K-12 MAKERLAB
MAKE @ EDGERTON CENTER

K-12 MAKER WORKSHOPS at MIT
Spring & Summer 2020
Makerspace Tools, Skills, & Operations for Educators

One-day workshops for educators

- develop technical skills with Maker tools
- set up school Makerspaces
- design projects and learn effective ways to use Maker tools with students in grades K-12

Beginners are welcome! The workshops are appropriate for teachers with tools and materials ranging from portable carts to full-blown makerspaces. No experience required except for the Maker Project Design workshop, where experience with at least one Maker technology is recommended.

SPRING 2020 workshops

	Mon	Tues	Wed	Thurs	Fri
April	6	7 Physical Computing with Arduino	8 Electronics for Makers	9 Physical Computing: Micro:bit	10
April	13	14	15	16	17
April	20	21	22	23	24
April	27	28 Laser, Vinyl/Craft Cutter, 2D Modeling	29 3D Printing and Modeling	30 Making with Music: Electronic	1
May	4	5 Design & Operate a Makerspace	6 Maker Project Design	7 Making with Music: Acoustic	8

SUMMER 2020 workshops

	Mon	Tues	Wed	Thurs	Fri
June	15	16	17 Physical Computing: Arduino	18 Electronics for Makers	19 Physical Computing: Micro:bit
June	22 Design & Operate a Makerspace	23 3D Printing and Modeling	24 Laser, Vinyl/Craft Cutter, 2D Modeling	25	26
June	29	30	1	2	3
July	6 3D Printing and Modeling	7 Laser, Vinyl/Craft Cutter, 2D Modeling	8 Electronics for Makers	9 Maker Project Design	10 Physical Computing: Micro:bit
July	13 Design & Operate a Makerspace	14 3D Printing and Modeling	15 Laser, Vinyl/Craft Cutter, 2D Modeling	*Master Making in the Classroom* Days 1, 2 Learn more and register at **edgerton.mit.edu/k-12/MasterMaking**	

Course descriptions and registration: **edgerton.mit.edu/k-12/makerspaces**

MIT Massachusetts Institute of Technology

Workshop Descriptions

3-D Modeling and Printing

Learn to create 3D models with Tinkercad, prep (slice) models for print, change filament, and remove parts. Get ready to use a 3-D printer with a classroom of students. Leave with an original print of your own.

"Diane de-mystified 3D printers for me...it was great being able to ask all our uninformed questions, and have them taken seriously."

Electronics for Makers

Learn and practice principles of electricity by building circuits with a variety of switches, LEDs, buzzers, and motors. Use soldering irons and multi-meters correctly. Figure out what electrical components and tools are most appropriate for your students and your budget. Build a take-home project and make a component display board for your classroom.

"...really helped me make connections in my head and fill in the holes that were keeping me from understanding more than the most basic electronics."

Design and Operate a Makerspace, with Shop Tool Training

Explore resources for the design, layout, and safe operation of a Makerspace. Learn and use a variety of hand tools and power tools, materials, and fasteners on your own custom project.

"Learned what entry level tools would be appropriate for a middle school makerspace. On the way home I stopped to look at purchasing some new tools!"

Making with Music 1, 2

Explore music through simple, engaging hands-on project builds. Take both classes or just one:

Class 1 - Intro to electronics in music. Hack toys, make piezo pickups, and expand your definition of music.

Class 2 - intro to acoustics + music theory. Build melodic instruments from wood and explore the physics of music-making.

Laser Cutter, Vinyl Cutter and 2-D Modeling

Learn how laser and vinyl cutters can be useful tools in your Makerspace. Practice laser etching and cutting on several materials. Try out a simpler technology: vinyl/craft cutters. Explore 2-D modeling techniques that allow you to use a variety of image sources. Take home project samples.

"The sample box project using Gravit was great and sparked a few potential ideas for the classroom. We also plan on purchasing at least one vinyl cutter after seeing it in use."

Physical Computing with Micro:bit and Arduino

Coding is meaningful to students when they can read in touches or light levels and control electrical devices like motors, LEDs, and speakers. Micro:bit and Arduino are both free coding environments that are well-supported, easy to source, and have a wide array of devices designed to interface with them.

Follow our tutorial projects to learn and practice coding basics and troubleshooting strategies. Leave with classroom ideas, your own project and an extensive kit of starter materials.

Micro:bit is appropriate for students 4th grade and up. Arduino is best for high school or students that can use breadboards.

Maker Project Design

After you and your students learn how to use the tools and tech, what happens next? This one-day experience gives you the opportunity to Join us and learn how to design custom projects that integrate Maker technologies with your academic curriculum. Learn simple hands-on activities that introduce and build enthusiasm for Making. Explore sample Maker projects and our online IdeaGallery. **We recommend that participants have some prior skills in at least one Maker technology.**