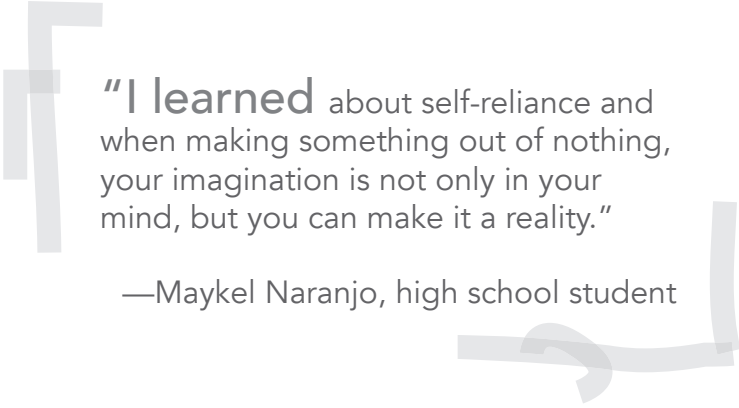


# teach me to makerhappen



“I learned about self-reliance and when making something out of nothing, your imagination is not only in your mind, but you can make it a reality.”

—Maykel Naranjo, high school student

## An Educator's Guide to Makerspace in the Classroom

The Internet is full of theories about Makerspace. You can even find some insightful information on Makerspace in education. What we have found lacking, however, is easy-to-navigate support for teachers who are interested in bringing the Maker Movement to their students in a meaningful way. The intent of this guide is to support you, the lead learner, in your journey as you create your own philosophy. We recommend using this guide as a workbook of sorts, or “field guide,” if you will. As you read through each of the sections, use the tools and activities to help you plan, guide your thinking, and reflect.

Educators today are faced with mounting pressure to produce students who can pass a multitude of standardized tests, use technology proficiently, and have a deep-seated understanding of rigorous content. But what is rigor? There are various definitions of rigor out there, but how many of us have a real grasp

of what that means or what it looks like in a classroom? While we may be teaching more difficult content to help students pass tests, are we really creating experiences that help them solve problems and think critically? In a recent workshop we attended at Education Service Center Region 13, rigor and relevance were tied together in such a way that it became abundantly clear. Make learning rigorous and relevant with thoughtful work, authentic resources, purposeful connections, and high-level thinking. Student work should reflect real-world application that illustrates commitment to learning as essential to their future goals. It should require creativity, originality, skillful discussion, and self-evaluation. Makerspace is one way to create and maintain a truly rigorous classroom.

Take this journey with us and let us teach you how to MakerHappen!

**#makerhappen**





“You receive lessons and get information, but get to experience it in an interactive way.”

—Isaiah Rogers, high school student

# makerspace defined

The first time people hear about Makerspace, they often envision a futuristic, high-tech room. And while the term may have had its origins with a group of German engineers sharing a space, it has evolved into something more. As the introduction mentioned, **Makerspace is a movement.** Groups of people from all ages, backgrounds, and levels of expertise have come together to share ideas and materials. A quick internet search of any major city will turn up a handful of spaces available to skilled craftsmen or hobby enthusiasts of all ages, but these spaces usually require inherent interest and membership fees. Bringing Makerspace to the world of education will empower teachers to expose every student to making.

When first becoming acquainted with Makerspace, one area of confusion is often all of the different, seemingly interchangeable, names. To clarify, we'll address some of the most common terms, but in the true spirit of making, most organizations will adopt an original name that captures their vision. Sometimes you may hear the terms HackerSpace and Makerspace used interchangeably, but there are key distinctions that we feel separate the two. For our purposes, **HackerSpace** generally refers to creation involving electronics. An example of this would be taking apart an old computer and using its parts to create something new. Another component of HackerSpace may be the use of coding programs. **STEAM Lab** refers to a type

of Makerspace that focuses on cross-content learning between science, technology, engineering, art, and math. **Fab Lab** (fabrication laboratory) is another widely referenced concept where an emphasis is placed on computer controlled tools with the end goal of creating a physical product. Since each of these spaces hold value in the field of education, we have settled on Educause's definition of a Makerspace: "A Makerspace is a physical location where people gather to share resources and knowledge, work on projects, network, and build." Using this definition, you may see how a Makerspace could contain elements of all the above-mentioned subsectors.



## Makerspace is a Community

Educause's definition of a Makerspace: "A Makerspace is a physical location where people gather to share resources and knowledge, work on projects, network, and build."

Based on this definition, it is easy to see why Makerspace has started to take root in the educational system. A central goal of most schools is to prepare students to be college and career ready, and this means providing students with opportunities to collaborate, create, and hone their problem-solving skills. Because the traditional classroom has been charged with covering a large knowledge base, there is often not enough time for organic application. Educators have been looking for other avenues to provide students with real world implementation of knowledge, and many have turned to Makerspace.

The history of Makerspace is found mostly in the present, which means each of you can play a role in shaping it. We hope this field guide provides you with the tools you need to be a pioneer in bringing a Makerspace to your classroom or campus.

Now that you have an understanding of what a Makerspace is, take some time to reflect on your new learning.



## APPLY

### Three, Two, One

What are three new things you learned?

3

2

1

What are two things you thought were interesting?

2

1

What is one question you still have?

1

### **note from coach**

Don't let yourself get bogged down in jargon! You have the power to remove the barriers of learning.

Jump in!

**#makerhappen**



"It's good to use your imagination."

—Madeline, 2nd grade student

# philosophy

## so let's explore our beliefs

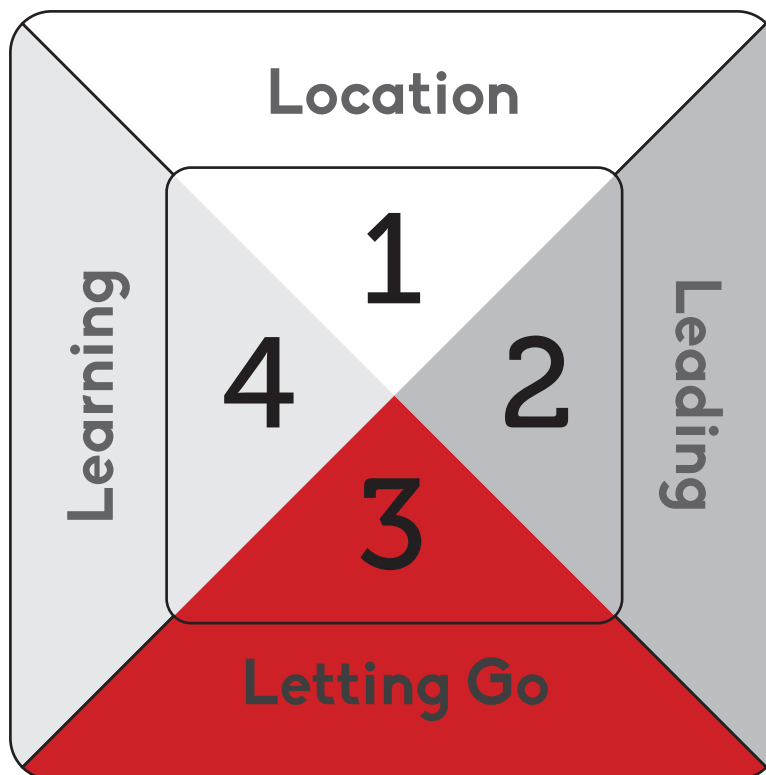
We believe that the most critical factor is the actual implementation of the learning culture and community. This is the point that makes a Makerspace enduring and ultimately successful. We believe that Makerspaces are not field trip destinations because they should not be defined by their physical space. We firmly believe that learning by making can happen for every student, every day. Finally, we believe that when given the tools to scaffold learners and create culture, teachers can foster a community of self-directed learners who are 21st-century career ready.

So, that being said, what's next?

# the 4 Ls

Here are the 4 Ls that capture our style. We will visit each of these in depth throughout the following chapters of the field guide. The 4 Ls describe the leadership and pedagogy that are basic to the MakerHappen philosophy.

1. Location
2. Leading
3. Letting Go
4. Learning



## 1. Location

Makerspaces are not defined by the materials in them, but by what they enable—making. (Makerspace Playbook, 2013). It is not necessary to have large budgets or grant-funded materials in your space. Sure, 3D printers are ideal and very useful, but you can still make without them. Makerspaces can happen anywhere. They can be big or small,

permanent or mobile. They can be as large as an empty classroom or workshop or as small as a box that can be tucked into a closet. Whether you have large budget materials or re-purposed items, remember: don't let stuff define your space. Let making and learning define your space.



## 2. Leading

Gardens have gardeners, sheep have shepherds, and Makerspaces have Spacemakers. Spacemakers are the individuals who facilitate the learning and drive growth. The chief requirement to be a Spacemaker is to have a vested interest in the movement and the school. They must also be resourceful, collaborative, possess perseverance, and always seek learning themselves. In addition, they need to be able to model the principles and ethics of the Makerspace in front of and alongside the students. They become the facilitators of learning rather than the keepers of the answers. Spacemakers are masters of questioning, but they know it is okay to not know the answer. They do not feel insecure or threatened by not knowing answers. In fact, through their modeling, the students gain confidence and will begin to be the experts. This results in independent learners who can mentor others. The best part is that good leaders model questioning, so the effect multiplies until you have a culture and community of learners who know how to think.

## 3. Letting Go

Now that you have an appropriate space and leaders who question, you need to be sure your programming is not over-choreographed. Stations are easy and can be a great start to scaffold makers into independent learning; however, it is not a true making environment without choice. As Cooper (2013) stated, "Diversity and cross-pollination of activities are critical to the design, making and exploration process, and they are what set Makerspaces and STEAM labs apart from single use spaces" (para. 2). Terrifying as it might seem at first, you need to let students

go. Giving up control can be scary, but, a well-programmed Makerspace will produce results that quickly calm your fears.

## 4. Learning

It is a common assumption to think that learners will automatically be self-driven. This is not the case. If the culture of self-direction is not already present in your learning environment, a scaffold will be needed to develop and maintain a learning environment that will meet the ongoing instructional and behavioral needs of your diverse student population. In the learning section, we will visit in-depth how you as a Spacemaker can supply the tools you need to cover and assess your mandated curriculum. Creating successful, self-directed learners is key.

In summary:

1. Remember: don't let stuff define your space. Let making and learning define your space.
2. The best part is that good leaders model questioning, so the effect multiplies until you have a culture and community of learners who know how to think.
3. Choice is important.
4. Creating successful, self-directed learners is key.

### **note from coach**

Location: Don't let stuff define your space.

Leading: You are the Spacemaker, the questioner, the maker of independent thinkers!

Letting Go: Choice is key. Take a deep breath and LET GO!

Learning: You are the strategic designer who facilitates self-directed learning.



## APPLY

### Philosophy

You've had a chance to read the MakerHappen philosophy, but everyone comes to the Maker table for a different reason. Given that you have picked up a copy of the manual, you probably already carry some Maker baggage. Unpacking your prior and newfound knowledge, use the sentence stem below to create a Maker vision for your school. Your vision will act as a touchstone as you continue to work through the guide. As you acquire new knowledge, your vision may shift, so we have provided you with a second space. We highly recommend that you work in collaboration with your Maker team to create a final vision.

#### Guiding Formula:

(*who*) does (*what*) for/with (*whom*) for the purpose of (*outcome*)

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#### Final Vision:

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#### Example:

*Region 13's MakerHappen seeks to support schools that wish to establish a Makerspace on their campus, no matter the budget, to promote creativity, collaboration and problem-solving.*

Retrieved from SXSWedu lecture "Michigan Makers Project," 2016