Autodesk, a laptop and overhead projector

**Students prep / supplies:** Bring their own PC based laptops. Students / parents to preinstall software.

### Laser Etcher Overview

**Activity:** Laser etch wood components on laser of their own design. Students to create a new design in CorelDraw or download a design from the internet and modify it for etching. Time will be provided to assemble the laser cut wood project and fine tune it to make sure it works as designed.

**Tools used:** laser etcher, PC's with Corel Draw and internet access

### Basic Electronics & Soldering Skills

**Activity:** Class room explanation of circuits, electrical concepts and wiring. Build an "Operation" style buzzer game. Time will be provided to practice wire stripping, terminating and soldering.

**Tools used:** Assorted electronics hand tools including: wire strippers, crimpers, scissors, heat gun, soldering iron, multi-meter.

### Vacuum Forming

**Activity:** Learn to use vacuum former to make super hero masks. Learn about temperature, vacuum pressure, mold draft, draw depths and part lines. Students will de-mold, paint, and decorate the masks for use.

**Tools used:** Vacuum former, Plaster molds of super hero masks

### **T - Shirt Silk Screening**

**Activity:** Learn to setup silk screen press with vinyl cut designs and silk screen shirts using 2 colors. Students will make their own 2- color Urban Workshop t-shirt to take home.

**Tools used:** Silk screen press, screens, squeegees, and clean up materials

**Students prep / supplies:** Kid's shirt sizes ahead of time so we can purchase shirts.

### **Basic Sewing**

**Activity:** Layout and measure fabric, prepare needle and thread, review types of stitches and hems, sew together materials to make a tool belt.

**Tools used:** Needles, thread, scissors, rulers, layout table area

### **Silicone Molding**

**Activity:** Using a master part, make two molds and replicate parts. One mold to be an open face mold and the other a full silicone mold.

**Tools used:** Silicone molding kits, mold release, plastic cups to use as mold containers, scissors, gram scale, mixing cups, stirrers, rags

### **Woodshop - Skills & Practice**

**Activity:** Use basic wood shop hand tools to learn and practice basic skills.

**Tools used:** Handsaw, hand drill, drill bits, files, sand paper, hammer, screw driver

### **Woodshop - Tic-Tac-Toe Game Board**

**Activity:** Use basic wood shop hand tools to make a tic-tac-toe board game with hidden internal game piece holder. Requires layout, pre-marking for drilling, drilling and finish sanding.

**Tools used:** Handsaw, hand drill, drill bits, files, sand paper, hammer, screw driver

### **Woodshop – Marshmallow Crossbow**

**Activity:** Use basic hand tools to finish and fit provided parts and assemble a marshmallow crossbow.

**Tools used:** Scroll saw, hand drill & bits, file, sand paper, scissors, hammer, screw driver