

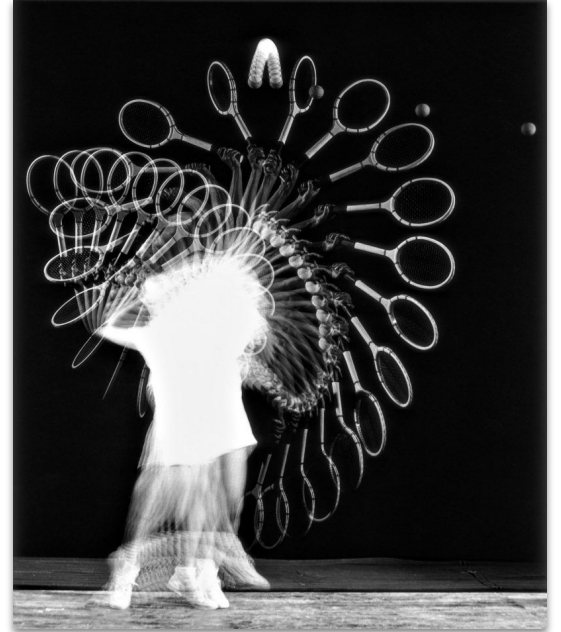
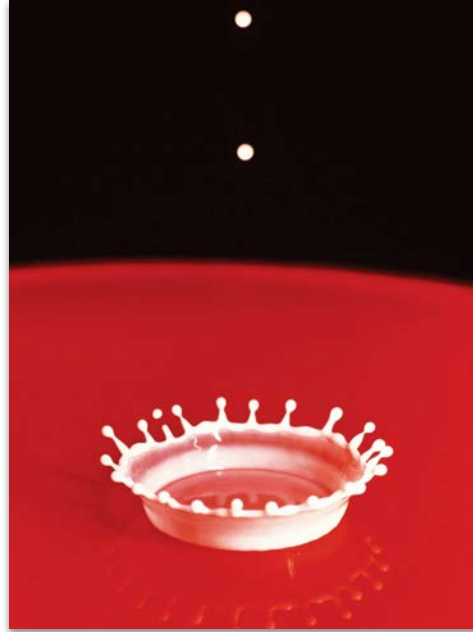
K-12 Maker at the MIT Edgerton Center

Students learning and growing through Making in the classroom



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MIT Edgerton Center



The MIT Edgerton Center was founded in 1992 to honor the legacy of Harold (Doc) Edgerton, an inventor, entrepreneur, explorer and MIT professor of electrical engineering. He pioneered strobe photography and high speed imaging, creating new ways to see things. More than that, he welcomed students into his labs to work on personal projects creating a Makerspace long before that name was coined.

Experiential Learning at the Edgerton Center



MIT Clubs and Teams have a permanent home with shop facilities: MIT Driverless, Solar Electric Vehicle, MIT Robotics, MIT Motorsports, Design for America, and more.



The **Student Project Lab** has been a Makerspace in operation for decades and hosts a variety of MIT courses and programs



We honor Harold “Doc” Edgerton’s legacy of innovation and fun in learning through **K-12 Outreach** by providing school-year field trips and summer camps

Key Needs in K-12 Education



Students:

- Engagement
- Persisting past barriers and failure
- STEM connections and awareness
- 21st century skills

Teachers:

- Create relevant learning experiences
- Use digital resources and technologies
- Facilitate learning instead of instructing

What defines a Maker project?

Using cool tools

to build

something creative of your own

with others

improving as you go

What do kids get from a Maker project?

Using cool tools → **Tech skills**

to build → **Hands-on thinking**

something creative of your own → **Ownership**

with others → **Collaboration**

improving as you go → **Iteration**

Making to learn vs. Making stuff

Using cool tools
to build
something creative of your own
with others
improving as you go

- Appropriate digital fab, electronics, tech tools
- **Show examples, avoid a detailed build guide**
- Different products using the same tools
- **individual or group projects, done in peer groups**
- Without iteration, it's just an activity

Does Maker fit in an academic classroom?

Teachers are responsible for students learning specific content and skills.

AND

The “Big Picture” goal of school is to empower students in their lives.

Often called “21st century skills”, these life skills can be integrated in all subjects:

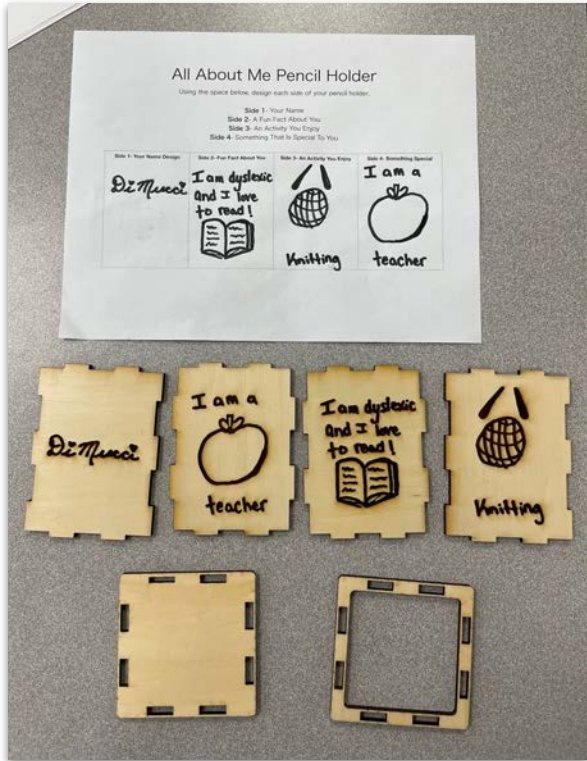
- learning on their own
- working with others
- using technology appropriately
- communicating well
- thinking critically
- persisting through setbacks

Maker projects can be a way to successfully accomplish both of those goals.



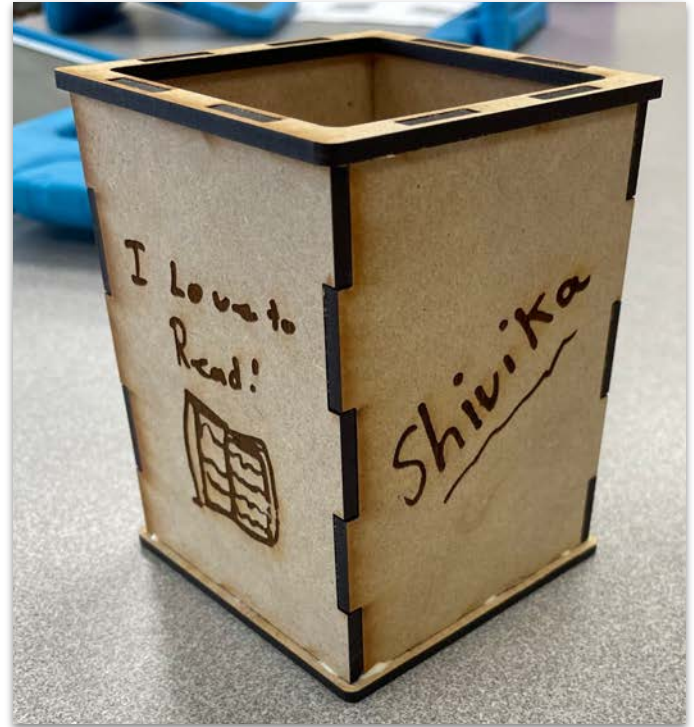
What does a Maker project look like?

Maker projects from teachers



“About Me” pencil holder

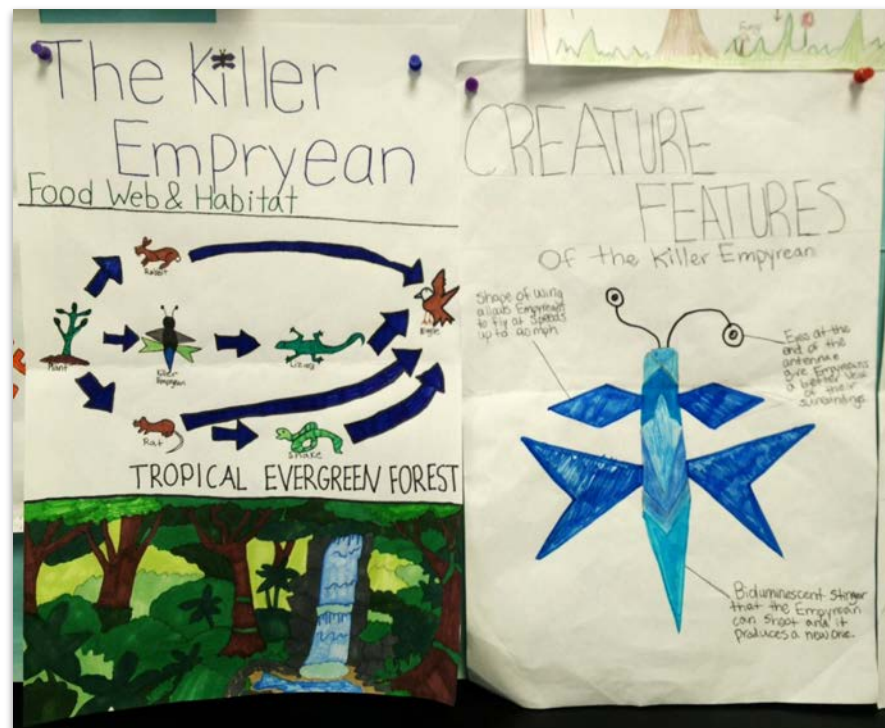
Students learned the Glowforge laser cutter while reflecting on and expressing identity



Maker projects from teachers

Create-a-Creature

Students designed and printed a 3D critter model to reinforce learning about adaptation



Maker projects from teachers

Trojan Horse Legend

ELL students used a vinyl cutter to add new vocabulary words to a model



Maker projects from teachers



Passport Stamps

Students created craft foam stamps with a Cricut that represented a place that they researched



Maker projects from teachers

Monuments



Students used crafts tools or digital fabrication to build model monuments to underrepresented people and events



Maker projects from teachers



Fallas from Valencia

Students created *fallas* of problems they wanted to rid the world of, and created a video of their statues "burning" in a fire



[Video](#) - "burning" of the fallas

Maker projects from teachers



“Layered Identities”

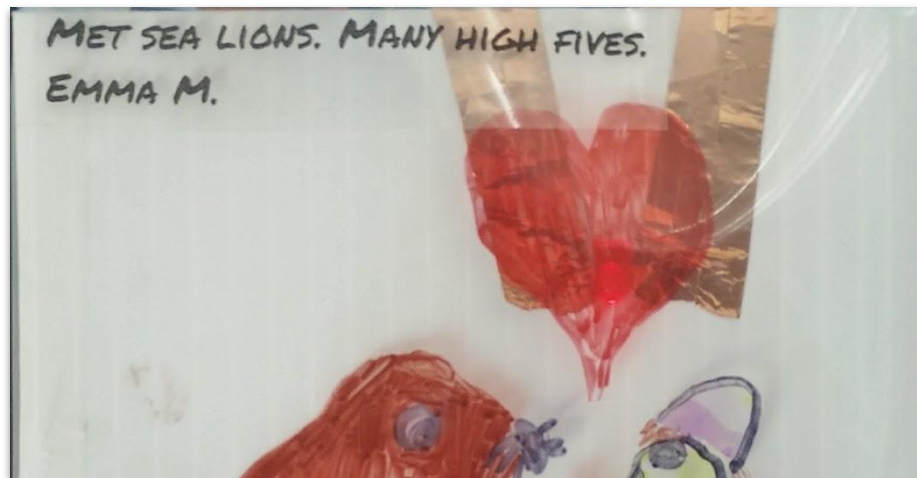
for Hispanic/Latinx Heritage Month + Indigenous People’s Day
High school project involving research, design, art, expression,
collaboration, fabrication technologies

Maker projects from teachers

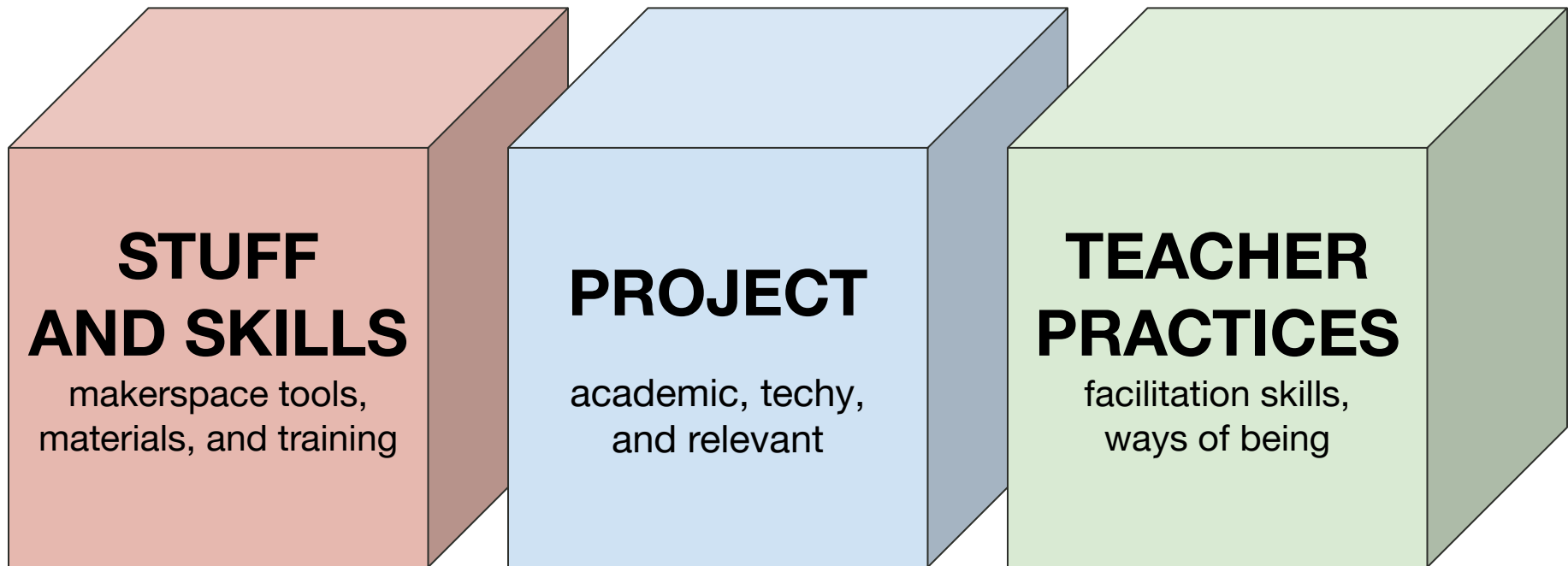


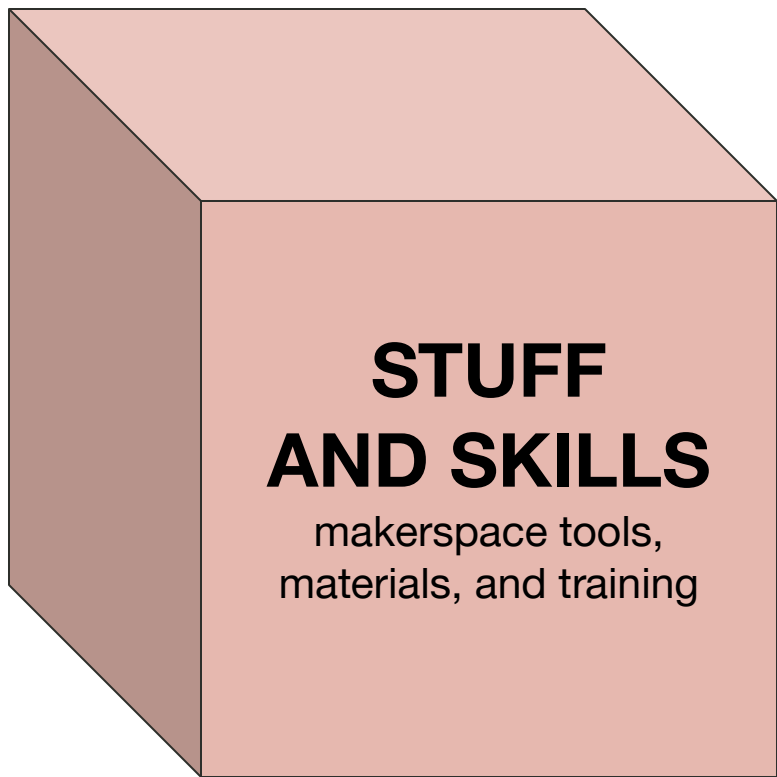
Six Word Stories

Magnetic tiles lit up students' creative writing assignment



Essential parts of a good Maker experience





We address this with:

- [Maker Project Workshops](#)
- Tool and facility resources that we create and publish online

K-12 Maker Project Workshops

Spend a day at MIT with K-12 Maker experts learning digital fabrication (3D printers, laser cutters, Cricut cutters), electronics, physical computing or handcrafting tools and techniques through fun, engaging Maker projects that you can adapt to use in your classes.



Make by Hand

Maker projects with real crafting, textile, and shop tools



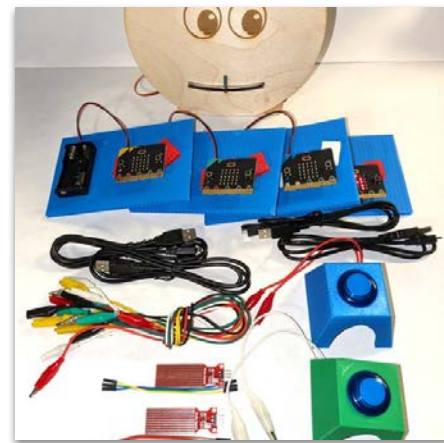
Digital Fabrication

Maker projects with 3D printers, laser cutters & vinyl cutters



Electronics

Light up learning with simple electronics Maker projects



Physical Computing

Maker projects that bring coding to life in the real world

k12maker.mit.edu/maker-project-workshops

k12maker.mit.edu online resources

The screenshot shows the MIT Edgerton Center logo on the left, the 'MAKE' logo in the center, and the MIT logo on the right. Below the logos is the text 'Maker Resources for K-12 Educators'. A navigation bar includes links for 'Home', 'Teacher PD', 'Create Projects', 'Run a Makerspace' (highlighted), 'Maker Tools', and 'Articles and Books'. The main content area is titled 'Run a Makerspace' and includes a sub-header 'Operations, Tool Training, and Makerspace Galleries'. A paragraph of text explains that running a makerspace may seem daunting but that many makers have paved the way. Below this text are three featured articles: 'Makerspace Design Guide' with an image of a makerspace, 'Training and Supervision' with a diagram of a workstation, and 'Staff, Hours, and Scheduling' with an image of a 'mentimeter' sign.

MIT Edgerton Center

MAKE

MIT

Maker Resources for K-12 Educators

Home Teacher PD Create Projects Run a Makerspace Maker Tools Articles and Books

Run a Makerspace

Operations, Tool Training, and Makerspace Galleries

Running a Makerspace may seem daunting at first, but so many Makers before you have paved the way that there's no need to start from absolute scratch! While no two Makerspaces look alike, you'll notice a lot of similarities between spaces. Best practices in organizing and running a Makerspace foster safety, communication, collaboration, student ownership, and play!

Makerspace Design Guide

Guidelines for a shared high school Makerspace, that can accommodate a class of 25 students, and support them in creative, empowering

Training and Supervision

How to Use

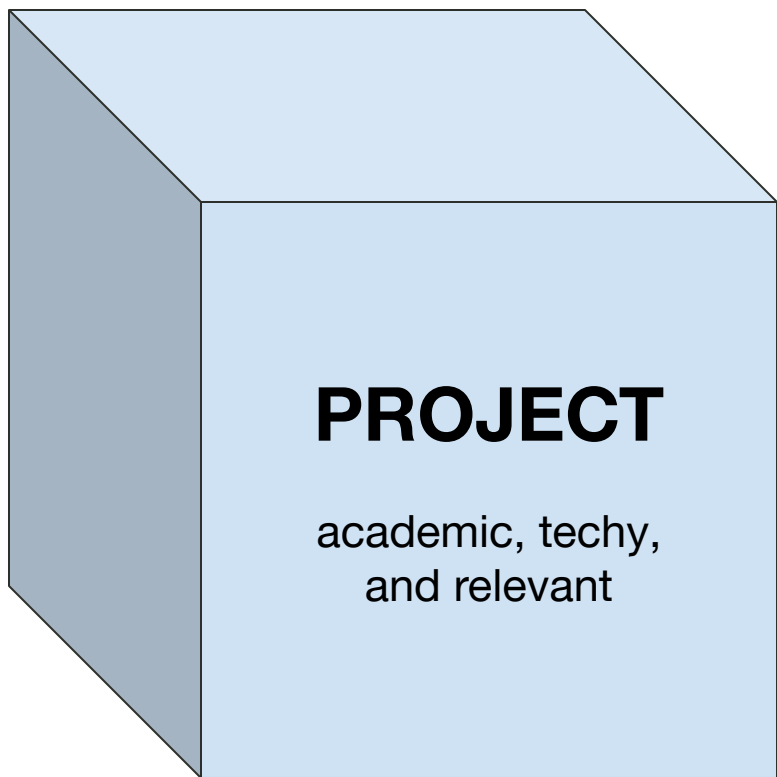
All makers need some type of training to work with specialized tools to keep the space safe for

Staff, Hours, and Scheduling

Your Makerspace's accessibility depends heavily on available staffing. How can you empower volunteers,

Our website is an invaluable **free** resource for all Makers and educators. We cover everything you need to know to establish and run a successful K-12 Makerspace, including:

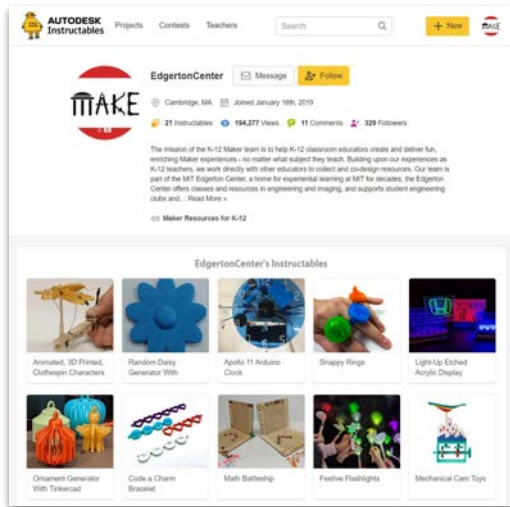
- Guides to Maker tools and software selection, operation and training
- Makerspace design guide
- Articles and books that make the case for Making in K-12 education
- Project ideas, instructions and inspiration
- Introduction to processes and tools for designing good Maker projects



We address this with:

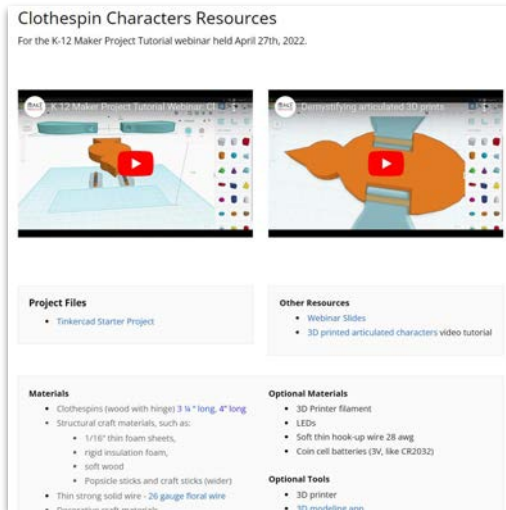
- Project inspiration and design resources that we publish online
- [Master Making in the Classroom](#) teacher professional development

K-12 Maker Project Ideas and Tutorials



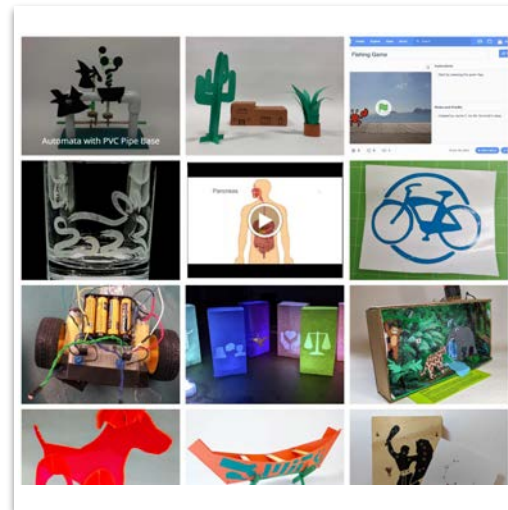
[instructables.com/member/EdgertonCenter/](https://www.instructables.com/member/EdgertonCenter/)

Step-by-step guides geared towards K-12 Maker educators, but enjoyable (and doable!) by anyone.



k12maker.mit.edu/webinars

Kind of like live instructables - free resources and recordings of project webinars with more coming in the future!



k12maker.mit.edu/ideagallery

Adaptable, inspirational Maker project ideas that have been shared by K-12 Teachers and Maker-Educators

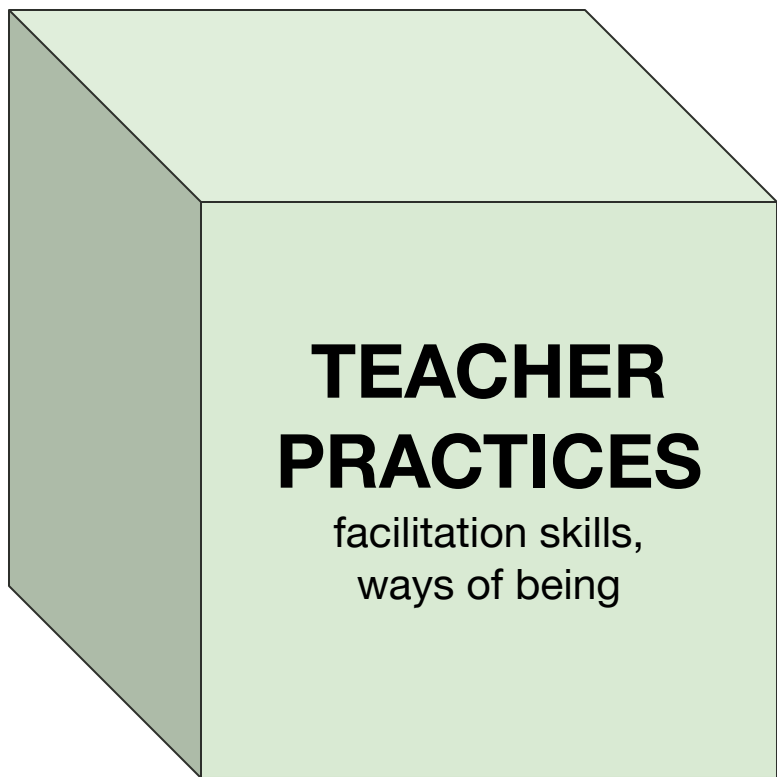
Master Making in the Classroom Teacher PD



10-week programs for Maker educators and leaders to master our [Maker Methodology](#) to design and deliver impactful and relevant Maker experiences.



k12maker.mit.edu/master-making-in-the-classroom

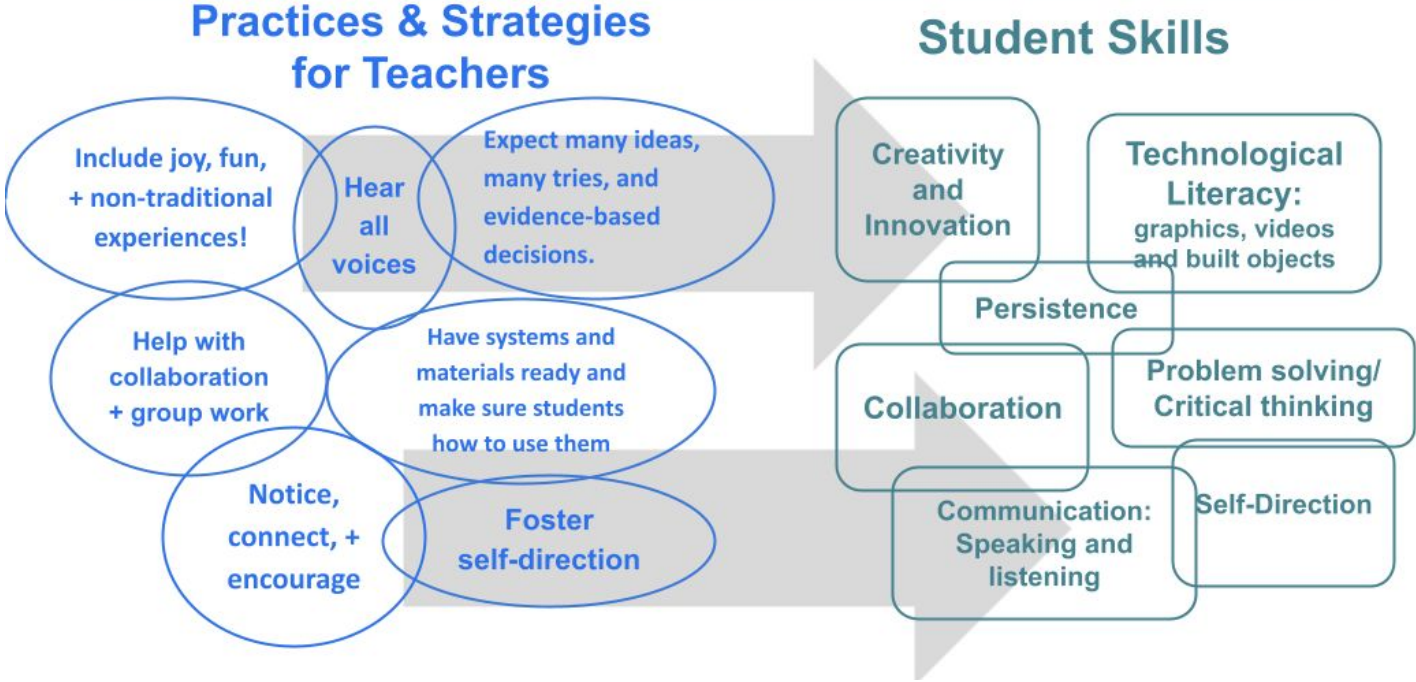


We address this with:

- [*Master Making in the Classroom*](#) teacher professional development

Maker Projects

What teachers do and the skills students develop



Become an excellent Maker project leader by learning practical and effective teaching practices in [*Master Making in the Classroom*](#)



Maker PD Packages

A year of coaching and professional development that is customized to meet the needs of your program, school or district.



Maker PD Packages starting at \$10,000 include planning, goals and needs identification, custom training and materials, connection to a network of K-12 Maker Educators, and more.

We meet with you to discuss your vision, identify goals, and explore how Maker projects and technologies bring your vision to life. We'll walk you through our PD strands and resources, including Makerspace design, tool training, project design, teacher practices, and lots more. We will work with you to choose appropriate strands and create a custom program.

Learn more at k12maker.mit.edu/pdpackages or contact us at k12maker.mit.edu to get started!

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