MAKER PROGRAM
STARTER KIT

MATH

Science

future ▶

A STEP-BY-STEP GUIDE TO LAUNCHING YOUR FIRST MAKER PROGRAM

THE FUTURE IS YOURS TO CREATE

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GO TO
STEP:

Hello!

AUTODESK.

Autodesk makes software for people who make things.

Across the manufacturing, architecture, building, construction, media and entertainment industries, Autodesk gives you the power to make anything.

GO TO STEP:

If you're thinking, "How cool! How do I get my students started?" this guide is for you.

GO TO STEP:

WELCOME TO THE WORLD OF MAKING!

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You spoke and we listened.
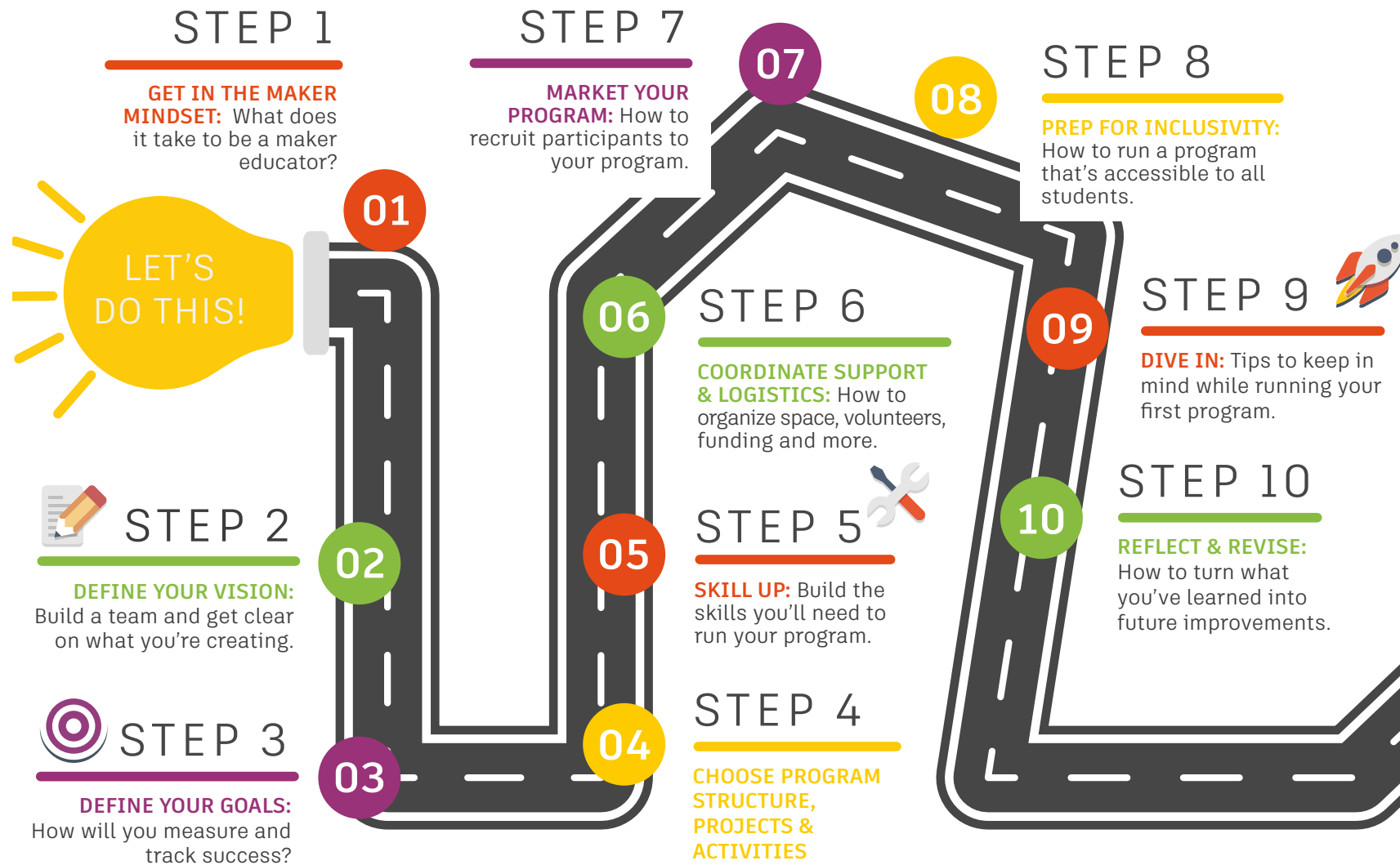# **This guide is for you!**

After hearing so many educators tell us, "I want to bring making into my classroom but I just don't know where to begin," we've put together a comprehensive, easy to follow, step-by-step guide to help you launch your first maker program. From defining your vision and goals to marketing, professional development, and reflection - it's all here to demystify the process and put you on a path to making something awesome!

Whether you're a teacher, parent, or youth leader, we hope you'll use this guide as a tool to spur your own creativity while also building game-changing experiences for learners.

Let's get started!

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GO TO STEP:

BUILDING A MAKER PROGRAM: WHO, WHAT, WHY AND HOW

HOW TO GET STARTED

This guide provides ten steps with eleven hands-on activities to guide you and your team through the process of developing and launching a maker program in your school, organization or community. The worksheets and templates referenced in this Starter Kit can all be found in the appendix and in a Google Drive folder. These resources are available for you to use and revise to suit the needs of your team.

As you are reviewing and working through all the fun steps and activities, remember that this guide is for your reference. The activity sheets/templates are licensed under the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License so feel free to remix, transform, or build upon the material - just be sure to follow the guidelines outlined on page 2.

The Maker Program Starter Kit is an actionable framework with step-by-step instructions to guide new maker educators through the process of building their first maker program.

GO TO STEP:

SO **WHAT** IS A MAKER?

A maker is a person who learns by doing; he or she embraces a "do it yourself" mindset with an emphasis on building original projects using both traditional and cutting-edge technologies.

If you're reading this guide, the term "maker" is probably familiar to you. Maybe you've attended a Maker Faire, dropped by a local makerspace, watched Dale Dougherty's TED talk, or read The Maker Movement Manifesto by Mark Hatch. Maybe you're an electrical engineer or maybe you crochet socks in your spare time. The bottom line is that there are many ways to be a "maker." **At Autodesk, we believe anyone can be a maker. With a little bit of imagination and the right tools you can make anything, you just have to try!**

WHAT IS MAKER EDUCATION?

Maker education means different things to different people. For some, it's an approach to teaching core subjects with an emphasis on project-based learning. As teacher and maker-education-evangelist Vicki Davis says, "Don't treat making as a sidebar to an already overtaxed curriculum." Instead, she advocates that making can be used as a powerful approach to teaching both STEAM and core subject matter. For others, maker education means helping learners build advanced expertise in the technical skills often overlooked by traditional education. People who ascribe to this approach may be more excited about teaching a specific skill set like coding, microelectronics, or 3D printing. Both interpretations of "maker education" are correct; your approach to maker education will depend on your unique situation and the resources available to you. The bottom line is this: **maker education transforms the passive model of consuming information into an active model for creating new ideas.**

Maker education is a hands-on approach to learning that creates opportunities for anyone to develop creative confidence while fostering interest and expertise in science, technology, engineering, art, design, and/or mathematics (STEAM).

GO TO
STEP:

> "We're teaching kids content and it's time to really teach kids how to think."
>
> – Abby Cornelius, Maker Educator and High School Librarian

Photo Credit: KIDmob

GO TO STEP:

WHY IS MAKER EDUCATION SO IMPORTANT?

Maker education gives people the opportunity to build skills and mindsets that will help them thrive in today's highly technical and creative workforce.

In a system that can feel overpowered by standards and testing, maker education is an approach to learning that fosters creativity and practical skill-building across the spectrum of K-12 content. This is important, because the modern economy is changing in some pretty big ways. Here are a few trends that play a role in the growing importance of maker education for young people around the world:

DIGITAL MANUFACTURING

"80 percent of manufacturers report a moderate or serious shortage of qualified applicants for skilled and highly-skilled production positions."

Source: Deloitte and the Manufacturing Institute

GROWTH OF CREATIVE WORK

"In 1900, creative workers made up only about 10% percent of the U.S. workforce….Today, almost 40 million workers– some 30 percent of the workforce–are employed in the creative sector."

Source: Richard Florida

DEMAND FOR FLEXIBILITY

"There has been a rapid increase in the use of online platforms by companies and individuals who want to engage remote workers for piecemeal, short-term or project-based work delivered over the internet."

Source: The Guardian

GO TO STEP:

"I hear and I forget. I see and I remember. I do and I understand."

-Confucius, 6th Century BC

GO TO
STEP:

The "4C's" - Creativity, Collaboration, Communication, and Critical Thinking - will be crucial competencies for 21st century jobs. These skills, however, will likely not be enough to ensure employment for today's youth. According to researcher Kevin Kelly, "You'll be paid in the future based on how well you work with robots." In short, specialized technical expertise paired with the 4C's will be a winning combination for employability in the 21st century.

Collaboration

Creativity
(Innovation)

Critical
Thinking

Communication

+

Technical
Specialization

=
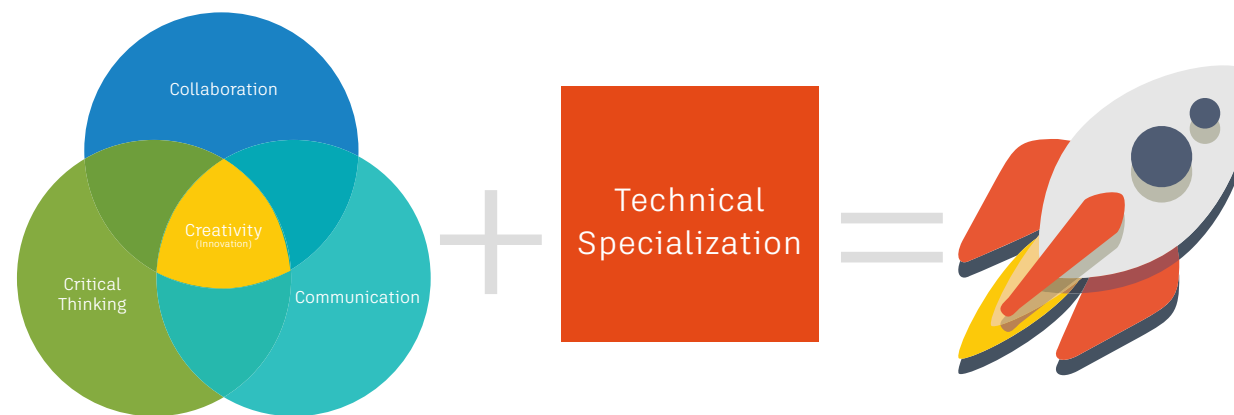
LEARN MORE ABOUT "THE FOUR C'S"
Check out P21's Framework for 21st Century Learning at http://autode.sk/P21framework

"THE FOUR C'S"
Download the NEA's "An Educators Guide to the 'Four C's'" at http://autode.sk/NEA4cs

In this section, we'll outline four specific (and powerful) ways maker education helps build the skills that will be most valuable in today's rapidly-changing global economy:

1. Engagement
2. Self-Direction & Learning to Learn
3. Deeper Learning
4. Technical Specialization

GO TO STEP:

By encouraging students to seek answers to their own questions and modeling ways to effectively source and vet information, maker educators can help learners build confidence in their capacity for independent learning.

Photo Credit: Libby Falck

GO TO STEP:

ENGAGEMENT

By its nature, maker education is active, collaborative, cooperative and often project-based. Researchers have been studying the effects of active learning since the 1960's; these approaches have been shown to improve knowledge retention and student engagement. Even the ancient philosophers knew this. A little more recently, researchers at Harvard's Derek Bok Center of Teaching and Learning shared that, "Active learning pedagogies have been found to provide a significant advantage over passive approaches in terms of acquiring subject matter knowledge and academic skills."

MORE ABOUT ACTIVE LEARNING
http://autode.sk/ActiveLearning

[S]tudents who are thus reputedly poor in mathematics show an entirely different attitude when the problem comes from a concrete situation and is related to other interests." - Jean Piaget, 1973

In short, we learn best when presented with active, hands-on activities that are relevant to our lives. Maker education does exactly this.

The increased student engagement enabled by maker education is particularly noteworthy because it benefits all learners. Many maker programs focus on preparing students for jobs in advanced STEAM fields. That's great, but the benefits provided by active learning approaches in maker programs are particularly special because they have the potential to help all students master content more effectively, regardless of whether those students choose to enter a STEAM field or build careers in business, human services or the humanities. Maker education is a fantastic way for all students to learn.

As the authors of Invent to Learn explain, "Maker classrooms are active classrooms. In active classrooms one will find engaged students, often working on multiple projects simultaneously, and teachers unafraid of relinquishing their authoritarian role. The best way to activate your classroom is for your classroom to make something."

INVENT TO LEARN
Published in 2013, this book by Sylvia Libow Martinez and Gary Stager is one of the most popular resources on maker education and active learning.

GO TO STEP:

THE IMPACT OF MAKING

Giving students real-world problems to solve is a powerful way to motivate learning.

This working prototoype of a piezoelectric footsole was created by a team of high school students in The Resilience Challenge, a 9-week program that teaches sudents to use design and technology to solve civic challenges. The prototype can charge cell phones using the pressure of your steps.

Photo Credit: Libby Falck

GO TO STEP:

LEARNING TO LEARN

In our rapidly-changing world, learning to learn may be one of the most important competencies for youth to develop. Maker education programs excel at enabling students to pursue their own learning. The role of a maker educator is often less about providing technical training than it is about coaching. Maker educators are in a unique position to foster a love for learning and to help participants navigate the resources and possibilities available in the many fields of "making."

DEEPER LEARNING

Increasingly in the twenty-first century, what you know is far less important than what you do with what you know. - Tony Wagner

As described by researcher James Pellegrino, deeper learning allows students to "use knowledge in ways that make it useful in new situations." This ability to repurpose information is key to innovation and creativity. Maker education encourages learners to experiment, prototype and explore new connections between diverse ideas. Makers are people who not only possess technical skills, but are also able to utilize their knowledge to address problems in unique ways.

TECHNICAL SPECIALIZATION

As outsourcing and automation increasingly eliminate middle-skill jobs, today's workers must develop specialized expertise to compete in the global knowledge economy, particularly in technical fields. Maker education is a fantastic way to quickly introduce learners to a variety of STEAM skills. This exposure can help learners identify their individual interests and aptitudes and begin specializing at a young age. For example, online portfolios are increasingly used by college admissions boards and employers to identify promising candidates. As a Maker Educator, you can also help your students learn the importance of documenting their work for these purposes.

"Learning to learn is to know how to navigate in a forest of facts, ideas and theories, a proliferation of constantly changing items of knowledge. Learning to learn is to know what to ignore but at the same time not rejecting innovation and research."

-Author Raymond Queneau

MEASURING DEEPER LEARNING
KQED's Mindshift team wrote about ways to define and measure deeper learning at http://autode.sk/ MeasureDeeperLearning

GO TO STEP:

WHO SHOULD USE THIS GUIDE?

This guide and its accompanying resources are designed to support educators and youth organizers interested in creating new opportunities to engage with making. This can be accomplished in a classroom setting, as an extracurricular or after school program, as part of a summer camp, at a library, in combination with home schooling curriculum, or in a wide variety of other settings. The options are endless!

You do not need to be an expert technologist or seasoned maker to take on this challenge; in fact we recommend only four prerequisites:

1 Experience and interest in working with youth.

2 Love for learning new skills and an understanding that failure is part of the learning process.

3 Organizational and problem solving skills necessary to run a classroom or extracurricular program.

4 Willingness to embrace the maker culture.
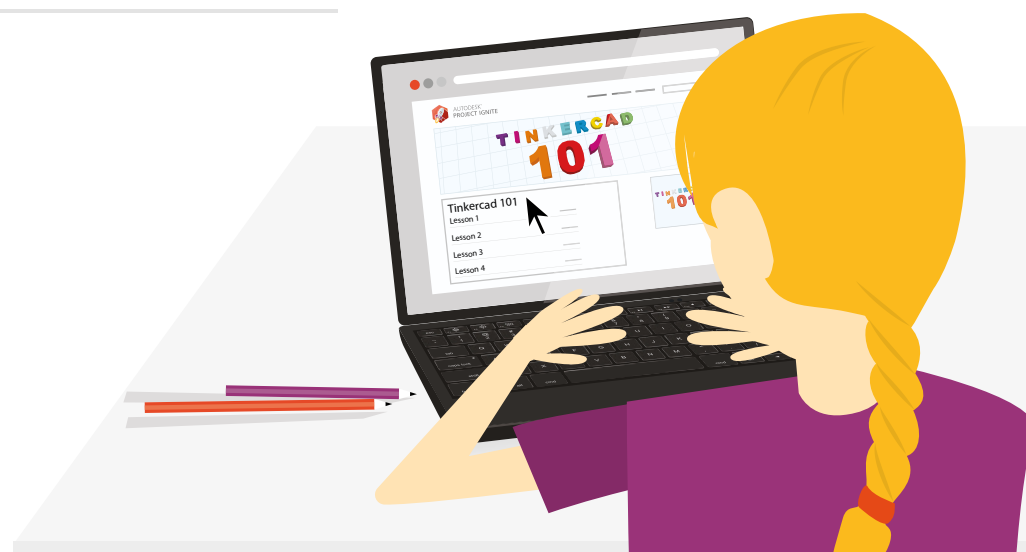
At Autodesk Education, we believe making can change the world.

Since 1982, Autodesk has been in the business of making software for people who make things. If you've ever driven a high-performance car, admired a towering skyscraper, used a smartphone, or watched a great film, chances are you've experienced what millions of Autodesk customers are doing with our software. Autodesk gives you the power to make anything.

As an educator, you have tremendous capacity to inspire your students, and we want to show you how making can help inspire a love of design and a desire to learn that will cultivate and enrich your students' creativity and future careers.

Whether you're a beginner looking for simple exercises, a seasoned maker searching for a new challenge, or a teacher in need of class materials, this guide has something for you. We believe these tools will make it possible for the next generation of designers, engineers, architects and entrprenuers to imagine, design and create a better world.

ABOUT AUTODESK EDUCATION
http://www.autodesk.com/education

WHAT IS THE "FUTURE OF MAKING THINGS?
http://autode.sk/FutureOfMakingThings

GO TO
STEP:

STEP 1
GET IN THE MAKER MINDSET

GO TO STEP:

STEP 1: GET IN THE MAKER MINDSET

So you understand that maker education is important and you're excited to get started. What now?

We know that starting a maker program can be intimidating. Perhaps you're a rockstar educator and technical genius with no doubts about your ability to launch a maker program (if so, go get 'em!), but it's more likely that you're a little bit unsure how to go about this. Don't worry, you're not alone. Feeling unprepared and uncertain about how to build your first maker program is normal. That's why the first thing you should know is this:

Whether you're a classroom teacher, librarian, scout leader, or parent - as long as you enjoy working with kids (and are into making things) - you can run a maker program.

To explain why, let's clear up some common misconceptions about what a maker educator is **not**. Running a maker program does not mean:

- You're a math whiz
- You're an engineer, physicist, or architect
- You're a programmer
- You can take an engine apart and put it back together again
- You water your plants with an Arduino-controlled robot (or even know what an Arduino is)

To put it simply, you do not need to be an expert technologist to run a maker program.

A maker educator is a coach who inspires learners to build technical skills and creative mindsets through hands-on projects and experiential learning.

At the core, it's really that simple. To help give you a better picture of what this looks like in practice, let's dig into some of the many hats you'll wear as a maker educator...

You can do this

GO TO STEP:
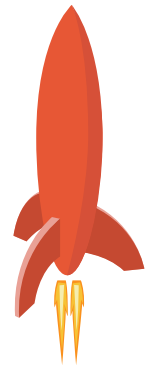
THE MAKER EDUCATOR, AKA "HAT JUGGLER"

As a maker educator, you'll wear many hats:

You'll be a Coach.
The primary hat you'll wear as a maker educator is that of a coach. This means you'll provide structure, motivation, materials and a safe environment that, together, enable your participants to thrive. You'll help your students set goals and deadlines and provide them with context for the skills they're building in your program.

You'll be a Cheerleader.
A key component of the maker mindset is a willingness to try new things and fail. This can be very difficult for some students to get used to. You can help your students feel excited about failure by reframing it as learning. Keep a positive attitude toward problem solving. Most importantly, have fun.

You'll be a Learner.
Even if you have technical expertise in one area or another, at some point your students will want to tackle something you've never done before. That's great! Put your Learner Hat on and try to let your students lead the way in tackling this new and tricky challenge. The idea of "learning to learn" is core to making. If the students need support, learn alongside them.

You'll be a Questioner.
You can help your students "learn to learn" by encouraging them to search for their own answers before coming to you. One great way to do this is to ask questions. For example, if a student is stuck, think of the steps you'd take to answer the question if you were in the student's position. Has the student taken any of those steps? If not, you can encourage him or her to do so before you volunteer a solution. This approach helps learners build confidence in their ability to learn independently.

You'll be a Connector.
Another hat you'll often wear is that of a connector. If you're a librarian, this will come naturally to you. As a connector you will help your students discover resources and people to accomplish their learning goals. For example, if a student has progressed into advanced territory in the Python programming language, perhaps you can connect her with a professional computer scientist in your trusted community who can answer her questions. You might alternately recommend online resources, books or other materials to help her advance.

Finally, Yes, You'll be a Teacher.
As we'll discuss in more detail in Step 4, there are many ways to structure and facilitate a maker program. No matter how you choose to run yours, you can expect to deliver some level of instruction. This is particularly true for young learners. To prepare, make sure you've gone through each activity at least once and are familiar with software and equipment basics. If you have questions, ask friends, colleagues or consult one of the many online maker communities before your lesson begins.

The most important thing to remember when teaching is this: if a question comes up during instruction that you can't answer, that's okay.

You and your students can find the answer together. It's likely that your students will often surprise you with their existing knowledge. Peer teaching is an invaluable tool for the maker educator. The best outcome you can hope for is to create an environment where everyone feels comfortable taking turns between teaching and learning. The gaps you'll encounter in your own knowledge present a fantastic opportunity to model this behavior.
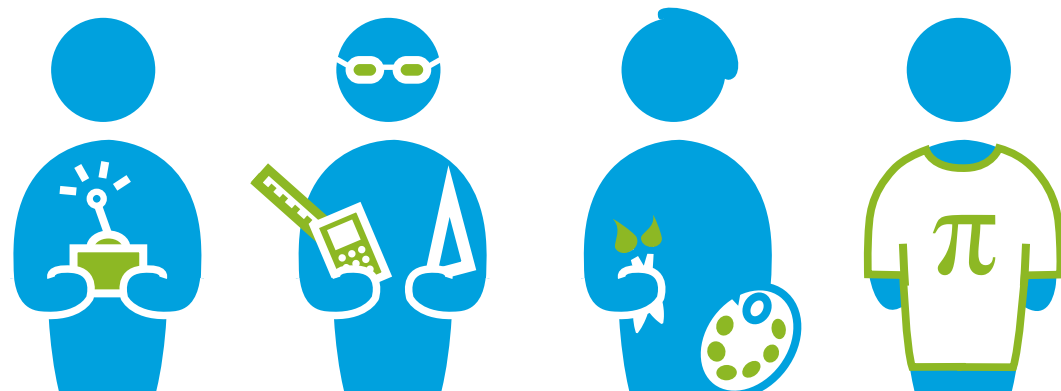
GO TO STEP:

EMBRACE THE MAKER MINDSET

Here's a secret: you can't "teach" making like you can teach other subjects. There are no right answers, no clear paths, and there are no comprehensive experts. No single individual could master every tool and technique that might fall within the realm of "making." This is why, more than anything, making is a mindset.

The first thing you'll have to do as a maker educator is embrace this maker mindset yourself. To do so, keep the following in mind:

1. Be willing to try new things.
2. View mistakes with a positive lens; they are opportunities for learning.
3. "I can learn anything!" Embrace a growth mindset.
4. Be willing to say, "I don't know, let's find out!"
5. Be creative in seeking answers to tricky problems.

LEARN MORE ABOUT GROWTH MINDSET
Check out Stanford Psychology Professor Carol Dweck's research at
http://autode.sk/GrowthMindset

If you find yourself feeling overwhelmed, remember this:

Everyone gets overwhelmed. You're trying something new. It's worth it. Keep calm and try a different hat.

GO TO STEP:

CREATIVITY takes COURAGE

- HENRI MATISSE

GO TO STEP:

STEP 2
DEFINE YOUR VISION

GO TO STEP:

STEP 2: DEFINE YOUR VISION

"Making" can mean many things. What does it mean to you?

Your maker program will be shaped by the people creating it and the resources you have access to in your unique community. Your next step will be to define the type of program you're building. What do you imagine it will look and feel like for students? Who are your students? How long will the program last? Why is building this program important to you? These are critical questions for your team to discuss at the beginning of this process. Even if you're building your program single-handedly, taking the time to clearly outline your goals early-on will prove invaluable as you move forward. Although the vision you craft now will undoubtedly change over time, laying it out will make the following steps easier to achieve and future changes simpler to communicate.

The following three activities are designed to help you and your team agree on an initial vision for your program.

GO TO STEP:

Activity 1 : Get Sticky with Group Brainstorming

ACTIVITY 1: GET STICKY WITH GROUP BRAINSTORMING

This simple brainstorming activity is designed to build alignment and vision within your program design team. Although best conducted with a group of 2-8 people, this can also be useful as a solo exercise. You'll be using the brainstorming process and rules developed by the Stanford Design School (the d.school) to facilitate this activity.

GET THE STANFORD D.SCHOOL RULES FOR BRAINSTORMING
http://autode.sk/ StanfordBrainstorming

TIME: 20 minutes
PEOPLE: 3-8
MATERIALS: Post-it Notes, Markers, Timer

1 Introduce the activity. If anyone on your team is unfamiliar with the brainstorming process, take a few minutes to introduce the rules. Remind participants that, at this stage, all ideas are good ideas!

2 Distribute a sharpie marker and pad of post-it notes to each participant.

BRAINSTORMING QUESTIONS:
· What are you most excited about with this program?
· What does success look like (in the context of your maker program)?
· What are your biggest concerns about this program?
· Quickly sketch a logo or name for your program.
· What is your program's "secret sauce" (what makes it special)?

GO TO STEP:

3 Brainstorm answers to each of the questions one at a time. The tone of the activity should be fun and fast-paced. Use a timer to limit the amount of time spent on each question - we recommend 90 seconds per question. Feel free to add your own questions! For each question, proceed as follows:

a Introduce the question. Remind participants to only write or sketch one idea per post-it note and to come up with as many ideas as possible.

b Set a timer for 90 seconds and invite the team to begin brainstorming. Note: after a few trial rounds, you might try variations like a silent round (no talking) or a visual round (pictures only).

c When the timer buzzes, have everyone finish their current idea and set down their markers.

d Go around the table to share key ideas. Once everyone has shared, group similar ideas together on the table or an empty wall (as a variation, this can also be done as a silent activity).

4 After you've finished brainstorming each question, take five minutes to debrief by highlighting similarities and differences in the group's vision for the program.

5 Take pictures of your brainstorming results and note key findings before cleaning up.
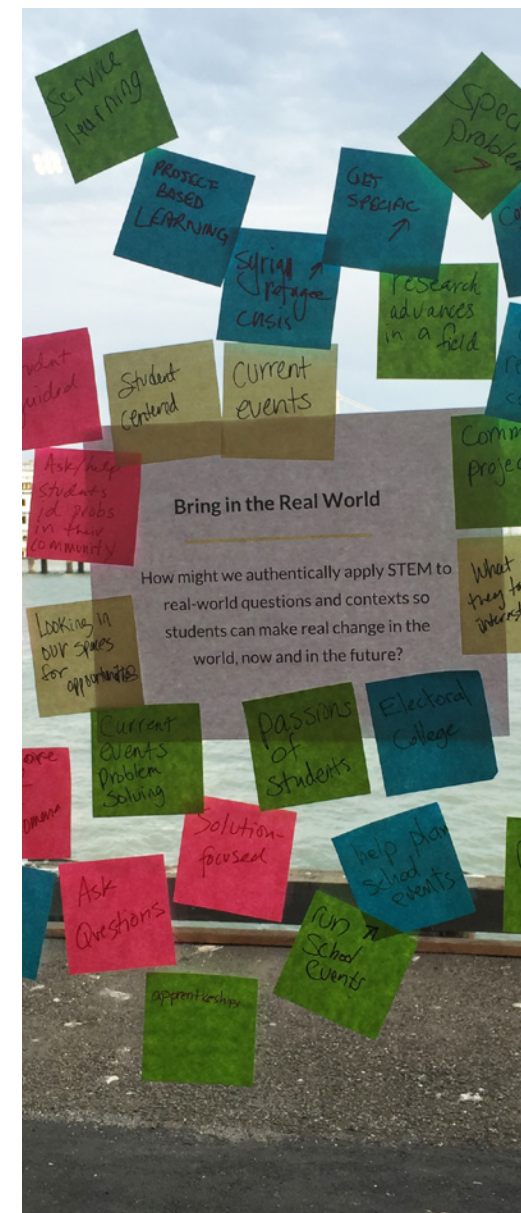
GO TO
STEP:

Activity 2 : Maker Strengthsfinder

ACTIVITY 2: MAKER STRENGTHSFINDER

This activity is designed to help you identify potential strengths in your team and program. You'll walk through eight categories to inventory your existing skills, assets, equipment, and materials. You'll then generate a "score" for each category that will enable you to compare yours strengths across all categories. At the end of this activity you'll have a better idea where to start when you begin selecting curriculum and activities for your program.

Here are the categories:

| 3D DESIGN & PRINTING	TEXTILES	ELECTRONICS
Including additive manufacturing and computer-aided design (CAD)	Including sewing, leatherworking, and e-textiles	Including circuits, sensors, robotics, Arduino, Raspberry Pi, Makey Makey and more
CODING	**DIGITAL MEDIA**	**GENERAL FABRICATION**
Including programming for software, web, apps, microcontrollers and videogames	Including video and audio production, photography, and animation	Including subtractive manufacturing, metalwork, woodwork and lo-fi prototyping
GRAPHIC DESIGN	**SPACE & STORAGE**	
Including wireframing, data visualization, and design for print, web, and media	We'll also review requirements for space and storage.	

TIME: 20 minutes
PEOPLE: 1-10
MATERIALS: Maker Strengthsfinder Worksheet (print one-sided), Markers

TAKE NOTE

You alone are responsible for your maker program! Starter Kit resources are provided under a BY-NC-SA Creative Commons license. See pg. 2 for more information.
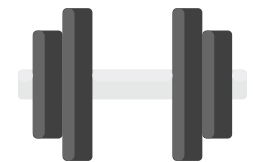
MAKER STRENGTHSFINDER WORKSHEET

This is a Maker Program Starter Kit Resource, available in the appendix and on Google Drive.

GO TO STEP:

Activity 2 : Maker Strengthsfinder

1 Each of the eight maker categories is listed on a separate page in the Maker Strengthsfinder Worksheet. Lay all nine pages out on a table or tape them to a wall so all participants can easily view them.

2 Distribute markers to participants. Each person should have a different color.

3 Introduce the activity to the group and make sure everyone understands the instructions. Each person is going to place check marks next to the skills or resources your program has access to.

    a **You can place multiple check marks beside items listed under the Facilitator Skills column.** For example, if four people are completing the activity and you all have experience using a 3D printer, you should have four different-colored check marks beside that item in the Facilitator Skills column.

    b **You should only place one check mark beside items in the Resource columns** (basic, intermediate and advanced), as these resources will likely be shared by your team. For example, you should not have four check marks beside "drone" if you only have one drone.

4 Next, invite participants to add any relevant skills or resources that aren't listed. Write these in the best-fitting category.

5 Finish by using the formula included in the worksheet to calculate a "score" for each category. Anything over 0% is a win!

GO TO STEP:

Activity 2 : Maker Strengthsfinder

MAKER PROGRAM
STARTER KIT

Strengthsfinder Worksheet

Use this worksheet to identify your program's potential strengths. We'll go through nine categories of technology and resources you might integrate into your program and find the best place for you to begin. **For each category, check the assets you have access to. Check all that apply, even if they seem repetitive.** Next, add any relevant skills or resources that *aren't* listed in the best-fitting category. Finish by using the below formula to calculate a "score" for each category. Anything over 0% is a win!

Facilitator Skills *Expertise and/or professional development necessary to teach this skill*		Basic Resources *Essential resources to get started*		Intermediate Resources *Helpful resources to continue advancing (starting to get fancy)*		Expert Resources *Advanced resources to dig deeper (expensive and/or highly technical)*		Score
❑		❑		❑		❑		
Number of facilitator checks:		Number of basic checks:		Number of intermediate checks:		Number of expert checks:		**TOTAL** ↓
x5	*Multiply the above number by 5:*	**x3**	*Multiply the above number by 3:*	**x2**	*Multiply the above number by 2:*	**x1**	*Rewrite the above number:*	*Add the four products to the left:*
						Divide the total by [a given number for each section] and multiply by 100% to get your score:		

After completing each section, transfer your scores here to compare your strengths:

%							
Space for Teaching & Storage	3D Design & Printing	Textile	Electronics	Coding	General Fabrication	Digital Media	Graphic Design

GO TO
STEP:

GO TO
STEP:

Activity 3: Document Your Vision

ACTIVITY 3: DOCUMENT YOUR VISION

Now that your team has completed some basic brainstorming and identified its strengths, it's time to get your ideas down on paper and begin documenting the vision for what you want your program to be. This worksheet will you help you begin to hone in on the details in a way that will help you tell a more cohesive story about your program vision and foster cohesion within your team throughout the remaining process of building your program. A clearly defined vision will also make explaining and building buy-in much easier and more effective.

TIME: 30 minutes
PEOPLE: 1-8
MATERIALS: Printed "Document Your Vision" Worksheets, pens or pencils, timer

DOCUMENT YOUR VISION WORKSHEETS
This is a Maker Program Starter Kit Resource, available in the appendix and on Google Drive.

1   Distribute a Document Your Vision Worksheet to each person on your team. (You should have one extra copy of the worksheet on hand as well.)

2   Set a timer for 10 minutes and have each person individually fill out their worksheet. No talking! Alternately, these can be completed in advance.

3   Go around the table allowing each person to briefly share his or her answers. For smaller groups, you can also simply swap worksheets.

4   Corroboratively complete a new worksheet as a team. Find consensus on as many questions as possible.

5   After you've completed this activity, keep this document on hand for your team. Especially if your team meets infrequently, you can review this worksheet at the beginning of meetings to promote cohesion within the team and remind everyone of your shared purpose. Feel free to change and add detail to your answers as you advance in designing your program.

GO TO STEP:

Activity 3: Document Your Vision

MAKER PROGRAM STARTER KIT

Document Your Vision

Program Name _____   Your Name _____

Use this worksheet to outline the core details of your program. Use the left column to detail what you can do in the next six months and the right column to create a vision for five years from now. Remember, there are no right answers and this will undoubtedly change over time. Answer as thoroughly as possible.

Your 1-Year Vision *Use this column to answer each question based on a program you could* **launch within the next 6 months**.	**Your 3-Year Vision** *Use this column to answer each question based on your long-term vision for your program.*

Participant Ages:

Circle any/all features that apply to your target audience. Feel free to add to this list.

Girls-only Boys-only high-risk affluent beginners experienced techies low-income physical disabilities learning disabilities	Girls-only Boys-only high-risk affluent beginners experienced techies low-income physical disabilities learning disabilities

1-2 sentence summary of the populations you'll serve:

PG 1 of 4

GO TO STEP:

STEP 3

DEFINE GOALS & METRICS

GO TO STEP:

STEP 3: DEFINE GOALS AND METRICS

Identifying what success looks like for your program early-on is important for everyone. Even if you're putting your maker program together purely for fun, setting a few goals to track along the way will prove valuable when you're designing and recruiting for your next program. Collecting and sharing this data can also help grow your program, engage sponsors and parents, recruit new members, and successfully apply for grants in the future. Becoming a local exemplar for maker education is a sure way to reach more students and increase your impact. **Good data drives it all. This section will help you identify easy ways to track success.**

A NOTE ON STANDARDS

If you're a teacher in a K-12 school, one of the goals you may wish to work toward is alignment with your school's standards. Fortunately, many maker activities now include lists of the Common Core State Standards (CCSS) and Next Generation Science Standards (NGSS) addressed in their content. With a little creativity, you can align maker activities to a wide variety of core subject areas and standards.

GO TO STEP:

GO TO
STEP:

SURVEY TEMPLATES
FOR TRACKING SUCCESS

Track participant progress with periodic benchmark surveys that can be completed at the beginning and end of your program, or more frequently.

Track your own progress with periodic benchmark surveys that can be completed at the beginning and end of your program, or more frequently.

Use this form after each program class/session to record stories and observations. This will enable you to quickly review the flow of the program at its conclusion.

Never forget your exit survey! Get feedback and suggestions from your participants.

Participant Benchmarks

* Required

First Name *

Your answer

Last Name *

Your answer

Which of the following terms are familiar to you (you could explain their meaning to someone unfamiliar with the term). *
Check all that apply:

☐ Design thinking

☐ Microelectronics

☐ Arduino

☐ Raspberry Pi

☐ Making

☐ Saddle stich

☐ Soldering Iron

☐ 3D printer

Educator Benchmarks

As a maker educator, you will learn new skills and gain confidence as you facilitate your program. Use this form to capture your progression. This can be a useful tool to help document and share "wins" with your team at the conclusion of your program.

* Required

Name

Your answer

Which of the following terms are familiar to you (you could explain their meaning to someone unfamiliar with the term). *
Check all that apply:

☐ Design thinking

☐ Microelectronics

☐ Arduino

☐ Raspberry Pi

☐ Making

☐ Saddle stich

☐ Soldering Iron

☐ 3D printer

☐ CAD

Educator Observations Form

Use this form weekly or daily to track your observations throughout the program.

Today's Date

Date

mm/dd/yyyy

Current Time

Time

:   AM ▼

Attendance

Your answer

How many times did you celebrate failures and successes with participants today?

0   1   2   3   4   5   6   7   8   9   10

None ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ 10+

How did you celebrate failures and successes today?
Is there a story you'd like to remember from today?

Participant Post-Program Survey

Please fill out this form to share your anonymous feedback about our program.

* Required

How would you rate your overall experience with the program? *

1   2   3   4   5   6   7   8   9   10

Worst ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ Best

Share the degree to which you agree or disagree with the following statements:

The program was well-organized. *

1   2   3   4   5   6   7   8   9   10

Disagree ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ Agree

I had fun during the program. *

1   2   3   4   5   6   7   8   9   10

Disagree ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ Agree

I learned a lot during the program. *

1   2   3   4   5   6   7   8   9   10

GO TO STEP:

Activity 4: Brainstorm for Success

ACTIVITY 4: BRAINSTORM FOR SUCCESS

This activity is designed to help your team identify the metrics you will track to know whether or not your program was successful in meeting its goals.

TIME: 30 minutes
PEOPLE: 1-8
MATERIALS:
· Post-in notes and markers
· (1) Printed Indicators of Success Worksheet
· Whiteboard, chalkboard or large sheet of butcher paper
· If available, your completed Document Your Vision Worksheet from Activity 3 and post-it notes from Activity 1

INDICATORS OF SUCCESS WORKSHEET
This is a Maker Program Starter Kit Resource, available in the appendix and on Google Drive.

1 Begin by introducing the activity and reviewing the same brainstorming rules used in Activity 1.

2 As a group, briefly review your work from Step 1, including: a) Your answers to the "What does success look like?" question in your initial brainstorm, and b) the "Indicators of Success" portion of your team's final Document Your Vision Worksheet.

3 Now spend 3 minutes brainstorming as many answers as possible to the following question: What are our goals for success in your program?

4 Group and sort these goals and themes by moving similar goals next to each other. Are you noticing any trends? Use your grouped post-its to **identify up to five primary "indicators of success" for your program**. These can be relatively vague; for example: "participants have fun" or "students build 3D modeling skills." They can also be specific; for example: "75% of participants complete the program"

GO TO STEP:

Activity 4: Brainstorm for Success

5 Now you'll run **another 90-second brainstorm for each indicator** of success with the following questions: **How will we know we've succeeded?** Specifically, what can you do, capture, test or observe to prove that you achieved your goal? Be creative; there are no right or wrong answers.

6 On a whiteboard or a large piece of butcher paper, draw three quadrants. Label them "Must," Might" and "Later."Now sort all the methods you identified in your brainstorms for each Indicator into the following categories:

- Must: important and easy to achieve
- Might: metric is important but the method difficult to achieve
- Later: metric is less essential to immediate success

7 Choose 1-2 methods from the "must" category to track for each of your important indicators. If one of your indicators doesn't have any methods that land in the "must" category, consider putting it aside for future consideration.

8 Use the Indicators of Success Worksheet to assign responsibility for each method and document progress throughout the program.

GO TO
STEP:

Activity 6: Brainstorm for Success

MAKER PROGRAM STARTER KIT

Indicators of Success Worksheet

Use this worksheet to clearly define what success looks like for your program and how you will track it. State each indicator of success in a complete sentence and outline the methods you will use to track your progress. **Be as specific as possible**.

Summary of Results:

	Method 1	Method 2
Indicator 1: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		
Indicator 2: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		
Indicator 3: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		
Indicator 4: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		
Indicator 5: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		

GO TO STEP:

STEP 4

CHOOSE STRUCTURE & ACTIVITIES

GO TO STEP:

STEP 4: CHOOSE STRUCTURE, PROJECTS AND ACTIVITIES

Makerspaces are not just about tools; they're about people, culture and mindset.

This section will help you choose a program structure and content to best fit the needs of your space, community, learners and team.

INSTRUCTIONAL APPROACHES

Depending on your unique circumstances, there are a variety of ways your maker program can be organized. On the next page you'll find a breakdown of common models we've seen over the years, but there's always gray area when it comes to making. Some programs may be combinations of the following models or completely different (literally "off the chart," you might say!). We offer this table as a tool to begin to define the structure for your program.

TYPES OF MAKER PROGRAMS:

	Project-Based	Design-Based	Technical	Drop-In
Description	Project-based programs enable students to master a specific set of technical skills by completing a hands-on project.	Design-based programs focus on enabling students to improve creative problem solving skills by tackling a real-world issue; building technical skills is a secondary goal.	Technical Programs enable students to master a specific set of technical skills, in depth.	Drop-In programs enable participants to explore a range of technical skills in a relatively unstructured environment.
Strengths of Approach	Project-based learning can be more engaging for "nontechnical" participants; Good for beginners; Great for elementary students	Design-based learning can be more engaging for "nontechnical" participants; Great for high school students	Attractive to parents; Attractive to learners with existing interest in technology; students may have greater intrinsic motivation to participate; Structured progression makes technical programs easier to plan	Creates space for self-motivated students to explore; Good for high school students
Weaknesses of Approach	Tying together multiple "beginner" projects with a common theme can be difficult	Addressing a real-world problem often requires a program of longer duration	Technical expertise required of instructors; Difficult to engage learners who don't have an existing interest in the technology; Depending on technology, can be more expensive than other program types	Difficult for younger students; Unstructured environments can be overwhelming for some students; will not effectively serve learners who struggle with self-direction
Hours of Instruction	4-80 hours	8+ hours	2-30 hours	N/A - open/flex hours
K-8 Program Example	**WIKISEAT** Build customizable chairs with learners of all ages. WikiSeat is an open source furniture project. That means that all of the documentation for how to build a WikiSeat is freely and openly published online. www.wikiseat.org/	**SUPERHERO CYBORGS** Superhero Cyborgs is KIDmob's build your own body mod workshop for kids ages 10-15 with limb differences. Kids work with designers and engineers to design and prototype their own body modifications. kidmob.org/superhero-cyborgs/	**TINKERCAD** Tinkercad offers step-by-step digital lessons in 3D design that are common-core aligned and suitable for learners as young as first grade. https://www.tinkercad.com/	**HOUR OF CODE** The Hour of Code is a global movement reaching tens of millions of students in 180+ countries. Anyone, anywhere can organize an Hour of Code event. One-hour tutorials are available in over 45 languages for all ages. https://code.org/learn
9-12 Program Example	**BUILD A PLAYGROUND** The 1881 Institute in New Orleans trains students to design and build a playground. http://autode.sk/1881school	**YOUTH CIVIC HACKATHON** Civic hackathons challenge groups of teenagers to spend a weekend using design and technology to solve civic challenges. Read about San Francisco's first Youth Civic Hackathon, hosted at Tech Shop SF: http://autode.sk/YouthCivicHackathon	**AUDIO: BUMP RECORDS** Participants in this program at the Bay Area Video Coalition (BAVC) learn audio engineering, digital recording and mixing techniques. http://autode.sk/BAVCyouth	**THE MIX** The Mix at SFPL is an innovative, youth-designed, 21st century teen learning space that will provide 4,770-square feet of space and equipment for youth ages 13-18 to explore, create and develop digital media and computer skills as well as discover and engage with the Library's traditional books and materials. themixatsfpl.org/
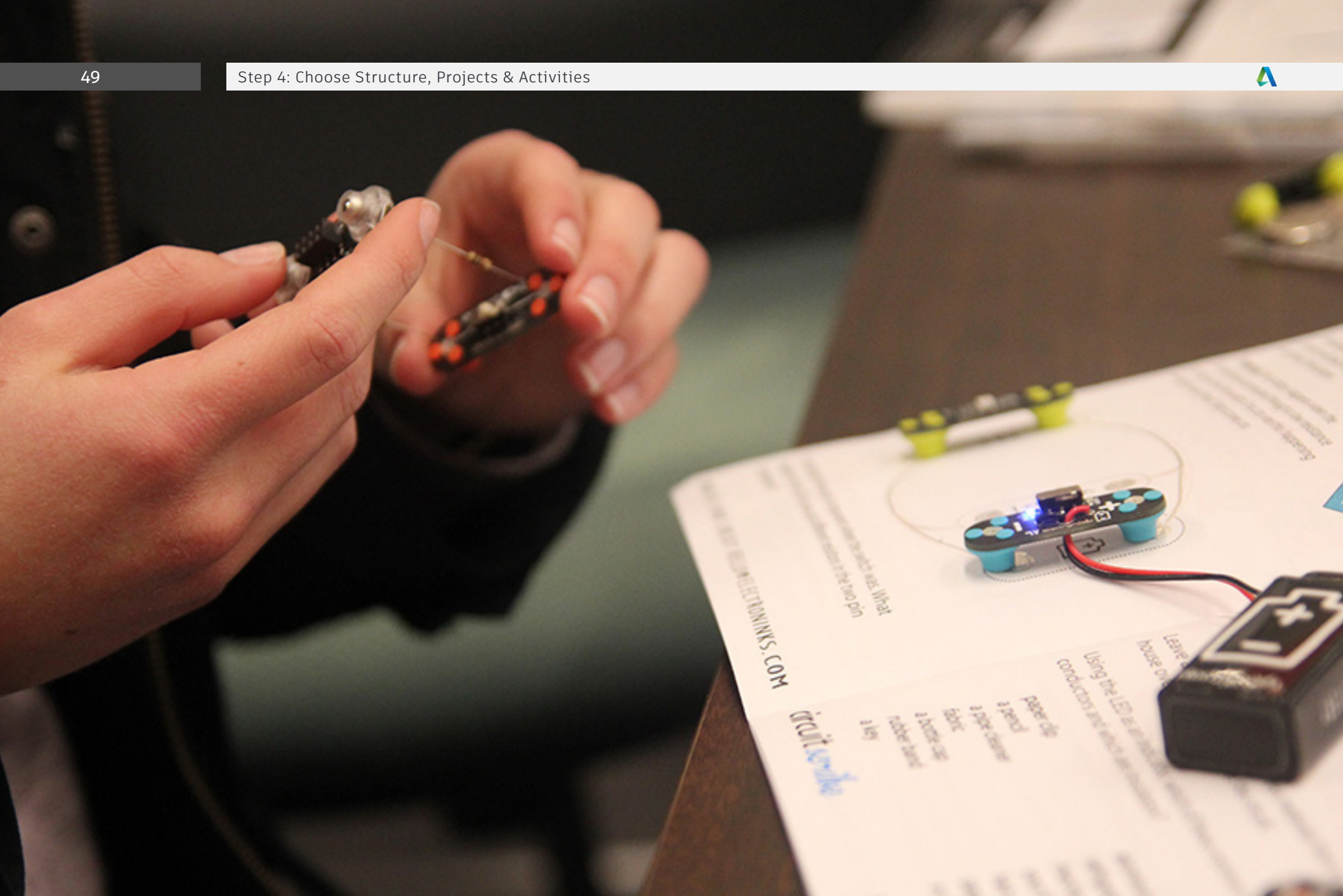
GO TO STEP:

Activity 5: Map Your Learner Journey

ACTIVITY 5: MAP YOUR LEARNER JOURNEY

Before you begin selecting specific activities for you program, it's important to clearly outline the experience your participants will move through as they progress. How will they feel on the first day? On the last? When might they be frustrated? Excited? Defining exactly when participants will master different mindsets and skills and how they'll feel along the way will help you choose the appropriate activities and structure for your program. This activity will help you map your participants' intended progression throughout your program, including their skill development, behavior, attitudes and more.

TIME: 30 minutes
PEOPLE: 1-4
MATERIALS: Learner Journey Worksheet and pens or pencils

Use the Learner Journey Worksheet to map the path your students will take.

TAKE NOTE
You alone are responsible for your maker program! Starter Kit resources are provided under a BY-NC-SA Creative Commons license. See pg. 2 for more information.

LEARNER JOURNEY WORKSHEET
This is a Maker Program Starter Kit Resource, available in the appendix and on Google Drive.

GO TO STEP:

MAKER PROGRAM STARTER KIT

Learner Journey Worksheet

Describe the experience of a learner as he or she advances through your program:

	BEFORE PROGRAM	AFTER FIRST CLASS/SESSION	HALFWAY POINT	AFTER LAST CLASS/SESSION	ONE YEAR LATER
LEARNER SAYS Describe what you hope learners will be talking about at this stage.					
LEARNER DOES Describe action or behaviors you hope to see at this stage.					
LEARNER FEELS Describe the learner's attitude toward making at this stage.					
LEARNER KNOWS Describe key milestones in skill development and understanding for this stage.					

GO TO STEP:

Activity 6: Explore & Choose Activities

ACTIVITY 6: EXPLORE AND CHOOSE ACTIVITIES

There are nearly limitless activity guides, tutorials, curriculum and resources available for use in your maker program. Use the results from your Maker Strengthsfinder Worksheet to select activities you feel confident including in your first maker program.

Remember to start with the lowest-hanging fruit.

TIME: 2-8 Hours
PEOPLE: 1-4
MATERIALS: Maker Program Activity Guide, computer, and internet connectivity

MAKER PROGRAM ACTIVITY GUIDE
This is a Maker Program Starter Kit Resource, available in the appendix and on Google Drive.

To help you get started, we've put together a Maker Program Activity Guide to help you quickly identify beginner-level projects that match your strengths and the needs of your program. This guide includes the following information for over eighty beginner-level maker activities:

- Title & Link
- Description
- Source/Author
- Skills Learned
- Type of content (kit, video, step-by-step guide, etc)
- Target Grades
- Estimated hours to complete
- Difficulty to facilitate
- Estimated cost of materials for 10 learners
- Advanced software & equipment required (beyond standard classroom materials like scissors, paper, markers, etc)
- Potential Tie-ins to Core Subjects

Use the Maker Activity Guide to identify the specific activities that you'd like to incorporate into your program. Of course, feel free to also use activities that aren't included in this guide or that are of your own invention!

"Even if you don't have access
to expensive…
hardware, every classroom
can become a makerspace where kids and teachers learn together through direct experience with an assortment of high and low tech materials."

~ Gary Stager and Sylvia Martinez in Invent to Learn

GO TO STEP:

Activity 6: Explore & Choose Activities

Activity Title	Brief Description	Source	Category	Content Type	Hours	Difficulty	Grades	Potential Subject Tie-Ins	Advanced Software & Equipment Required	Link
Coding with Paper: Space Race Game	The object of the Space Race game is to navigate your rocket ship safely through the galaxy of aliens and satellites, all the way to the moon. Using the pre-made coding blocks students can create a 'program' of directions for their rocket to follow and complete its mission.	Fractus Learning	Coding	Step-by-Step Guide	1	Easy	K-8	Science; Space	-	https://www.fractuslearning.com/2014/11/18/coding-with-paper-printable-game/
The Perfect Recipe	Do you have a favorite recipe that you want to share with the world? With this project we will use code to write a recipe that looks as good as it tastes.	Google Creative Lab	Coding	Step-by-Step Guide	3	Intermediate	6-12		Computers with internet	https://googlecreativelab.github.io/coder-projects/projects/perfect_recipe/
Make Your Own Mondrian	Paint makes a mess. Code is so much cleaner. Use this project to recreate a classic Modern artwork, Piet Mondrian's Composition II in Red, Blue, and Yellow in your browser using basic web building blocks.	Google Creative Lab	Coding	Step-by-Step Guide	3	Intermediate	6-12	Art	Computers with internet	https://googlecreativelab.github.io/coder-projects/projects/mondrian/
Pop-Up Penguin Game	Make a simple game to play with your friends and family. See if you can find all the penguins without waking the yeti!	Google Creative Lab	Coding	Step-by-Step Guide	3	Intermediate	6-12	Art	Computers with internet	https://googlecreativelab.github.io/coder-projects/projects/pop_up_penguins/
Interactive Space Wizard Game and Controller	Remixing a game that is designed for integration with a MaKey MaKey powered controller is a great introduction to the key concepts of building an interactive game! All you need is a Scratch account, a MaKey MaKey, and some basic construction items!	Digital Harbor Foundation	Coding & Electronics	Step-by-Step Guide	2	Intermediate	3-8	Science; Space	Computers with internet and acces to Scratch, Makey Makey	https://blueprint.digitalharbor.org/projects/interactive-space-wizard-game-and-controller/
5 Chairs Exercise	The 5 Chairs activity encourages students to design models of chairs based on design principles they pull from user profiles. This activity also encourages students to iterate on their designs and practice using different materials.	d.school	Design Thinking	Step-by-Step Guide	1	Intermediate	4-12		-	https://dschool.stanford.edu/groups/k12/wiki/17761/5_Chairs_Exercise.html
Wallet Project	The Wallet Project is a one-hour overview of the entire design process.	d.school	Design Thinking	Step-by-Step Guide	1	Intermediate	4-12		-	https://dschool.stanford.edu/groups/k12/wiki/c739e/Wallet_Project.html
Underwater Microphone Kit	Follow National Geographic Explorer, Shah Selbe, on his adventure into the wilds of the Okavango Delta in Botswana to listen for wildlife. At home, you can have your own adventure with an underwater microphone, also known as a hydrophone, by listening to the sounds in your local pond, river, ocean (or bathtub).	KitHub	Digital Media	Kit	2	Easy	K-8	Science, marine science, ecology	Hydrphone Kit	https://kithub.cc/hydrophone/
Make a Music Video	Students work together to create a short music video for a familiar children's song.	Education World	Digital Media	Step-by-Step Guide	5	Intermediate	K-8	Art; Launguage Arts; activity is standards-aligned	Camcorder and Computer with basic video editing software	http://www.educationworld.com/a_lesson/01-1/lp226_05.shtml
DIY Sound Effects	A basic overview of the art of sound effects, including how to make them, how to record them, and even how to automate them.	Instructables	Digital Media	Video Instructions	2	Easy	3-12	Art	Microphone	http://www.instructables.com/id/DIY-Sound-Effects/

GO TO STEP:

Activity 7: Outline Your Program

ACTIVITY 7: OUTLINE YOUR PROGRAM

Once you've identified compelling activities, you can use the Program Outline Template to break down a day-by-day plan for your program. This will be your go-to planning document for the duration of your program. It will also be a useful tool to share with volunteers who are helping to facilitate your program and for finalizing your budget.

TIME: 2 hours
PEOPLE: 1-4
MATERIALS: Program Outline Template and computer with internet

PROGRAM OUTLINE TEMPLATE
This is a Maker Program Starter Kit resource, available on Google Drive.

CHOOSE A PROGRAM THEME

Creating a compelling theme or story that weaves the activities in your program into a cohesive experience will help to motivate engagement. Themes you might consider include:

- Exploring and building prototypes of solutions to address a specific problem in your community or school
- A subject-based theme, such as "Ancient Egypt" or "Marine Biology"
- A multi-stage citizen science project; best done in partnership with a local nonprofit or scientist
- A theme that coincides with a community event series or school initiative; for example, adding electronics and e-textiles to your homecoming float
- Challenge-based projects or contests
- Ask your students what's important to them
- Get creative! Use whatever will get your participants most excited

Activity 7: Outline Your Program

MAKER PROGRAM STARTER KIT

Your Program's Title

Your School/Organization

Overview

Your 1-2 sentence program description

Key Information
- Ex: 45 minutes, 2/week, 10 weeks total
- Ex: Type of space
- Ex: Key Tools Required
- Ex: Consumable Materials Required
- Ex: Total Cost of Consumable Materials

Essential Question

According the the Grafton School District, "Essential questions are open-ended, interpretive questions that reflect the most important issues, problems, procedures, and debates associated with the content area. By exploring essential questions throughout their education, students are encouraged to engage in inquiry, debate, and further questioning by revisiting these essential questions throughout their school careers and beyond." If you're unfamiliar with with Essential Questions/Enduring Understandings, feel free to replace this section with your own framework to outline the learning that will occur during in this program.

Enduring Understanding

According the the Grafton School District, "Enduring understandings are statements summarizing important ideas and core processes that are central to a discipline and have lasting value beyond the classroom. They synthesize what students should understand—not just know or do—as a result of studying a particular content area. Moreover, they articulate what students should "revisit" over the course of their lifetimes in relationship to the content area." If you're unfamiliar with with Essential Questions/Enduring Understandings, feel free to replace this section with your own framework to outline the learning that will occur during in this program.

Goal/Themes

What common themes will weave the activities in your program into a cohesive experience? Is there an overarching goal your participants are trying to achieve?

This template is available as a Google Doc in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go! See the appendix for details.

GO TO STEP:

STEP 5
SKILL UP

GO TO
STEP:

STEP 5: SKILL UP

Congratulations, you've designed your maker program! Nice work. Now how will you go about facilitating these exciting new activities? This section will help you identify methods and opportunities to "skill up" before your program begins.
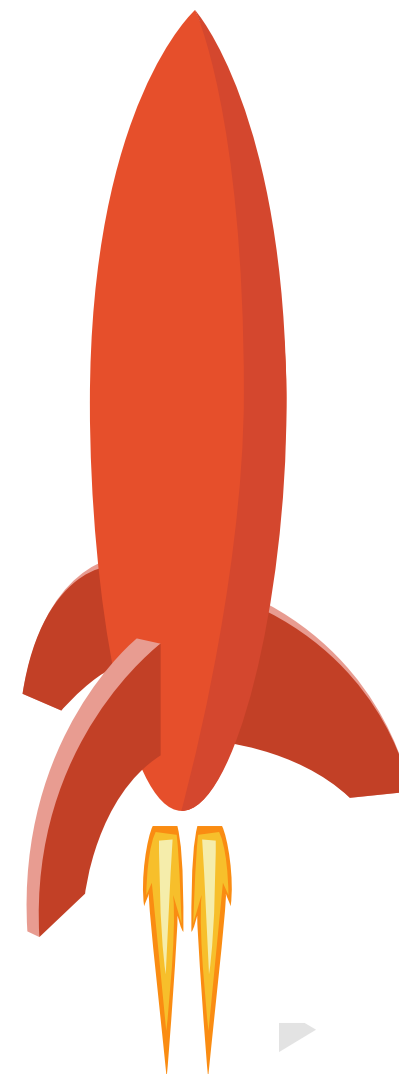
BRUSH UP ON OLD SKILLS

There's a good chance that you were reminded of a few rusty maker skills during your Maker Strengthsfinder Activity. Now's the time to revisit those experiences and brush up!

Perhaps your mom was a seamstress who taught you basic stitches but you haven't touched needle and thread in years. Maybe you participated in a 3D printing workshop but the space was crowded and you're are fuzzy on the details. Perhaps you got really into screen printing two summers ago but the tools have been collecting dust in your garage ever since. Whatever you have experience with, run with it!

Block out 2-10 hours (depending on the skill and just how rusty you are), and prepare for some catchup. Here are some tips to get started:

· Dig out old tools and equipment you haven't used in a while and complete a small project.
· Connect with skilled friends and people in your community and request a 1-hour brush-up
· Explore the communities listed in Step 9 to request specific advice or further resources

GO TO STEP:

LEARN NEW SKILLS

In the previous step you may have decided to tackle a few activities that you've never encountered before. That's awesome! There are many maker skills you can begin to learn with only a few hours of work. One great way to get started is to simply complete the activities you've chosen for your student in advance. Most of the resources in the Activity Guide include extensive instructions and documentation that will help you walk through each experience. If you have questions, utilize the forums listed in Step 9 to discover answers within the maker education community. Completing your activities in advance will help you build confidence before introducing them to students.

As you saw in the Maker Program Activity Guide, many maker activities can be completed with relatively low-tech resources. Cardboard, fabrics, duct tape, paper and pencils can take you a surprisingly long way. On the other hand, if you're incorporating technology and software you've never used before, building foundational knowledge with those tools will enable you to facilitate learning as smoothly as possible.

To help you get started, we've put together a List of Educator Learning Resources.. This list includes the following information for over forty self-directed learning resources to help you gain experience with new skills and tools before your program begins.

- Tool/Skill
- Description
- Hours to learn basics
- Difficulty to learn
- Cost of necessary equipment, software and materials
- Cost of instruction, if applicable
- URL to resource

LIST OF EDUCATOR LEARNING RESOURCES
This is a Maker Program Starter Kit Resource, available in the appendix and on Google Drive.

GO TO STEP:

Tool/Skill	Description	Hours	Difficulty to Learn	Skill Category
Tinkercad, 3D modeling	Tinkercad has a fantastic and fun seires of interactive lessons that teach all the basics of navigating and using the software. https://www.tinkercad.com/learn/	1	Easy	3D Technology
123D Design, 3D modeling	123D Desing has a seies of videos for mastering the tool's interface. http://www.123dapp.com/howto/design	2	Easy	3D Technology
123D Catch, 3D capture	Videos and documentation to help you get started, or get more advanced with 123D Catch – a free app that turns photos into 3D models. http://www.123dapp.com/howto/catch	2	Easy	3D Technology
123D Sculpt, 3D modeling	123D Sculpt+ includes in-app training.	2	Easy	3D Technology
Autodesk Fusion, 3D modeling	Fusion has a great series of videos that will help you begin modeling quickly and easily. http://www.autodesk.com/products/fusion-360/learn-training-tutorials; After completing this you can dig deeper on the Autodesk Design Academy by filtering for "Fusion 360": https://academy.autodesk.com/explore-and-learn	2	Easy	3D Technology
3D Printing Basics	Follow the instructions provided by the manufacturer of your 3D printer to print your first project.	6	Intermediate	3D Technology
3D Printing, Comprehensive Introduction	If you don't have someone to teach you in person, take the online 3D printing course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/3D-Printing-Class/	30	Intermediate	3D Technology
AutoCAD, 3D modeling	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started at https://academy.autodesk.com/software/autocad	10	Difficult	3D Technology
Maya, 3D animation	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started at https://academy.autodesk.com/software/maya	10	Difficult	3D Technology
3DS Max, 3D animation	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started at https://academy.autodesk.com/software/3dsmax	10	Difficult	3D Technology
Autodesk Inventor, 3D modeling	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started with Inventor. https://academy.autodesk.com/software/inventor	10	Difficult	3D Technology
Scratch, beginner game design & coding	Scratch includes a well-designed series of starter tutorials when you open the tool. If you need additonal support, the creators at MIT have made a very useful set of guides and videos at https://scratch.mit.edu/help/	2	Easy	Coding
HTML & CSS, web design	Online interactive tutorials like those offered by Codecademy are a great way to learn the basics of web design with HTML & CSS, as well as other programming languages. https://www.codecademy.com/learn/make-a-website	4	Intermediate	Coding
Powtoons, 2D Animation	Powtoons offers a very easy to follow series of video tutorials to get you started. https://www.powtoon.com/tutorials/	1	Easy	Digital Media
Video Production	A great resource to learn or review the basics of video production and editing is the "Filmmaking 101" section of the Vimeo Video School. https://vimeo.com/blog/category/video-school	3	Intermediate	Digital Media

GO TO STEP:

1

PROFESSIONAL DEVELOPMENT OPPORTUNITIES

If you're seeking a more generalized introduction to maker education, you may want to consider professional development. Here's a list of professional development opportunities that may be a fit for you:

ONLINE PROFESSIONAL DEVELOPMENT

MAKER ED Maker Ed offers a brand-new online PD program in maker education http://autode.sk/MakerEdPD	**HIGH TECH HIGH MOOCS** http://autode.sk/hightechhighmooc	**ISTE** ISTE, the International Society for Technology in Education, offers online courses and webinars http://autode.sk/ISTEpd
HARVARD PROJECT ZERO http://autode.sk/projectzero	**SONOMA STATE UNIVERSITY** Maker Certificate Course http://autode.sk/makercert	**COURSERA** Tinkering Fundamentals: A Constructionist Approach to STEM Learning http://autode.sk/CourseraPD
BUCK INSTITUTE http://www.bie.org/	**LRNG** Maker Educator Playlist http://autode.sk/LRNGplaylist	**EDUCATION CLOSET** Assessment for Makers Online Course http://autode.sk/EduCloset

GO TO STEP:

IN-PERSON PROFESSIONAL DEVELOPMENT

IDEO TEACHERS GUILD COACHES

https://teachersguild.org/coaches

DIGITAL HARBOR FOUNDATION

Educator Workshops
http://autode.sk/DigitalHarborBlueprint

INVENT TO LEARN

Authors of Invent to Learn
http://inventtolearn.com/workshops/

LIGHTHOUSE CREATIVITY LAB

http://autode.sk/LighthouseCreativityLab

THE EXPLORATORIUM
San Francisco, CA
Middle school and high school math and science professional development
http://autode.sk/TeacherInstitute

NUVU INNOVATION CAMP FOR EDUCATORS

http://autode.sk/NUVUinnovation

UNPROFESSIONAL DEVELOPMENT
Berkeley, CA
http://autode.sk/berkeleyCreativity101

DISCOVERY EDUCATION

http://autode.sk/DiscoverySTEM

STANFORD D.SCHOOL K12 LAB

Offers introductory workshops on design thinking.

www.k12lab.org/

GO TO STEP:

STEP 6

COORDINATE SUPPORT & LOGISTICS

GO TO STEP:

STEP 6: COORDINATE SUPPORT AND LOGISTICS

It's time to begin sharing your ideas with potential supporters and pulling together the resources that will bring your program to life.

Although you may be able to take on a lot by yourself, engaging your community will be crucial for your program's success and sustainability. Incorporating the unique resources and expertise of local businesses, community members, and organizations can also give your program a unique flare for participants.

For example, can you get a female engineer from a local tech company to present to your group? Perhaps a nearby factory would be willing to give your participants a tour? Maybe the department store down the street has cardboard boxes you can use for an activity? Could a local graphic designer run a hands-on design workshop for your participants? You'll never know until you ask!

Beyond community support, much of the logistical work that goes into starting a makerspace or maker program is well-documented in other fantastic resources. We'll introduce several considerations you'll want to keep in mind as you move forward with your program, as well as dozens of existing resources to help you do so. The logistics-focused categories we'll review include safety, people organization, funding, and space.

GO TO
STEP:

Activity 8: Share Your Vision

ACTIVITY 8: SHARE YOUR VISION

Now that you've got your ideas organized, let's put them into a format that will be easy to share with others. You can use our template or create your own custom one-page document to share your vision with the community. You could also create a website; tools like Weebly, Strikingly and Squarespace have drag-and-drop editors that make it very easy to design and build your first website.

ONE-PAGER TEMPLATE
This is a Maker Program Starter Kit resource, available on Google Drive.

TIME: 30 minutes - 4 hours
PEOPLE: 1-6
MATERIALS: Computer with internet access

Here are a few things to keep in mind as you share your vision:

• Be visual. If possible, use high-quality photos of your students engaging in making activities to capture viewer attention.
• Be concise and use simple language (no need for techie speak here!).
• Make your text easy to read by choosing simple fonts and using standard capitalization (ALL-CAPS is harder to read).
• If possible, share measurable success criteria (people love data!).

Other tools you might use to share your vision include:

• Google Sites (you can also create an affiliated Google Group)
• Facebook page
• Medium
• Weebly
• Wordpress
• Squarespace
• Strikingly
• Piktochart
• Powtoons
• Freepik for free and low-cost graphics

GO TO STEP:

Activity 8: Share Your Vision

YOUR LOGO HERE

Your Program Title

Your Organization

Your 1-2 sentence program description | Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.

YOUR IMAGE HERE

Dates & Time	**Location**	**Ages**
[date/time details]	[location details]	[eligibility details]

More Information
[Contact Person & Info]

MAKER PROGRAM STARTER KIT

This template is available as a Google Doc in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go! See the appendix for details.

GO TO STEP:

ACTIVITY 9: SURVEY YOUR COMMUNITY

As discussed earlier, engaging your community will be crucial for building a thriving program. Your next step will be to share a survey - along with your beautiful one-pager or website - with potential supporters. Be sure to provide a brief introduction to your program in the body of any email or message you send requesting support. You can create your own survey from scratch, or get started with our template.

TIME: Varies
PEOPLE: 1-3
MATERIALS: Computer with internet access

Some of the key ways your community may be able to help include:

- Volunteering (extra hands on deck during program)
- Technology Instruction
- Guest speaking
- Mentorship for projects
- Event organization
- Outreach and promotion
- Donating equipment and materials
- Photography and/or videography
- Writing an article about your program
- Grant funding and monetary donations

In addition to the immediate network at your school or organization, you may also reach out to the following to explore possibilities for collaboration and partnership:

- Local library youth department
- Boys and Girls Club
- Girl Scouts
- Boy Scouts
- YMCA youth services
- Youth Groups
- College students (education students in particular may be great volunteers!)
- Corporate partners (may be willing to donate goods/services)
- Business Leaders & Chamber of Commerce

COMMUNITY SURVEY TEMPLATE
This is a Maker Program Starter Kit resource, available on Google Drive.

People will want to help! Don't be afraid to ask for support.

Activity 9: Survey Your Community

Community Survey: Help Build Our Maker Program

Thanks for your interest in helping us foster creativity and innovation in local youth by contributing to our new maker program! We're looking for volunteers, materials, tools and more to get this off the ground. Please use this form to tell us how you might be able to contribute.

* Required

Let's start with the basics...

First Name *

Your answer

Last Name *

Your answer

Email Address *

Your answer

Other Contact Information?

Would you prefer we get in touch with you in a different way?

This template is available as a Google Doc in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go! See the appendix for details.

GO TO STEP:

SPACE

When it comes to making, space matters. Do you have access to electricity? Wifi? Will using a loud drill or vacuum disturb people in the next room? Will direct sunlight damage your projects? There are many things to consider, and most depend on what you're doing. For the most part, you'll simply have to use your best judgement, but there also are many fantastic resources to help you avoid common mistakes as you get started.

MAKER ED RESOURCE LIBRARY Spaces & Places http://autode.sk/MakerSpaces	**PLACES** YouMakerspace Playbook, pages 5-8 http://autode.sk/ MakerspacePlaybook	**PLACES TO MAKE** Youth Makerspace Playbook, pages 10-26 http://autode.sk/ MakerspacePlaybook
SHAPING THE LEARNING ENVIRONMENT Chapter 9, Invent to Learn	**THE PHILOSOPHY OF EDUCATIONAL MAKERSPACES** Part 1 of Making an Educational Maker Space http://autode.sk/EdMakerspace	**INFORMAL LEARNING ENVIRONMENTS FOR LIBRARIES** YALSA Making Playbook, page 7 http://autode.sk/YALSAmaking

SAFETY

Safety and liability are important considerations for your program. Your number one concern should always be providing a safe environment for your participants. Be aware of the hazards involved with using tools and equipment and take appropriate precautions. Please be sure all of Makerspace users (of all ages) are properly trained in safely operating tools and machinery before using them. It's also a good idea to clearly post safety rules and requirements in your makerspace. Here are some starter resources to help make sure you and your students are safe during your program.

SAFETY CONSIDERATIONS	**SAMPLE LIABILITY WAIVER**	**TIPS FOR TAKING APART ELECTRONICS**
Makerspace Playbook, pages 13-16	Makerspace Playbook, page 66	Youth Makerspace Playbook, pages 68-69
http://autode.sk/MakerspacePlaybook	http://autode.sk/MakerspacePlaybook	http://autode.sk/YouthMakerPlaybook

GO TO
STEP:

ORGANIZING PEOPLE

As discussed earlier, finding the right people to help support and facilitate your program will be a crucial step toward success. You'll need people who can help with the following:

· Instruction and coaching
· Logistics and scheduling
· Equipment maintenance and materials purchasing
· Budgeting and fundraising
· Marketing and recruitment
· Coaching and encouragement

Here are some fantastic resources to help you build and maintain a great team:

PEOPLE & PARTNERS	**TIPS FOR MENTORS**	**MAKER ROLES**
Makerspace Playbook, pages 52-57 http://autode.sk/ MakerspacePlaybook	Maker Club Playbook, pages 20-22; 52 http://autode.sk/ MakerClubPlaybook	Makerspace Playbook, pages 17-20 http://autode.sk/ MakerspacePlaybook
SAMPLE JOB DESCRIPTIONS FOR VOLUNTEERS AND MEMBERS Maker Club Playbook, pages 54-55 http://autode.sk/ MakerClubPlaybook	**GETTING BUY-IN** YALSA Making Toolkit, page 8 http://autode.sk/YALSAmaking	**SAMPLE EMAILS** Maker Club Playbook, pages 68-77 http://autode.sk/ MakerClubPlaybook

FUNDING AND BUDGET

There are many approaches to making, and many of them are relatively inexpensive to pursue. At some point, however, you'll likely want to find additional financial support. Grants, local companies, crowdfunding platforms and fundraising drives can all be great ways to get started. The below resources can help you create a realistic budget, reduce costs and find financial support to get your program off the ground.

GETTING BUY-IN FOR YOUR MAKERSPACE http://autode.sk/getbuyin	**LIST OF TOOLS & MATERIALS** Cost breakdown http://autode.sk/MakerTools	**CHECKLIST FOR GRANT PLANNING AND DEVELOPMENT** Makerspace Playbook, pages 43-44 http://autode.sk/MakerspacePlaybook
LIST OF GRANTS FOR MAKERSPACE SCHOOLS http://makergrants.blogspot.com/	**SAMPLE BUDGET** Maker Club Playbook, page 53 http://autode.sk/MakerClubPlaybook	**DONORS CHOOSE** Crowdfunding for your program https://www.donorschoose.org/
SIX STRATEGIES FOR FUNDING A MAKERSPACE http://autode.sk/FundMakerspace	**FUNDING YOUR MAKERSPACE** http://autode.sk/FundMakerspace2	**LIST OF AFTER-SCHOOL PROGRAM FUNDERS** By Sphero http://autode.sk/SpheroFunders

GO TO STEP:

STEP 7

MARKET YOUR PROGRAM

STEP 7: MARKET YOUR PROGRAM

RECRUITMENT

Unless you're a teacher with a classroom of students, you'll probably need to do some legwork to recruit participants to your program. Planning the nuts and bolts of your program can be so exciting that recruitment is often overlooked. Creating a plan to get participants in the door and keep them coming back is as important as choosing the right equipment and volunteers.

Here are a few common ways maker educators recruit program participants:

- Create a survey to collect contact information for interested participants.
- Attend a local Maker Faire where you might:
    - Set up a booth to advertise your maker program
    - Distribute flyers or balloons to participants
- Use Twitter, Facebook, Instagram and other social media platforms to share your program with local educators and youth organizers.
- Speak at conferences, networking events, and schools
- Set up an information table at a local school; this can be particularly effective during the lunch hour.
- Use "guerilla marketing" tactics like chalk stencils to share information about your program in locations frequented by youth and parents.
- Create posters, postcards, flyers, sticker and distribute them to teachers, parents, and community partners.
- Engage your school, organization, volunteer and team to help distribute promotional materials and recruit.

GO TO STEP:

COMMON METHODS TO
MOTIVATE PARTICIPATION

Intrinsic Motivation
A best-case scenario for a maker program is to be working with students who are intrinsically motivated to take part. Some of your students will have a deep-seated interest in one or more technologies that will keep them coming back class after class. Other students will require more prompting. For learners without a natural interest in technology, problem-based learning can be a fantastic tool to foster intrinsic interest in your program. Even for students as young as 5 years old, the opportunity to use a new tool or technology to address a real-world problem can be a powerful and life-changing experience.

Social Motivation
For middle school and high school students in particular, social motivation is a powerful tool. Teamwork that requires the full participation of all members of the group can help engage the full class. This approach is most effective in programs that are at least partially student-lead.

School Credit
Academically-driven students will be more likely to participate fully if they are able to receive school credit for your program.

Competitions/Contests
Competition for small prizes can be a fun way to lighten the mood and encourage engagement, particularly for group work. Applied learning opportunities that enable students to develop and pitch solutions to real companies is a great way to not only motivate engagement from students, but to also involve the broader community in your program.

"HOW A BIGGER PURPOSE CAN MOTIVATE STUDENTS TO LEARN"
By KQED's Mindshift team
http://bit.ly/PurposeLearning

GO TO STEP:

Students Pay
Participants who are required to pay for a program are more likely to attend. Although free programs can reduce barriers to entry, they often result in overblown registration numbers that make them difficult to plan.

Application-Only
A selective application process can increase the perceived value of a program for participants and increase attendance and participation.

Stipends
Some programs - particularly those targeting low-income and at-risk populations - have found success with providing stipends to students who successfully complete programs. This means participants are paid a predefined amount of money when they complete the program. This approach enables learners who may otherwise need to work to make time for your program (and valuable skill building!).

GO TO STEP:
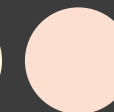
Activity 10: Create a Marketing Plan

ACTIVITY 10: CREATE A MARKETING PLAN

One thing you can do to improve your chances of recruiting participants to your program is to create a marketing plan that outlines your outreach efforts. You can get your plan started by using the Marketing Plan Worksheet in the Maker Program Starter Kit.

TIME: 2-4 hours
PEOPLE: 1
MATERIALS: Marketing Plan Worksheet and computer with internet

SUPERINTENDENT'S GUIDE TO SOCIAL MEDIA
Check out this social media guide at http://bit.ly/makermarketing

MARKETING PLAN WORKSHEET
This is a Maker Program Starter Kit Resource, available in the appendix and on Google Drive.

GO TO STEP:

Activity 10: Create a Marketing Plan

MAKER PROGRAM STARTER KIT

Marketing Plan Worksheet

Unless you're a classroom teacher with the ability to run your maker program during the school day, you'll likely need to actively recruit students to join your program. This worksheet will help you organize a plan to help do so. Use the blank to add your own ideas:

Who are you targeting with your marketing campaign?

☐ Potential Participants   ☐ Parents   ☐ Teachers   ☐ Youth Organizations

☐ _____   ☐ _____   ☐ _____   ☐ _____

What tools and platforms do you expect to use during your campaign?

☐ Email   ☐ Phone Calls   ☐ Local events
☐ Mail   ☐ Facebook   ☐ Newspapers
☐ Radio   ☐ Twitter   ☐ School Presentation
☐ Flyers   ☐ Instagram   ☐ Presentations to community groups
☐ _____   ☐ _____   ☐ _____
☐ _____   ☐ _____   ☐ _____

How much money (if any) do you have budgeted for marketing?

_____   NOTE: If you decide to pursue paid marketing on Facebook or another platform, do your research first to ensure that your ads are reaching only your targeted audience.

If you have a budget, where do you expect to spend it?

☐ Online paid advertising   ☐ Graphic Design   ☐ Printing
☐ Offline paid advertising   ☐ Video Production   ☐ Photography
☐ _____   ☐ _____   ☐ _____
☐ _____   ☐ _____   ☐ _____

PG 1 of 3

Add your own ideas in the blanks!

GO TO STEP:

STEP 8

PREP FOR INCLUSIVITY

STEP 8: PREP FOR INCLUSIVITY

Making is a fun and rewarding endeavor that should be available to all, regardless of gender, age or physical or cognitive difference. One of the powerful things about the creative nature of making is that it's extremely well-suited for adaptation to meet the needs of a wide variety of participants. Step 8 will take you through ways to weave inclusivity and adaptability into your program.

WORKING WITH YOUTH WITH DISABILITIES

People who live with disabilities spend a great deal of time inventing solutions to overcome the unique barriers in their lives. This can range from wheelchair adaptations to navigate a space more effectively to original approaches to work and learning.

In many ways, people with disabilities are natural makers.

As a maker educator, you can approach disabilities as an opportunity for creativity. With the right mindset, you can adapt any activity for nearly any learner. Here are a few tips to help do so:

- If possible, involve the learner in the adaptation process. It's okay to describe the activity and ask the learner for suggestions. Some students with disabilities will be eager to participate in the adaptation process; others may require a great deal of encouragement to even try the activity. In the latter case, you'll need to be more proactive in preparing a potential solution the learner can get excited about ahead of time.
- Explore tools or technologies you might use to adapt the activity for the learner. This is a maker program, after all!
- If it makes sense, find ways to use pair and group work to enable peers to support learners with disabilities.

ENCOURAGING NEURODIVERSITY IN YOUR MAKERSPACE
http://autode.sk/neurodiversity

MAKERSPACES FOR STUDENTS WITH SPECIAL NEEDS
http://autode.sk/MakerSpecialNeeds

GO TO STEP:

PROGRAM SPOTLIGHT: SUPERHERO CYBORGS

Superhero Cyborgs worked with kids with upper limb differences to design and prototype their own body modifications. Participants learned to use technology ranging from 3D printing, modeling, and scanning to plaster casting, fabrics, and electronics, before creating their own super powered device! This workshop seeks to reframe disability as an opportunity, asking the question: if not a hand, then what? Participants drove their designs, with the support of professional designers and engineers who asked great questions to guide them through the process. It's a challenge that kids care about, and helps them to understand the process and build confidence in coming up with ideas and them bringing those ideas to reality.

SUPERHERO STORIES:

KIERAN
SUPERHERO CYBORGS

JORDAN
SUPERHERO CYBORGS

Sydney
SUPERHERO CYBORGS

❝ Kieran can not stop talking about the wonder of so much he experienced with all of you, as he labeled you on the way home his " personal tech family" There is no words or amount of money, I could have paid for all you gave to him and making him feel such strong confidence as he states now, he also claims is very knowledgeable now in the tech world because of all you willing to share and teach him. ❞

-Kieran's Grandmother

❝ Jordan literally told me Superhero Cyborgs has changed her life and how she thinks about things. It's an awesome awakening. I told Kate [an organizer] before the event that Jordan was a direction follower, she didn't build stuff beyond what was offered in the directions. She's thinking outside of the box now. And I'm super proud. ❞

-Jordan's Mother

❝ You don't even know what an impact this has had on Sydney she feels so big right now! I don't know if that is the right word. She has so much confidence in herself now. She feels smart and that she can really make a difference. She gave her siblings, dad and neighbor a presentation about what she learned. It was great to see! Thank you to all of you for the opportunity she is truly a changed girl! Thank you thank you thank you. ❞

-Sydney's Mother

GO TO STEP:

"We need to ask students which are the problems they want to solve and we, educators, have to make sure we create the spaces for them do it."

– Rafranz Davis, Executive Director of Professional and Digital Learning for Lufkin ISD

GO TO STEP:

DIVERSITY

Another crucial consideration for your program is how to foster a culture of inclusivity for all genders and ethnicities. Since the 1950s, maker toys like robotics kits and remote-control cars have been traditionally marketed toward boys. Be intentional about providing counter-examples to help your students understand that anyone can be a maker, scientist, engineer or technologist.

Here are a few ways you can support diversity and inclusivity in your program:

- Choose gender-neutral activities. Particularly for younger learners, selecting activities that don't easily fall into "for boys" or "for girls" categories will encourage full engagement from participants of both genders.
- Include women and people of color as mentors or speakers in your program whenever possible.
- Be intentional in your choice of activities.
- Share stories of diverse makers from a variety of backgrounds. People you might feature include:
    - Mae Jemision, the first African-American woman in space
    - Marissa Mayer, President & CEO of Yahoo
    - Ime Archibong, Manager of Strategic Partnerships at Facebook
    - Reshma Saujani, Founder of Girls Who Code
    - Luis Von Ahn, CEO & Co-Founder of Duolingo
    - Megan Smith, Chief Technology Officer of the United States
    - Timothy Campos, Chief Information Officer at Facebook
    - Carolina Huaranca, Entrepreneur in Residence @KaporCSI
    - Malik Ducard, Director of Content Partnerships at Youtube
    - Ann Wojcicki, Co-Founder & CEO of 23andMe
    - Lixia Zhang, Profession of Computer Science at UCLA
    - Erica Joy Baker, Senior Engineer at Slack
    - Cynthia Breazeal, Co-Director of the Center for Future Storytelling at MIT

DIVERSITY DOES NOT HAPPEN BY ACCIDENT
http://autode.sk/NotByAccident

BRIDGING THE GAP BETWEEN GIRLS AND STEM
http://autode.sk/GirlsAndSTEM

MAKING INCLUSIVITY
Meaningful Making, page 50
http://autode.sk/MakingInclusivity

COMPUTER SCIENCE WOMEN'S NETWORK
https://www.cs.purdue.edu/cswn/

GO TO STEP:

STEP 9
DIVE IN

STEP 9: DIVE IN

DOCUMENTING YOUR PROGRESS

A key thing to keep in the back of your mind as you run your program is documentation. This will enable you to reflect on what worked (or didn't work) during your program launch and make improvements in the future. Here are a few tips to help:

Keep a Journal

It's surprising how much you can forget throughout the course of a program. Whether you take audio notes on your smartphone or scribble on loose-leaf paper, taking daily notes will be a tremendous asset as you plan for your next program.

For example:
- "Brainstorming activity ran over. Need 30 minutes, not 20."
- "Student really enjoyed the TED talk. Def use this again!"

Track Your Indicators of Success

If you used the Indicators of Success worksheet, make sure you don't forget to follow through on the methods you designed

Take Photos and Videos of Everything

Yes, you definitely want to capture smiling faces and participants at work, but also remember to document the things they make during your program. If you have time, take a minute or two after each class to capture pictures of participant brainstorming notes, worksheets, projects and prototypes. These will also help inform the development of your next program. Creating short videos that overview your projects and program can also be helpful for future recruitment. If you're too busy to make this happen or are unfamiliar with video editing, consider having a few of your students take this on.

DOCUMENTATON
Explore more ways to document projects in the Makerspace Playbook, pages 45-46
http://autode.sk/
MakerspacePlaybook

GO TO
STEP:

WHAT TO DO WHEN YOU GET STUCK

At one point or another, you will get stuck. Good thing there's a community for that! Many of them, in fact...

Online Communities, Groups & Forums

- Maker Ed Google Group:
  https://plus.google.com/u/0/communities/108516741770696736815
- The IDEO Teachers Guild:
  https://collaborate.teachersguild.org/
- K-12 Fab Labs and Makerspaces Google Group:
  https://sites.google.com/site/k12makers/
- Maker Movement EDU Google Group:
  https://plus.google.com/collection/oE_wZ
- Fabfoundation.org
- International Society for Technology in Education:
  iste.org
- Fablearn.Stanford.edu/conferences

Skill-Specific Forums:

- General forum for Autodesk products: forums.autodesk.com/
  Instructables forums: http://www.instructables.com/community/
- Autodesk Fusion 360 Forum:
  https://forums.autodesk.com/t5/fusion-360/ct-p/1234
- Community for Autodesk Media and Entertainment Products:
  area.autodesk.com/
- Sparkfun forum for electronics projects: https://forum.sparkfun.com/
- Wiki for the Stanford Design School (d.school) K-12 Lab Community:
  https://dschool.stanford.edu/groups/k12/search/?tag=educator+workshop
- Scratch Community: scratched.gse.harvard.edu/discussions
- Adobe Community: https://edex.adobe.com/search/global/?category=teach

GO TO STEP:

Local Groups & Meetups:

- Search for "maker education" on Meetup.com to find related groups near you
- Reach out to a local Maker Corps site:
  http://makered.org/makercorps/about-maker-corps/program-partners/
- Search the Design Thinking in Schools Map for local programs and resources:
  www.designthinkinginschools.org/
- Search The Maker Map for nearby makerspaces and related resources:
  http://themakermap.com/
- See if there's a Fablearn K-12 Labs near you: http://fablearn.org/conferences/
- Digital Harbor Maker Ed Meetups, Baltimore, MD:
  http://www.meetup.com/DigitalHarbor
- Bay Area Maker Educators Google Group:
  https://plus.google.com/communities/112974120022463718222
- Bay Area Youth and DIY Education Facebook Group:
  https://www.facebook.com/groups/286189014822596/
- Vancouver Maker Education Meetup:
  http://www.meetup.com/Vancouver-Maker-Education-Community/
- Remake Learning in Pittsburg: remakelearning.org/meetups/
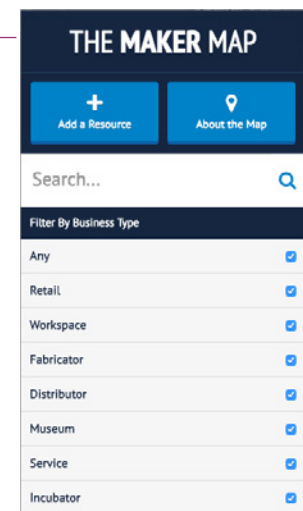
Of course, you don't have to wait until you get stuck to take part. Introduce yourself on forums and, if possible, meet a few other educators in person. Especially if you're building your maker program alone, you'll benefit from the added support.

Conferences

- Remake Education, Sonoma CA: www.remakeeducation.org/
- Maker Faire, locations around the world: makerfaire.com/
- SXSWedu, Austin, TX: sxswedu.com
- Maker Ed's Maker Educator Convening, Oakland, CA: http://makered.org/pd-events
- FabLearn: Palo Alto, CA: http://fablearn.org/conferences/

INFOGRAPHIC OF TOP
EDTECH CONFERENCES
by Edsurge
http://autode.sk/
EdtechConferences

GO TO
STEP:

STEP 10

REFLECT & REVISE

GO TO
STEP:

STEP 10: REFLECT AND REVISE

Reflection is as important for you as it is for your students! After your program comes to an end (and you've taken a nice, recuperative break), remember to return to your notes, Indicators of Success Worksheet, and any surveys that were completed throughout the program to identify your successes and opportunities for improvement. Even if you don't plan to run another maker program for a while, take time to reflect within a few weeks of your program's conclusion.

Activity 11: I like, I wish, What if

ACTIVITY 11: I LIKE, I WISH, WHAT IF

One particularly generative activity that can be conducted with your team (or with students in small groups) at the conclusion of your program is "I Like, I Wish, What If." This format of debriefing guides groups in a review of the successes and challenges of your program ———— **"I LIKE, I WISH, WHAT IF"** and opportunities for future changes. Follow the instructions from Stanford d.school partner **INSTRUCTIONS** ILikeIWish.org to complete this activity. http://ilikeiwish.org/

TIME: 1-3 hours
PEOPLE: 2-10, core team
MATERIALS: paper and pencils

NEXT STEPS

GO TO STEP:

NEXT STEPS AND CONCLUSION

Congratulations! By the time you've made it through all the steps in the guide you will have run your first maker program. It may have been small and you probably made mistakes, but that's what this is all about. You've made a huge step forward in creating momentum and excitment in your community and that is an exciting accomplishment.

Getting to this point is the reason our recommendations throughout this toolkit have been focused on starting small and getting your program off the ground quickly.

Now that your first program is complete, the next steps are up to you. Hopefully your confidence has grown and you're ready to take on something that can impact even more learners next time.

Good luck, Maker Educator!

APPENDIX
TEMPLATES

APPENDIX: TEMPLATES

Throughout this guide, we've included a series of worksheets and templates designed to make this process easier to squeeze into your busy life. These are available on Google Drive and here in this appendix:

• Maker Strengthsfinder Worksheet (pdf)
• Document Your Vision Worksheet (pdf)
• Template: Program One-Pager (Google Doc template)
• Survey Template: Community Survey (Google Form template)
• Survey Template: Participant Post-Program Survey (Google Form template)
• Survey Template: Participant Benchmarks (Google Form template)
• Survey Template: Educator Benchmarks (Google Form template)
• Survey Template: Educator Observations (Google Form template)
• Indicators of Success Worksheet (pdf)
• Maker Activity Guide (Google Spreadsheet)
• Learner Journey Worksheet (pdf)
• Template: Program Outline (Google Doc template)
• List of Self-Directed Learning Resources for Educators (pdf)
• Marketing Plan Worksheet (pdf)

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Access the Google Driver folder for the Maker Program Starter Kit at:
http://autode.sk/MakerProgramStarterKit

HOW TO DOWNLOAD AND USE OUR TEMPLATES

Option 1: Copy Files Individually

All of the files are publicly available and can be copied to your personal Google Drive Folder. Once copied, you'll have full editing privileges to change our templates to meet your needs.

To copy a document:
1. Open the document you wish to copy
2. Go to "File > Make a Copy"
3. A new copy of the document will open within your Google Drive account. You can now edit, rename and move the document as you wish. This works for all types of Google documents (docs, forms, spreadsheets, etc).

Option 2: Copy Entire Folder in Google Drive

Unlike individual files, Google Drive does not natively allow users to copy entire folders. If you use Google Chrome, however, you can use a highly-rated add-on called Copy Folder to do so. You can download this tool from the Chrome Web Store at http://autode.sk/CopyFolder

Option 3: Download Zip File to Edit in Microsoft Word

If you'd prefer to edit our templates in Microsoft Word and Excel, you can do so, but conversion often results in formatting errors. Additionally, Google Forms aren't compatible with MS Word, so this will only work for templates that are documents and spreadsheets.

All that said, if you'd still like to use Microsoft, here's how:
1. Click here to download a .zip file of all our templates.
2. Navigate to your downloads folder and locate the .zip file you just downloaded. Double click on it.
3. A folder will now open with versions of the templates that can be opened in Microsoft Word and Excel.

GO TO
STEP:

COMMON TERMS IN MAKER EDUCATION

STEAM

STEAM stands for "science, technology, engineering, art and mathematics." This term is commonly used to refer to the set of skills and proficiencies in greatest demand in the modern economy. STEAM and STEM are often used interchangeably. STEAM has gained popularity in recent years because of its more direct incorporation of creativity and design - skills that are increasingly recognized as core to 21st century success.

STEM

STEM stands for "science, technology, engineering and mathematics." The acronym can be traced to the National Science Foundation in the 1990's.

STEAD

STEAD stands for "science, technology, engineering, art and design." This acronym is less common than STEM and STEAM.

DIY

"Do it yourself." The concept of "DIY" is central to the maker movement.

K-12 or K12

The term "K-12" represents the age group of students between kindergarten and 12th grade in the US school system.

PBL

PBL most commonly stands for "project based learning." According to the Buck Institute for Education, "Project-based learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem, or challenge."

PBL sometimes stands for "problem-based learning," which is sometimes seen as a subset of project-based learning. According to John Larmer at the Buck Institute, both terms are really just "two sides of the same coin."

Design-Based Learning

"Design based learning (DBL) is one type of project-based learning which involves students engaged in the process of developing, building, and evaluating a product they have designed."

Definition by Silk, et al in the Journal of Science Education and Technology, 2009

Active Learning

"Active learning is a process whereby students engage in activities, such as reading, writing, discussion, or problem solving that promote analysis, synthesis, and evaluation of class content. Cooperative learning, problem-based learning, and the use of case methods and simulations are some approaches that promote active learning."

Definition by the University of Michigan Center of Research on Learning and Teacher

Applied Learning

"Applied learning refers to an educational approach whereby students learn by engaging in direct application of skills, theories and models. Students apply knowledge and skills gained from traditional classroom learning to hands-on and/or real-world settings, creative projects or independent or directed research, and in turn apply what is gained from the applied experience to academic learning."

Definition by the SUNY Applied Learning Steering Committee

Examples of Applied Learning experiences include internships, service learning, research, real-world projects, and study abroad programs.

Strengthsfinder Worksheet

Use this worksheet to identify your program's potential strengths. We'll go through nine categories of technology and resources you might integrate into your program and find the best place for you to begin. **For each category, check the assets you have access to.** *Check all that apply, even if they seem repetitive.* **Next, add any relevant skills or resources that** *aren't* **listed in the best-fitting category. Finish by using the below formula to calculate a "score" for each category.** Anything over 0% is a win!

Facilitator Skills *Expertise and/or professional development necessary to teach this skill*		Basic Resources *Essential resources to get started*		Intermediate Resources *Helpful resources to continue advancing (starting to get fancy)*		Expert Resources *Advanced resources to dig deeper (expensive and/or highly technical)*		Score
❏		❏		❏		❏		**TOTAL** ⬇
Number of facilitator checks:		Number of basic checks:		Number of intermediate checks:		Number of expert checks:		
x5	*Multiply the above number by 5:*	**x3**	*Multiply the above number by 3:*	**x2**	*Multiply the above number by 2:*	**x1**	*Rewrite the above number:*	*Add the four products to the left:*
						Divide the total by [a given number for each section] and multiply by 100% to get your score:		

After completing each section, transfer your scores here to compare your strengths:

%							
Space for Teaching & Storage	3D Design & Printing	Textile	Electronics	Coding	General Fabrication	Digital Media	Graphic Design

GO TO STEP:

Space for Teaching & Storage

Facilitator Skills	Basic Resources		Intermediate Resources		Expert Resources		Score
n/a	❏ A flexible space, separate from other activities ❏ Portable Maker Box or Cart ❏ Access to power outlets (do not overload) ❏ Access to a sink (nearby restroom is okay) ❏ Access to recycling and scrap bins ❏ Tables & chairs ❏ Whiteboard or chalkboard ❏ Good lighting, preferably with natural light ❏ If the space has windows, ability to adjust brightness in the room with blinds/shades ❏ Projector and speakers ❏ Printer/Copier access (FedEx okay) ❏ Internet access ❏ Basic cleaning supplies Storage: ❏ Dedicated storage space or closet, > 3ft x 3ft ❏ Plastic containers & labels ❏ Handtruck or cart for moving materials		❏ A dedicated space or classroom (at least 10ft x 10ft) ❏ Computer access ❏ Computer access for every participant ❏ High-speed internet access ❏ Separate hangout space for group work and breakout sessions ❏ Mobile Makerspace (bus or trailer, etc) ❏ Heavy-duty work table(s) Storage: ❏ Trailer ❏ Pegboard Tool Wall		❏ A multi-room youth center or makerspace ❏ Ventilation for advanced tools like laser cutters, 3D printers, and shop tools, etc ❏ Shop-Vac Storage: ❏ Dedicated storage room with shelving		
■ ■	Number of basic checks:		Number of intermediate checks:		Number of expert checks:		**TOTAL** ⬇
■ ■		*Multiply the above number by 3:* **x3**		*Multiply the above number by 2:* **x2**		*Rewrite the above number:* **x1**	*Add the four products to the left:*
	Divide the total by **70** and multiply by 100% to get your score:						

GO TO STEP:

3D Design & Printing | Including additive manufacturing and computer-aided design (CAD)

Facilitator Skills	Basic Resources	Intermediate Resources	Expert Resources	Score
Basic: ❏ Tinkercad ❏ 3D printing ❏ Autodesk Fusion basics ❏ Autodesk Inventor basics ❏ AutoCAD basics ❏ Revit basics **Advanced:** ❏ Autodesk Fusion ❏ Autodesk Inventor expert ❏ AutoCAD expert ❏ Revit expert ❏ Meshmixer ❏ Laser cutter	❏ A computer with high-speed internet and Chrome, Safari or Firefox browser installed for every two participants (students will work in pairs) ❏ A computer with high-speed internet and Chrome, Safari or Firefox browser installed for *every* participant	❏ Computer with Autodesk Fusion installed ❏ Computer with Inventor installed ❏ Computer with AutoCAD installed ❏ Computer(s) with Revit installed ❏ 3D printer	❏ Ability to tour a business or facility with professional 3D printers ❏ Laser cutter ❏ Professional 3D printer(s)	

Number of facilitator checks:		Number of basic checks:		Number of intermediate checks:		Number of expert checks:		**TOTAL** ↓
x5	Multiply the above number by 5:	**x3**	Multiply the above number by 3:	**x2**	Multiply the above number by 2:	**x1**	Rewrite the above number:	Add the four products to the left:
							Divide the total by 79 and multiply by 100% to get your score:	

Certain Autodesk products may only be used by individuals age 13 and older. You are responsible for complying with all software license agreement, terms of service and other terms that accompany any Autodesk software or services you may use in connection with your makerspace program and ensuring your participants also comply with such terms when participating in your program.

GO TO STEP:

Textiles | Including sewing, leatherworking, and e-textiles

Facilitator Skills	Basic Resources	Intermediate Resources	Expert Resources	Score
Experience with: ❏ Handstitching ❏ Types of stitches ❏ Sewing machine safety & basic use ❏ Knitting ❏ Crocheting ❏ Weaving ❏ Tying knots ❏ Fabric knowledge (terminology, care, fibers, grain, identification, etc) ❏ Using patterns ❏ Soldering & electronics ❏ Paper making ❏ Dying fabric ❏ Lilypad ❏ Blink Blink wearable tech ❏ Screenprinting ❏ Cricut cutting machine	❏ Sewing needles & thread ❏ Scissors or shears ❏ Pin cushion ❏ Thimble ❏ Seam ripper ❏ Seam gauge ❏ Measuring tape ❏ Silk pins ❏ Point turner ❏ Box to store and organize materials ❏ Safety pins ❏ Knitting needles ❏ Crochet hook	❏ Iron with steam function ❏ Sewing machine ❏ Sewing machine cover ❏ Rotary cutter ❏ Self-healing cutting mat ❏ Thread organizer ❏ Sewing gauge ❏ Ironing board ❏ Plastic tubs (for dyeing) ❏ Table loom ❏ Lilypad starter kit ❏ Blink Blink kit ❏ Conductive thread ❏ Screen printing kit ❏ Cricut Cutter	❏ Serger ❏ Cutting board/table ❏ Mannequin ❏ Loom ❏ Spinning wheel	**TOTAL** ↓

Number of facilitator checks:		Number of basic checks:		Number of intermediate checks:		Number of expert checks:		
x5	*Multiply the above number by 5:*	**x3**	*Multiply the above number by 3:*	**x2**	*Multiply the above number by 2:*	**x1**	*Rewrite the above number:*	*Add the four products to the left:*

Divide the total by **147** and multiply by 100% to get your score:

GO TO STEP:

Electronics | Including circuits, sensors, robotics, Arduino, Raspberry Pi, Makey Makey and more

Facilitator Skills		Basic Resources	Intermediate Resources	Expert R.	Score
Basic: ❏ Circuits.io ❏ Makey Makey ❏ Circuit Scribe ❏ Little Bits ❏ Sphero SPRK ❏ Makeblock ❏ Arduino basics ❏ Raspberry Pi basics ❏ Beagleboard basics ❏ Intel microcontroller basics	**Advanced:** ❏ Soldering ❏ Arduino expert ❏ Raspberry Pi expert ❏ Beagleboard expert ❏ Intel microcontroller expert ❏ Motors, gears, drivers, pulleys, sprockets, or servos ❏ Solenoids ❏ Bluetooth, wifi shields, RFID or GSM ❏ Cricuit Playground ❏ LilyPad ❏ Sensors & IOT ❏ uArm	❏ Circuits.io ❏ Makey Makey ❏ Circuit Scribe ❏ Arduino starter kit ❏ Raspberry Pi starter kit ❏ Beagleboard starter kit ❏ Intel hardware starter kit	❏ LEGO Mindstorm kit ❏ Redbot kit ❏ Sphero SPRK ❏ Little Bits kit ❏ Makeblock Robot Kit ❏ uArm **Electronics Kit Tools:** ❏ Soldering iron & tips ❏ Crimper tool ❏ Wire cutter ❏ Wire stripper ❏ Diagonal cutter ❏ Digital multimeter ❏ Breadboards ❏ Third hand ❏ Tweezers ❏ Heat gun ❏ Sensors and microelectronics, various		**TOTAL** ⬇
Number of facilitator checks:		Number of basic checks:	Number of intermediate checks:		
	Multiply the above number by 5: **x5**	*Multiply the above number by 3:* **x3**	*Multiply the above number by 2:* **x2**	**x1**	*Add the four products to the left:*
			Divide the total by **165** and multiply by 100% to get your score:		

GO TO STEP:

Coding | Including programming for software, web, apps, microcontrollers and videogames

Facilitator Skills		Basic Resources	Intermediate Resources	Expert Resources	Score
Basic: ❑ Arduino ❑ Scratch ❑ Basic experience with any programming language ❑ Hopscotch ❑ Beetle Blocks ❑ Blockly ❑ Alice ❑ HTML & CSS	**Advanced:** ❑ Python ❑ Javascript ❑ PHP ❑ Processing ❑ Swift ❑ Ruby ❑ Java ❑ C ❑ C++ ❑ C# ❑ Objective-C	❑ A computer for every two participants (students will work in pairs) ❑ A computer for *every* participant	❑ Professional programmers to serve as mentors to learners as they progress ❑ High-speed internet connectivity		

Number of facilitator checks:		Number of basic checks:		Number of intermediate checks:		Number of expert checks:		**TOTAL** ⬇
	x5	*Multiply the above number by 5:*	**x3**	*Multiply the above number by 3:*	**x2**	*Multiply the above number by 2:*	**x1**	*Rewrite the above number:*
								Add the four products to the left:

Divide the total by **105** and multiply by **100%** to get your score:

GO TO STEP:

General Fabrication | Including subtractive manufacturing, metalwork, woodwork, and lo-fi prototyping

Facilitator Skills	Basic Resources	Intermediate Resources	Expert Resources	Score
Basic experience with: ❏ Cricut cutting machine ❏ Woodburning ❏ Woodcarving **Advanced experience:** ❏ Laser cutter ❏ Woodworking ❏ Metalworking ❏ CNC safety and use	❏ Rulers ❏ Scissors ❏ Hot Glue Gun ❏ Pens & Pencils ❏ Adhesives and Joiners: tape, glue, staplers, rubber bands, binder clips, velcro, magnets ❏ Sticks & straws ❏ Wire & pipe cleaners ❏ String & rope ❏ Paper & cardboard ❏ Foil & plastics ❏ Foam, felt, fabrics ❏ Material scraps, broken electronics, etc	❏ Cricut Cutter ❏ Woodcarving chisels ❏ Woodburning pen	❏ Laser Cutter (with proper ventilation) ❏ CNC machine (with proper ventilation) ❏ Ability to tour a manufacturing business or facility with professional equipment ❏ Woodshop ❏ Metalshop	
Number of facilitator checks:	Number of basic checks:	Number of intermediate checks:	Number of expert checks:	**TOTAL** ⬇
x5 *Multiply the above number by 5:*	**x3** *Multiply the above number by 3:*	**x2** *Multiply the above number by 2:*	**x1** *Rewrite the above number:*	*Add the four products to the left:*
		Divide the total by **74** and multiply by 100% to get your score:		

GO TO STEP:

Digital Media | Including video and audio production, photography and animation

Facilitator Skills		Basic Resources	Intermediate Resources	Expert Resources	Score
Basic: ❏ Maya basics ❏ 3DS Max basics ❏ Mudbox basics ❏ Video editing basics ❏ Flame basics ❏ Unity3D basics ❏ Stingray basics ❏ Photography ❏ Videography ❏ Stop-Motion animation ❏ Powtoons	**Advanced:** ❏ Maya expert ❏ 3DS Max expert ❏ Mudbox expert ❏ Video editing expert ❏ Flame expert ❏ Unity3D expert ❏ Stringray expert	❏ A computer for every two participants (students will work in pairs) ❏ A computer for *every* participant ❏ Internet connectivity ❏ Computer with iMovie or Windows Movie Maker installed	❏ Computer with Maya installed ❏ Computer with 3DS Max installed ❏ Computer with Mudbox installed ❏ Digital SLR with HD video recording ❏ Computer with Final Cut Pro or Premiere installed	❏ Professionals to serve as mentors to learners as they progress	
Number of facilitator checks:		Number of basic checks:	Number of intermediate checks:	Number of expert checks:	**TOTAL** ⬇
	Multiply the above number by 5: **x5**	*Multiply the above number by 3:* **x3**	*Multiply the above number by 2:* **x2**	*Rewrite the above number:* **x1**	*Add the four products to the left:*
			Divide the total by 113 and multiply by 100% to get your score:		

GO TO STEP:

Graphic Design | Including wireframing, data visualization, digital illustration, and design for print, web and media

Facilitator Skills		Basic Resources	Intermediate Resources	Expert Resources	Score
Basic: ❏ Sketchbook ❏ Illustrator basics ❏ InDesign basics ❏ Photoshop basics ❏ Piktochart ❏ Canva ❏ Infogr.am ❏ Easel.ly ❏ ChartBlocks ❏ Visualis	**Advanced:** ❏ Data visualization ❏ Illustrator expert ❏ InDesign expert ❏ Photoshop expert	❏ A computer for every two participants (students will work in pairs) ❏ A computer for *every* participant ❏ Internet connectivity	❏ Computers or devices with Sketchbook installed ❏ Computers with Adobe Creative Suite installed (Illustrator, InDesign and/or Photoshop)	❏ Professionals to serve as mentors to learners as they progress	

Number of facilitator checks:		Number of basic checks:		Number of intermediate checks:		Number of expert checks:		**TOTAL** ⬇
	Multiply the above number by 5: **x5**		*Multiply the above number by 3:* **x3**		*Multiply the above number by 2:* **x2**		*Rewrite the above number:* **x1**	*Add the four products to the left:*
						Divide the total by **84** and multiply by 100% to get your score:		

GO TO STEP:

Document Your Vision

Program Name _____ Your Name _____

Use this worksheet to outline the core details of your program. Use the left column to detail what you can do in the next six months and the right column to create a vision for five years from now. Remember, there are no right answers and this will undoubtedly change over time. Answer as thoroughly as possible.

Your 1-Year Vision *Use this column to answer each question based on a program you could **launch within the next 6 months**.*	**Your 3-Year Vision** *Use this column to answer each question based on your long-term vision for your program.*

Participant Ages:

Circle any/all features that apply to your target audience. Feel free to add to this list.

Girls-only Boys-only high-risk affluent beginners experienced techies low-income physical disabilities learning disabilities	Girls-only Boys-only high-risk affluent beginners experienced techies low-income physical disabilities learning disabilities

1-2 sentence summary of the populations you'll serve:

GO TO STEP:

How do you plan to recruit participants?

Circle all descriptors that apply to your program. Add your own "tags" if they're not included.

opt-in after school drop-in registration required class free registration fee participant stipends ongoing limited-duration event series	opt-in after school drop-in registration required class free registration fee participant stipends ongoing limited-duration event series

Duration of your program. Include the following, if applicable:

Dates/Date Range: Open Hours/Time: Total number of hours of instruction:	Dates/Date Range: Open Hours/Time: Total number of hours of instruction:

GO TO
STEP:

Top Three Metrics for Success:

1. 2. 3.	1. 2. 3.

Top Three Constraints

1. 2. 3.	1. 2. 3.

Total Program Budget

GO TO
STEP:

Prioritize the Skills, Tools and Concepts You Want Participants to Learn

Here are some ideas to get you started: 3D Design/CAD, Microelectronics, Design Thinking, Robotics, Rapid Prototyping, Sewing, Knitting, Metalworking, Wearable Electronics, Visual/Graphic Design, Media Production, Woodworking, Leatherworking, Programming, 3D printing, Laser Cutting. *Be sure to consider the resources currently available to you and the existing skills of your team.*

1-2 sentence description of your program

GO TO STEP:

Your Program Title

Your Organization

Your 1-2 sentence program description

YOUR IMAGE HERE

Dates & Time	Location	Ages
[date/time details]	[location details]	[eligibility details]

More Information
[Contact Person & Info]

MAKER PROGRAM STARTER KIT

TEMPLATE: PROGRAM ONE-PAGER

This template is available as a Google Doc in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go!

GO TO STEP:

Community Survey: Help Build Our Maker Program

Thanks for your interest in helping us foster creativity and innovation in local youth by contributing to our new maker program! We're looking for volunteers, materials, tools and more to get this off the ground. Please use this form to tell us how you might be able to contribute.

* Required

Let's start with the basics...

First Name *

Your answer

Last Name *

Your answer

Email Address *

Your answer

Other Contact Information?
Would you prefer we get in touch with you in a different way?

Your answer

Volunteering

Fill out the following sections if you're interested in volunteering with our program. If not, please scroll down to the next section.

How are you interested in volunteering?
You may select multiple options.

☐ Instructor | You'd liek to teach an ongoing class or workshop.

☐ Mentor | You have a technical expertise and can help answer advanced questions from learners.

☐ Organizer | You're a logistics whiz who'd like to help keep us organized in an administrative capacity.

☐ Special Event Volunteer | You're available when we need more adults on hand for supervision and event support.

☐ Speaker | You're interested dropping in to share your technical expertise and story with youth.

☐ Outreach | You'd like to help spread the word about our program.

☐ Other:

If applicable, which of the following would you feel comfortable teaching?
You may select multiple options.

☐ Microelectronics/Sensors/Circuits

☐ Programming (any language)

☐ Graphic design

☐ Web design

☐ Video production

☐ Music production

☐ Animation or CAD

☐ Design thinking and/or user research

☐ Laser Cutting

☐ 3D printing

☐ Sewing

☐ Woodwork

☐ Metalwork

☐ Leatherwork

☐ Other: _____

How frequently can you volunteer?

○ 10 hrs/week or more

○ 5-10 hrs/week

○ 1-4 hrs/week

○ 5-10 hrs/month

○ 2-4 hrs/month

○ 1 hr/month or less

○ Other : _____

If necessary, are you willing to consent to a background check?
Background checks are common practice for programs involving minors. Some volunteer roles may require this.

○ Yes

○ No

TEMPLATE: COMMUNITY SURVEY PG 1 OF 2

This template is available as a Google Form in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go!

GO TO STEP:

TEMPLATE:
COMMUNITY SURVEY
PG 2 OF 2

This template is available as a Google Form in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go!

Participant Benchmarks

* Required

First Name *

Your answer

Last Name

Your answer

Which of the following terms are familiar to you (you could explain their meaning to someone unfamiliar with the term). *
Check all that apply:

- [ ] Design thinking
- [ ] Microelectronics
- [ ] Arduino
- [ ] Raspberry Pi
- [ ] Making
- [ ] Saddle stich
- [ ] Soldering Iron
- [ ] 3D printer
- [ ] CAD
- [ ] Laser Cutter
- [ ] e-textiles
- [ ] Lilypad
- [ ] Big data
- [ ] algorithm
- [ ] for loop
- [ ] prototype

Please rate your level of expertise with the following skills:

0= No Experience with this skill.

1 = Beginner | You have a common knowledge or an understanding of basic techniques and concepts. You often need help when performing this skill.

2 = Intermediate | You are able to successfully complete tasks in this competency. Help from an expert may be required from time to time, but you can usually perform the skill independently.

3 = Advanced | You can perform the actions associated with this skill without assistance. You are recognized as "a person to ask" when difficult questions arise regarding this skill.

4 = Expert | You are known as an expert in this area. You can provide guidance, troubleshoot and answer questions related to this area of expertise and the field where the skill is used.

3D printing and modeling

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Woodwork/Carpentry

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Graphic Design

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Human Centered Design & User Research

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Video Production

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Audio Production

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Circuits & Microelectronics

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Web Design

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Coding

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

TEMPLATE: PARTICIPANT BENCHMARKS FORM PG 1 OF 2

This template is available as a Google Form in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go!

GO TO STEP:

Share the degree to which you agree or disagree with the following statements:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

The program inspires me to do my best work.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The information I'm learning is useful.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The program is fun and engaging.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

The program is clear and well-organized.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I have the tools and resources I need to reach my learning goals.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My teacher is doing a good job facilitating the program.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Is there anything else you'd like to add about your experience with the program?

Your answer

SUBMIT

TEMPLATE: PARTICIPANT BENCHMARKS FORM PG 2 OF 2

This template is available as a Google Form in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go!

Educator Benchmarks

As a maker educator, you will learn new skills and gain confidence as you facilitate your program. Use this form to capture your progression. This can be a useful tool to help document and share "wins" with your team at the conclusion of your program.

* Required

Name

Your answer

Which of the following terms are familiar to you (you could explain their meaning to someone unfamiliar with the term). *
Check all that apply:

- ☐ Design thinking
- ☐ Microelectronics
- ☐ Arduino
- ☐ Raspberry Pi
- ☐ Making
- ☐ Saddle stich
- ☐ Soldering Iron
- ☐ 3D printer
- ☐ CAD
- ☐ Laser Cutter
- ☐ e-textiles
- ☐ Lilypad
- ☐ Big data
- ☐ algorithm
- ☐ for loop
- ☐ prototype

Please rate your level of expertise with the following skills:

0= No Experience with this skill.

1 = Beginner | You have a common knowledge or an understanding of basic techniques and concepts. You often need help when performing this skill.

2 = Intermediate | You are able to successfully complete tasks in this competency. Help from an expert may be required from time to time, but you can usually perform the skill independently.

3 = Advanced | You can perform the actions associated with this skill without assistance. You are recognized as "a person to ask" when difficult questions arise regarding this skill.

4 = Expert | You are known as an expert in this area. You can provide guidance, troubleshoot and answer questions related to this area of expertise and the field where the skill is used.

3D printing and modeling

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Woodwork/Carpentry

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Graphic Design

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Human Centered Design & User Research

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Video Production

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Audio Production

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Circuits & Microelectronics

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Web Design

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

Coding

	0	1	2	3	4	
No Experience	○	○	○	○	○	Expert

TEMPLATE:
EDUCATOR BENCHMARKS FORM
PG 1 OF 2

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GO TO STEP:

Share the degree to which you agree or disagree with the following statements:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

I feel confident facilitating this program.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I am able to effectively answer student questions.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

I understand the landscape of making and can confidently recommend tools and resources to my participants.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My program is clear and well-organized.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My students are having fun in the program.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My students are engaged in the program.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My students are well-behaved.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

My students are meeting their learning goals.

	1	2	3	4	5	
Strongly Disagree	○	○	○	○	○	Strongly Agree

Is there anything else you'd like to add about your experience with the program?

Your answer

SUBMIT

TEMPLATE: EDUCATOR BENCHMARKS FORM PG 2 OF 2

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GO TO STEP:

TEMPLATE: EDUCATOR OBSERVATIONS FORM

This template is available as a Google Form in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go!

TEMPLATE: PARTICIPANT POST-PROGRAM SURVEY

This template is available as a Google Form in the Maker Program Starter Kit's Google Drive Folder. This means all you have to do is copy it, plug in your details, and you're ready to go!

GO TO STEP:

Indicators of Success Worksheet

Use this worksheet to clearly define what success looks like for your program and how you will track it. State each indicator of success in a complete sentence and outline the methods you will use to track your progress. **Be as specific as possible**.

Summary of Results:

	Method 1	Method 2

	Method 1	Method 2
Indicator 1: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		

Indicator 2: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		

Indicator 3: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		

Indicator 4: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		

Indicator 5: Met minimum requirements for success? (Y/N)		
Indicator Succeeded?		

GO TO STEP:

Indicator 1:

How we will track this:

Method 1:	Method 2: (optional)
Quantitative | Qualitative	Quantitative | Qualitative
Who is responsible for this method?	Who is responsible for this method?
We will know we've succeeded by _____/_____/_____ if...	*We will know we've succeeded by _____/_____/_____ if...*
minimum metrics for success	minimum metrics for success
Method 1 Result:	Method 2 Result:
Did this method prove success? Yes No	Did this method prove success? Yes No

Indicator 2:

How we will track this:	
Method 1: Quantitative | Qualitative	Method 2: (optional) Quantitative | Qualitative
Who is responsible for this method?	Who is responsible for this method?
We will know we've succeeded by _____/_____/_____ if... minimum metrics for success	*We will know we've succeeded by _____/_____/_____ if...* minimum metrics for success
Method 1 Result: 	Method 2 Result:
Did this method prove success? Yes No	Did this method prove success? Yes No

GO TO STEP:

Indicator 3:

How we will track this:

Method 1:	Method 2: (optional)
Quantitative | Qualitative	Quantitative | Qualitative
Who is responsible for this method?	Who is responsible for this method?
We will know we've succeeded by _____/_____/_____ if...	*We will know we've succeeded by _____/_____/_____ if...*
minimum metrics for success	minimum metrics for success
Method 1 Result:	Method 2 Result:
Did this method prove success? Yes No	Did this method prove success? Yes No

Indicator 4:
(optional)

How we will track this:

Method 1:	Method 2: (optional)
Quantitative | Qualitative	Quantitative | Qualitative
Who is responsible for this method?	Who is responsible for this method?
We will know we've succeeded by _____/_____/_____ if... minimum metrics for success	*We will know we've succeeded by _____/_____/_____ if...* minimum metrics for success
Method 1 Result:	Method 2 Result:
Did this method prove success? Yes No	Did this method prove success? Yes No

GO TO
STEP:

Indicator 5:
(optional)

How we will track this:

Method 1:	Method 2: (optional)
Quantitative | Qualitative	Quantitative | Qualitative
Who is responsible for this method?	Who is responsible for this method?
We will know we've succeeded by _____/_____/_____ if...	*We will know we've succeeded by _____/_____/_____ if...*
minimum metrics for success	minimum metrics for success
Method 1 Result:	Method 2 Result:
Did this method prove success? Yes No	Did this method prove success? Yes No

GO TO STEP:

MAKER PROGRAM
STARTER KIT

Learner Journey Worksheet

Describe the experience of a learner as he or she advances through your program:

	BEFORE PROGRAM	AFTER FIRST CLASS/SESSION	HALFWAY POINT	AFTER LAST CLASS/SESSION	ONE YEAR LATER
LEARNER SAYS Describe what you hope learners will be talking about at this stage.					
LEARNER DOES Describe action or behaviors you hope to see at this stage.					
LEARNER FEELS Describe the learner's attitude toward making at this stage.					
LEARNER KNOWS Describe key milestones in skill development and understanding for this stage.					

GO TO
STEP:

Activity Title	Brief Description	Source	Category	Content Type	Hours	Difficulty	Grades	Potential Subject Tie-Ins	Advanced Software & Equipment Required	Link
Coding with Paper: Space Race Game	The object of the Space Race game is to navigate your rocket ship safely through the galaxy of aliens and satellites, all the way to the moon. Using the pre-made coding blocks students can create a 'program' of directions for their rocket to follow and complete its mission.	Fractus Learning	Coding	Step-by-Step Guide	1	Easy	K-8	Science; Space	-	https://www.fractuslearning.com/2014/11/18/coding-with-paper-printable-game/
The Perfect Recipe	Do you have a favorite recipe that you want to share with the world? With this project we will use code to write a recipe that looks as good as it tastes.	Google Creative Lab	Coding	Step-by-Step Guide	3	Intermediate	6-12		Computers with internet	https://googlecreativelab.github.io/coder-projects/projects/perfect_recipe/
Make Your Own Mondrian	Paint makes a mess. Code is so much cleaner. Use this project to recreate a classic Modern artwork, Piet Mondrian's Composition II in Red, Blue, and Yellow in your browser using basic web building blocks.	Google Creative Lab	Coding	Step-by-Step Guide	3	Intermediate	6-12	Art	Computers with internet	https://googlecreativelab.github.io/coder-projects/projects/mondrian/
Pop-Up Penguin Game	Make a simple game to play with your friends and family. See if you can find all the penguins without waking the yeti!	Google Creative Lab	Coding	Step-by-Step Guide	3	Intermediate	6-12	Art	Computers with internet	https://googlecreativelab.github.io/coder-projects/projects/pop_up_penguins/
Interactive Space Wizard Game and Controller	Remixing a game that is designed for integration with a MaKey MaKey powered controller is a great introduction to the key concepts of building an interactive game! All you need is a Scratch account, a MaKey MaKey, and some basic construction items!	Digital Harbor Foundation	Coding & Electronics	Step-by-Step Guide	2	Intermediate	3-8	Science; Space	Computers with internet and acces to Scratch, Makey Makey	https://blueprint.digitalharbor.org/projects/interactive-space-wizard-game-and-controller/
5 Chairs Exercise	The 5 Chairs activity encourages students to design models of chairs based on design principles they pull from user profiles. This activity also encourages students to iterate on their designs and practice using different materials.	d.school	Design Thinking	Step-by-Step Guide	1	Intermediate	4-12		-	https://dschool.stanford.edu/groups/k12/wiki/17761/5_Chairs_Exercise.html
Wallet Project	The Wallet Project is a one-hour overview of the entire design process	d.school	Design Thinking	Step-by-Step Guide	1	Intermediate	4-12		-	https://dschool.stanford.edu/groups/k12/wiki/c739e/Wallet_Project.html
Underwater Microphone Kit	Follow National Geographic Explorer, Shah Selbe, on his adventure into the wilds of the Okavango Delta in Botswana to listen for wildlife. At home, you can have your own adventure with an underwater microphone, also known as a hydrophone, by listening to the sounds in your local pond, river, ocean (or bathtub).	KitHub	Digital Media	Kit	2	Easy	K-8	Science, marine science, ecology	Hydrphone Kit	https://kithub.cc/hydrophone/
Make a Music Video	Students work together to create a short music video for a familiar children's song.	Education World	Digital Media	Step-by-Step Guide	5	Intermediate	K-8	Art; Launguage Arts; activity is standards-aligned	Camcorder and Computer with basic video editing software	http://www.educationworld.com/a_lesson/01-1/lp226_05.shtml
DIY Sound Effects	A basic overview of the art of sound effects, including how to make them, how to record them, and even how to automate them.	Instructables	Digital Media	Video Instructions	2	Easy	3-12	Art	Microphone	http://www.instructables.com/id/DIY-Sound-Effects/
MyTube: Make a Video Public Service Announcement	Chances are that the teens you know are watching television and videos, possibly even some videos posted on the YouTube website. What better way to get them involved in topics and issues that are important to them than by asking them to make and edit their own videos? After watching and discussing some online public service announcements (PSAs), help teens write their own script and film a PSA.	ReadWriteThink	Digital Media	Step-by-Step Guide	4	Intermediate	7-12	Art; Launguage Arts	Camcorder and Computer with basic video editing software	http://www.readwritethink.org/parent-afterschool-resources/activities-projects/mytube-make-video-public-30157.html?main-tab=2#tabs

Maker Program Activity Guide

GO TO STEP:

Activity Title	Brief Description	Source	Category	Content Type	Hours	Difficulty	Grades	Potential Subject Tie-Ins	Advanced Software & Equipment Required	Link
Light-Up Paper Helicopters	Use paper and copper tape to create light up helicopters!	chibitronics	Electronics	Step-by-Step Guide	1	Easy	K-8	History, Aviation	-	https://chibitronics.com/light-up-paper-helicopter/
Classroom Paper Circuit Kit	With this project, kids will learn how to add basic electronics to art materials they are already familiar with to make electronic pop-up cards, light-up notebooks and futuristic cities. Students in K-8 will be introduced to simple switches and grades 3-8 will be introduced to serial and parallel circuits.	KitHub	Electronics	Classroom Kit	2	Easy	K-8	Art	Kit sold by Ktihub	https://shop.kithub.cc/collections/classroom/products/classroom-papercircuit
Art Bots	Using a few common, inexpensive items and an electronic toothbrush you can make a fun vibrating robot that makes unique art!	Digital Harbor Foundation	Electronics	Step-by-Step Guide	1	Easy	K-8	Art	-	https://blueprint.digitalharbor.org/projects/art-bots/
Motor Bird	Create a bird that flies in place with a bit of help from a motor, wire, and some straws.	CSW Network	Electronics	Step-by-Step Guide	1	Intermediate	2-8	Physics; Science; activity is standards-aligned	-	http://cswnetwork.org/projects/projectDetails.php?projID=22
Propeller Powered Car	Create a car that relies on a propeller to push it around.	CSW Network	Electronics	Step-by-Step Guide	2	Intermediate	2-12	Physics, Electricity & Magnetism, Force & Motion; activity is standards-aligned	-	http://cswnetwork.org/projects/projectDetails.php?projID=13
LED bracelets	Sew your own LED bracelet and wear it! Your bracelet will light up when you snap it together and close the circuit. Sew your circuit, and then decorate it how you like!	Instructables	Electronics	Step-by-Step Guide	1	Easy	3-12	Art	Sewing Kit	http://www.instructables.com/id/LED-Cuff-Bracelet/
Stylish IoT Neck Warmer Controlled from Mobile Browser	The IoT version of a stylish neck warmer directly coming from this year's Fashion Weeks rolled into London, Paris and New York.	Hackster.io	Electronics	Step-by-Step Guide	2	Intermediate	3-12	Art	Arduino Kit; Computers with internet	https://www.hackster.io/charifmahmoudi/stylish-iot-neck-warmer-controlled-from-mobile-browser-0bb93e?ref=channel&ref_id=424_trending___beginner_&offset=30
Thirsty Plant	A circuit with a special switch turns on an LED to let you know when it's time to water your plant. Green thumbs for everyone!	Digital Harbor Foundation	Electronics	Step-by-Step Guide	1	Intermediate	6-12	Science (plants)	-	https://blueprint.digitalharbor.org/projects/thirsty-plant/
Hack Your Notebook	Create a notebook with a dedicated power supply, flexible power leads and light using copper tape and LED stickers. Customize your hacks to create a notebook as unique as you. Each activity adds a new circuit design technique to your toolbox, allowing you to create beautiful, interactive electronics that help you tell your story.	NexMap	Electronics	Teaching Kit	10	Intermediate	6-12	Art	Computers with internet	http://www.nexmap.org/hack-your-notebook-day-kits
Simple Circuit Town	This workshop explores imagining a city, sketching the city, building the city using cardboard and tape and then illuminating the city with LED lights. In about 2 hours, this project covers topics ranging from geometry, simple circuits and urban design, all through a fun hands-on experience that incorporates both low-tech building and simple circuits	Instructables	Electronics	Step-by-Step Guide	2	Intermediate	8-12	Urban Planning	-	http://www.instructables.com/id/Simple-Circuit-Town/

Maker Program Activity Guide

GO TO STEP:

Activity Title	Brief Description	Source	Category	Content Type	Hours	Difficulty	Grades	Potential Subject Tie-Ins	Advanced Software & Equipment Required	Link
Makey Makey and Scratch Operation Game	Make a fun, life-sized operation game of your own character! Super easy project for all ages!	Instructables	Electronics & Coding	Step-by-Step Guide	4	Intermediate	3-12	Science; Anatomy	Computers with internet and acces to Scratch, Makey Makey	http://www.instructables.com/id/Makey-Makey-and-Scratch-Operation-Game/
Robo-Arm	Create an extendable gripping arm	Howtoons	General Fabrication	Illustration of Activity	2	Easy	K-6	Science	-	http://www.gotta6.com/howtoons/images/pdf/MAKERoboarm.pdf
CD Hovercraft	Create a hovercraft using recycled materials.	Howtoons	General Fabrication	Illustration of Activity	1	Easy	K-8	Science	-	http://www.howtoons.com/?page_id=2505
Soda Bottle Sub	Create a self-propelling submarine using recycled materials.	Howtoons	General Fabrication	Illustration of Activity	1	Easy	K-8	Science, History (submarines)	-	http://www.howtoons.com/?page_id=48
Stomp Rocket	Stomp rockets are an easy project for youth of any age that are comfortable cutting with scissors.	Howtoons	General Fabrication	Illustration of Activity	1	Easy	K-8	Space	-	http://www.gotta6.com/howtoons/images/pdf/HTStompRocketScholasticFNL.pdf
Lever Cowboy	Create a character that comes to life when you pull a string.	CSW Network	General Fabrication	Step-by-Step Guide	2	Easy	2-12	Physics:" Force"&" Motion, Biology: Animal Systems, activity is standards-aligned	-	http://cswnetwork.org/projects/projectDetails.php?projID=12
Lung model	Build a working model of your lungs usin a water bottle and a balloon.	CSW Network	General Fabrication	Step-by-Step Guide	1	Easy	2-12	Biology, Human Body	-	http://cswnetwork.org/projects/projectDetails.php?projID=258
Hydraulic Robot	Make a hydraulic robot out of cardboard and duct tape.	Instructables	General Fabrication	Step-by-Step Guide	3	Easy	2-12	Science, Physics	Drill	http://www.instructables.com/id/Hydraulic-robot-made-of-cardboard-and-scotch-duc/
Kinetic Art	The term "Stick bomb" is used to describe a broad category of kinetic art. A stick bomb can be almost anything that is constructed from flat sticks that are woven together and held under pressure. When a key stick is removed the entire structure flies apart. Designs range from simple single cell bombs that you can hold in your hand to massive chains and grids that are made of thousands of sticks.	Instructables	General Fabrication	Step-by-Step Guide	1	Easy	3-12	Science (chain reactions)	Safety glasses	http://www.instructables.com/id/Stick-Bombs-Exploding-Kinetic-Art/
DIY Pinball Machine	If you love playing pinball, then you will love making this simple machine...a pinball machine. Just recycle some old stuff from around your house ... such as a cardboard box, pins, paper towel roll, a marble, and you will have your own handmade game / toy to play with.	Fractus Learning	General Fabrication	Step-by-Step Guide	3	Easy	3-12	Art	-	http://www.artistshelpingchildren.org/kidscraftsactivitiesblog/2011/02/how-to-make-simple-pinball-machine-with-recycled-materials-crafts-project-for-kids/
Wind Powered Music Box	Create a wind-powered music box using recycled materials.	Instructables	General Fabrication	Video Instructions	2	Intermediate	3-12	Science (wind), Music	-	http://www.instructables.com/id/Wind-Powered-Music-Box/
Tool Cart	Build a simple mobile tool station to keep tools organized and accessible wherever you are in your makerspace.	Digital Harbor Foundation	General Fabrication	Step-by-Step Guide	4	Intermediate	4-12	Art	-	https://blueprint.digitalharbor.org/projects/tool-cart/
LED nametag	If you have access to a laser cutter, make custom nametags with your students!	Instructables	General Fabrication	Step-by-Step Guide	2	Intermediate	6-12	Art	Laser Cutter	http://www.instructables.com/id/LED-Nametag/

Maker Program Activity Guide

GO TO STEP:

Activity Title	Brief Description	Source	Category	Content Type	Hours	Difficulty	Grades	Potential Subject Tie-Ins	Advanced Software & Equipment Required	Link
DIY Camera Slider	Here is a way to build a simple. effective, and wildly inexpensive camera slider in about an hour. This slider is simple to build with basic tools and has a weight capacity of 11lbs!	Instructables	General Fabrication; Digital Media	Step-by-Step Guide	3	Intermediate	6-12	Art	Drill, vice, saw	http://www.instructables.com/id/30-IKEA-Camera-Slider/
Character Business Card	Book report alternative: create business cards for characters or authors.	ReadWriteThink	Graphic Design	Step-by-Step Guide	3	Easy	2-8	Language Arts	Computers with Microsoft Word or similar word processing software	http://www.readwritethink.org/classroom-resources/lesson-plans/book-report-alternative-character-143.html?tab=4
Create an Informative Poster or Presentation	Although most students have previously created a poster, the purpose of this lesson is to help students identify components of effective posters and PowerPoints that make information easily identified and understood while being aesthetically pleasing. The lesson is specifically designed for posters, but the skills can be utilized in creating PowerPoints as well.	LearnNC	Graphic Design	Step-by-Step Guide	3	Easy	4-12	Language Arts, Art	Computers with Microsoft Powerpoint or similar software	http://www.learnnc.org/lp/editions/invent-convent/6705
How to Make an Animated GIF	Help your students create their own animated gifs.	PBS LearningMedia	Graphic Design	Video Instructions	1	Easy	4-12	Art; activity is standards-aligned	Computers	http://ny.pbslearningmedia.org/resource/31199e63-c09c-4d37-9ea5-48ca4d879930/how-to-make-an-animated-gif/
Recycled T-Shirt Tote Bag	Are you looking for a great, low-cost recycling project to do at home or with a group?This is IT! This is a great way to use last season's team t-shirts or a previous year's event t-shirts! Re-purpose an unwanted t-shirt today and easily turn the shirt into a re-usable tote bag.	Instructables	Textiles	Step-by-Step Guide	2	Easy	3-12	Art	Sewing Machine	http://www.instructables.com/id/FASTEST-RECYCLED-T-SHIRT-TOTE-BAG/

Maker Program Activity Guide

MAKER PROGRAM STARTER KIT

Your Program's Title

Your School/Organization

Overview

Your 1-2 sentence program description

Key Information
- Ex: 45 minutes, 2/week, 10 weeks total
- Ex: Type of space
- Ex: Key Tools Required
- Ex: Consumable Materials Required
- Ex: Total Cost of Consumable Materials

Essential Question

According the the Grafton School District, "Essential questions are open-ended, interpretive questions that reflect the most important issues, problems, procedures, and debates associated with the content area. By exploring essential questions throughout their education, students are encouraged to engage in inquiry, debate, and further questioning by revisiting these essential questions throughout their school careers and beyond." If you're unfamiliar with with Essential Questions/Enduring Understandings, feel free to replace this section with your own framework to outline the learning that will occur during in this program.

Enduring Understanding

According the the Grafton School District, "Enduring understandings are statements summarizing important ideas and core processes that are central to a discipline and have lasting value beyond the classroom. They synthesize what students should understand—not just know or do—as a result of studying a particular content area. Moreover, they articulate what students should "revisit" over the course of their lifetimes in relationship to the content area." If you're unfamiliar with with Essential Questions/Enduring Understandings, feel free to replace this section with your own framework to outline the learning that will occur during in this program.

Goal/Themes

What common themes will weave the activities in your program into a cohesive experience? Is there an overarching goal your participants are trying to achieve?

TEMPLATE:
PROGRAM OUTLINE
PG 1 OF 2+

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GO TO STEP:

**MAKER PROGRAM
STARTER KIT**

Class 1: *Class Title Here*

Date & Time

Materials Required:
-

Prep Work Steps:
-
-

Time	Activity
0:00	Introductions...

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GO TO
STEP:

Tool/Skill	Description	Hours	Difficulty to Learn	Skill Category
Tinkercad, 3D modeling	Tinkercad has a fantastic and fun seires of interactive lessons that teach all the basics of navigating and using the software. https://www.tinkercad.com/learn/	1	Easy	3D Technology
123D Design, 3D modeling	123D Desing has a seies of videos for mastering the tool's interface. http://www.123dapp.com/howto/design	2	Easy	3D Technology
123D Catch, 3D capture	Videos and documentation to help you get started, or get more advanced with 123D Catch – a free app that turns photos into 3D models. http://www.123dapp.com/howto/catch	2	Easy	3D Technology
123D Sculpt, 3D modeling	123D Sculpt+ includes in-app training.	2	Easy	3D Technology
Autodesk Fusion, 3D modeling	Fusion has a great series of videos that will help you begin modeling quickly and easily. http://www.autodesk.com/products/fusion-360/learn-training-tutorials; After completing this you can dig deeper on the Autodesk Design Academy by filtering for "Fusion 360": https://academy.autodesk.com/explore-and-learn	2	Easy	3D Technology
3D Printing Basics	Follow the instructions provided by the manufacturer of your 3D printer to print your first project.	6	Intermediate	3D Technology
3D Printing, Comprehensive Introduction	If you don't have someone to teach you in person, take the online 3D printing course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/3D-Printing-Class/	30	Intermediate	3D Technology
AutoCAD, 3D modeling	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started at https://academy.autodesk.com/software/autocad	10	Difficult	3D Technology
Maya, 3D animation	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started at https://academy.autodesk.com/software/maya	10	Difficult	3D Technology
3DS Max, 3D animation	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started at https://academy.autodesk.com/software/3dsmax	10	Difficult	3D Technology
Autodesk Inventor, 3D modeling	The Autodesk Design Academy offers an extensive series of video tutorials to help you get started with Inventor. https://academy.autodesk.com/software/inventor	10	Difficult	3D Technology
Scratch, beginner game design & coding	Scratch includes a well-designed series of starter tutorials when you open the tool. If you need additonal support, the creators at MIT have made a very useful set of guides and videos at https://scratch.mit.edu/help/	2	Easy	Coding
HTML & CSS, web design	Online interactive tutorials like those offered by Codecademy are a great way to learn the basics of web design with HTML & CSS, as well as other programming languages. https://www.codecademy.com/learn/make-a-website	4	Intermediate	Coding
Powtoons, 2D Animation	Powtoons offers a very easy to follow series of video tutorials to get you started. https://www.powtoon.com/tutorials/	1	Easy	Digital Media
Video Production	A great resource to learn or review the basics of video production and editing is the "Filmmaking 101" section of the Vimeo Video School. https://vimeo.com/blog/category/video-school	3	Intermediate	Digital Media

List of Self-Directed Learning Resources

GO TO STEP:

Tool/Skill	Description	Hours	Difficulty to Learn	Skill Category
Adobe Premeire, video editing	Adobe offers well-designed tutorials for all of their most popular products. You can also find resources at Udemy, Treehouse, Coursera and dozens of other online learning websites. Get started with Adobe's intros here: https://helpx.adobe.com/premeire/tutorials.html	4	Intermediate	Digital Media
Photography	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Photography-Class/	30	Intermediate	Digital Media, Graphic Design
Makey Makey	Follow the instructions on Makey Makey's website to get started in minutes! http://makeymakey.com/how-to/classic/	1	Easy	Electronics
Little Bits	Little Bits has developed a series of guides to get educators started. http://littlebits.cc/education/resources#getting-started	3	Easy	Eletronics, Coding
123D Circuits	??? go intro to the tool's interface???	2	Intermediate	Electronics
Circuit Scribe	Circuit Scribe kits include instructions for getting started and beginner activities. They also include a few introductory videos at https://circuits.io/circuitscribe/learn	3	Intermediate	Electronics
Arduino	The Arduino Basic Kit is the only kit you need to get started with all the components to build simple projects and learn how to turn any idea into reality using Arduino. https://projectignite.autodesk.com/shop/product/arduino-basic-kit/	3	Intermediate	Electronics
Circuits & Electronics	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Electronics-Class/	30	Intermediate	Electronics
Wearable Electronics	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Wearable-Electronics-Class/	20	Intermediate	Electronics, Sewing
Raspberry Pi	Because Raspberry Pi has many possible uses, there's a lot you can do with it. Here are a few ways to get started: Demo Programs by Raspberry Pi Foundation https://www.raspberrypi.org/learning/demo-programs/ Follow the 12-Part Adafruit Introductory Tutorial Series https://learn.adafruit.com/series/learn-raspberry-pi Sparkfun offers a Raspberry Pi Starter Kit with a Hookup Guide. Most starter kits will include basic instructions like these. https://learn.sparkfun.com/tutorials/raspberry-pi-3-starter-kit-hookup-guide	15	Difficult	Electronics
Cricut Cutting Machine	Cricut has a well-designed help center with dozens of videos and guides to help you setup your machine and get started. http://help.cricut.com/video-tutorials	2	Easy	Fabrication

List of Self-Directed Learning Resources

GO TO STEP:

Tool/Skill	Description	Hours	Difficulty to Learn	Skill Category
Silhouette Cutting Machine	Silhouette has a blog with videos and how-to instructions for creating a wide variety of projects. Their help section is slightly less comprehensive than Cricut's. http://blog.silhouetteamerica.com/category/how-to	2	Easy	Fabrication
Carvey Desktop CNC Machine	Carvey has a well-desiged and organized series of support resources available at http://carvey-instructions.inventables.com/	8	Intermediate	Fabrication
Boxzy Combination CNC, Engraver and 3D Printer	BoXZY has a limited but well-desiged series of setup instructions available at http://boxzy.dozuki.com/c/1.0_Instructions	8	Intermediate	Fabrication
Laser Cutting	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Laser-Cutting-Class/	30	Intermediate	Fabrication
Glowforge Laser Cutter and Engraver	Glowforge is a new tool without that doesn't appear to have extensive help resources online. The user forum is very active, however: http://community.glowforge.com/	8	Intermediate	Fabrication
Carbide 3D Desktop CNC machines	Carbide offers four simple project tutorials to help you get familiar with your new machine. http://carbide3d.com/docs/tutorials/	8	Intermediate	Fabrication
Pixlr, Photo Editing	Instructions included in-app.	1	Easy	Graphic Design, Digital Media
Adobe InDesign	Adobe offers well-designed tutorials for all of their most popular products. You can also find resources at Udemy, Treehouse, Coursera and dozens of other online learning websites. Get started with Adobe's intros here: https://helpx.adobe.com/iindesign/tutorials.html	4	Intermediate	Graphic Design
Sketchbook	Autodesk provides a useful series of how-to videos at https://support.sketchbook.com/hc/en-us/sections/201932087-Tips-Tricks-and-How-to-Tutorials	6	Intermediate	Graphic Design
Adobe Photoshop	Adobe offers well-designed tutorials for all of their most popular products. You can also find resources at Udemy, Treehouse, Coursera and dozens of other online learning websites. Get started with Adobe's intros here: https://helpx.adobe.com/photoshop/tutorials.html	4	Intermediate	Graphic Design, Digital Media
Adobe Illustrator	Adobe offers well-designed tutorials for all of their most popular products. You can also find resources at Udemy, Treehouse, Coursera and dozens of other online learning websites. Get started with Adobe's intros here: https://helpx.adobe.com/illustrator/tutorials.html	4	Intermediate	Graphic Design, Fabrication
Leatherworking	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Leatherworking-Class/	30	Intermediate	Leatherworking, Fabrication
Sphero & SPRK+	Sphero's The Learning Lab app makes is easy to learn to program your new robot. Start with the programming intro activity to get started. https://sprk.sphero.com/cwists/preview/1671	2	Easy	Robotics, Coding

List of Self-Directed Learning Resources

GO TO STEP:

Tool/Skill	Description	Hours	Difficulty to Learn	Skill Category
LEGO Mindstorms	LEGO Mindstorms has fantastic tutorials to build a variety of robots while learning programming basics. Get startedhere: http://www.lego.com/en-us/mindstorms/learn-to-program		Easy	Robotics, Coding
Robotics	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Robots-Class/	30	Intermediate	Robotics, Coding
Hand Sewing	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Hand-Sewing-Class/	20	Easy	Sewing
Knitting	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Knitting-Class/	30	Easy	Sewing
Machine Sewing	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables.com/class/Machine-Sewing-Class/	30	Intermediate	Sewing, Fabrication
Woodworking	If you don't have someone to teach you in person, take this course offered by Instructables for a fantastic introduction. http://www.instructables. com/class/Woodworking-Class/	30	Intermediate	Woodworking, Fabrication

List of Self-Directed Learning Resources

4

GO TO
STEP:

**MAKER PROGRAM
STARTER KIT**

Marketing Plan Worksheet

Unless you're a classroom teacher with the ability to run your maker program during the school day, you'll likely need to actively recruit students to join your program. This worksheet will help you organize a plan to help do so. Use the blank to add your own ideas:

Who are you targeting with your marketing campaign?

☐ Potential Participants   ☐ Parents   ☐ Teachers   ☐ Youth Organizations

☐ _____   ☐ _____   ☐ _____   ☐ _____

What tools and platforms do you expect to use during your campaign?

☐ Email   ☐ Phone Calls   ☐ Local events

☐ Mail   ☐ Facebook   ☐ Newspapers

☐ Radio   ☐ Twitter   ☐ School Presentation

☐ Flyers   ☐ Instagram   ☐ Presentations to community groups

☐ _____   ☐ _____   ☐ _____

☐ _____   ☐ _____   ☐ _____

How much money (if any) do you have budgeted for marketing?

NOTE: If you decide to pursue paid marketing on Facebook or another platform, do your research first to ensure that your ads are reaching only your targeted audience.

_____

If you have a budget, where do you expect to spend it?

☐ Online paid advertising   ☐ Graphic Design   ☐ Printing

☐ Offline paid advertising   ☐ Video Production   ☐ Photography

☐ _____   ☐ _____

PG 1 of 3

GO TO
STEP:

MAKER PROGRAM STARTER KIT

Identify promising leads:

Even with a zero-dollar budget, you can reach a lot of people... particularly when you use social media. Identify personal contacts and community influencers who may be able to help spread the word about your program and list them below:

PEOPLE TO CALL OR EMAIL Identify local youth organizations, schools, or people within your network who you can contact directly to help spread the word.	TWITTER Are there influencers in your community who have a lot of followers on twitter? Will they share something for you? Ask! Add their usernames below.	FACEBOOK Do any local youth organizations or school have Facebook pages with a lot of members? Will they share something for you? Ask!

PG 2 of 3

GO TO STEP:

**MAKER PROGRAM
STARTER KIT**

Schedule and Track Your Outreach

Review the approaches and influencers available to you and identify those that will help you to most effectively connect with the audience you identified above. Create a schedule for your marketing plan and track the results:

METHOD (Facebook, Call, Email, etc)	NAME OR USERNAME	DEADLINE TO REACH OUT	DATE REACHED OUT	COST (if any)	CAN HELP? Y/N

GO TO
STEP: