

## **4-16-15 STEAM & the Maker Mentality for School-age Youth Q&A Log** **Questions from Live Demco Webinar as answered by Amy Koester & Janet Nelson**

### Age Groups

#### **Q: Are there specific ages you would work with for either the suggested makerspace activities or the STEAM programs?**

A: All of the activity examples I shared in the webinar come from programs that I offered in my library for a maximum of 30 children in kindergarten through fifth grade. So, I could have 30 kids across that age range in any given program (although there were usually more second- and third-graders than any other age). This meant that there was a large range of abilities amongst the kids, which lead to some needing more hands-on assistance than others. For younger children, or kids who struggled with self-directed activities, I invited caregivers to stay in the program with their kids (parents were required to stay in the building while their kids were in programs, so they were nearby regardless). It was also pretty easy to identify the (usually) older kids in each program who picked up on the activities quickly and had more social tendencies; I would sometimes tap these kids to help their fellow program attendees troubleshoot if I couldn't jump immediately in for whatever reason. Lots of great bonding across ages and grade levels resulted from this type of mentoring.

#### **Q: How do we get older teens to engage in the maker idea, when most of them just want to engage in Instagram and YouTube?**

A: In my experience, the way to get teens engaged in any activity is to make it relevant to them. When it comes to maker activities that means giving them the means to make things that they care about. Are your teens super tied in to YouTube? Then start offering some maker activities that center around creating and editing video content. Pay attention to the things that teens are already electively spending their time on, then figure out ways to turn those interests into "hooks" to get them involved in programs.

Another way to engage older teens is to enlist their help in the role of mentors in maker activities and/or programs. Many teens are looking for volunteer opportunities, and plenty are just interested in doing something that may be helpful for others. Giving these teens a bit of training to be able to facilitate and/or co-facilitate maker activities with you in the library is a way to help making become relevant to them and their interests.

#### **Q: Do you feel that the concepts of STEAM can be used for adult learners?**

A: Ooh, absolutely. Everyone is curious. Unfortunately for some adults, society has kind of shut that down or they feel like society has. For instance, last night we had a stargazing night on the village green which was next to the library. We have a lot of light pollution, but we took the library's telescope outside and were able to see Jupiter. The kids were really excited, but a lot of the adults were asking what was going on as they were leaving the library and they wanted to look too and were amazed at what they could see. People are always interested in how things work and discovering new things. By all means, if you are doing programs for youth, do things that include their caregivers and those conversations will continue at home.

These programs can be good multi-generational opportunities and can also get older kids working with younger kids as mentors. When older youth and adults are getting excited and showing kids how exciting science can be, it helps to keep the kids more interested.

## **Operations**

### **Q: What is the initial cost? Space required? Time required?**

A: The initial cost for any of the activities I shared — both STEAM and makerspaces — can be as low as \$0; that is, you can absolutely start off using materials you already have on hand, in spaces that already exist in your library. For a maker activity, all you need are some supplies (I LOVE recyclables!) and a tabletop. For STEAM, the only additional thing you need is a bit of time to share the learning concept of the program. Not a lot of overhead. When it comes to how much time it takes to prepare these types of activities, that's going to depend on your program planning style. I would say, however, that you don't have to go into a program as an expert on the topic of the program — just like when working the reference desk, you just have to be able to find some resources in the library to help answer questions or dig deeper. In fact, it can be a powerful co-learning experience for the program leader to be obviously learning new things throughout the program alongside the kids.

### **Q: Are there grant sources available to incorporate STEAM programs at public libraries? What are some ideas for partnerships?**

A: Yes! There are great grants available for STEAM at the public library. One of my favorite resources for finding grants is on the LEGO® Education website: <https://education.lego.com/en-us/lesi/grants/sources-of-funding>. Many states or state libraries have grants and mini-grant funds, usually funded through the LSTA, that they make available for libraries in their states, so reach out to your state folks. Finally, there are lots of businesses and corporations that are interested in supporting both formal and informal STEAM education, so visit your local chamber of commerce and ask around. A grant of even \$500 from a local business with a vested interest in kids being STEAM-competent is a great place to start. Also, if you're in a school and are looking for ways to fund specific equipment, try using [DonorsChoose.org](https://www.donorschoose.org) for your project. Research of funded classroom and school library projects on the site shows that folks are very interested in funding STEAM learning opportunities.

You can also take a look at the Library Fundraising and Grant Resources PDF that is listed in the Downloads & Resources section for this webinar ([ideas.demco.com/webinar/steam-program](https://ideas.demco.com/webinar/steam-program)).

### **Q: How important do you think it is to relate all the STEAM activities to library books in your collection?**

A: That is a great question. I always try to have a book connection in my programs that I share — 100% of the time, I have books on the topic or related topics in the program space and I encourage the kids to check them out if they are still interested at the end of the program. As often as possible, in addition to having those books, I will “Book Talk” a title or read a couple of pages of a non-fiction book to introduce our main concept to try to actually use the materials in the collection in an active way.

Keep in mind, when I choose a science topic, I am not picking a topic because I already know a lot about it, so I go to the collection to find information and pictures so that I can put on the program. Those are the books that I use to provide the background information for the program.

### **Q: How much time do you recommend be set aside for a maker activity?**

A: I started out offering 45 minute maker programs, but I found that some kids were interested in working on their creations a bit longer. As a result, I bumped the time for my program up to an hour, but made it clear to kids and caregivers that, as long as a kid was meeting their caregiver outside the program, a kid could leave when they were done. That way kids who felt they had a complete experience in 45 minutes could leave without becoming bored, but kids who wanted that extra chunk of time to keep tinkering had it without feeling rushed out of the program. Find what works best for your community.

**Q: What do you call your programs? Our parents don't know STEAM which may be turning them off.**

A: I've had great success just putting the word "science" in many of my programs — Fun with Science (if you want to be nondescript about your topic), Airplane Science, Slime Science, etc. Even for some of the STEAM programs that focus on technology or engineering, I'll still use the term "science" in the title because that seems to be a topic about which lots of kids are interested and parents are prioritizing. That said, sometimes I'll forego anything that clearly brands a program as a STEAM program in favor of a topic that sounds exciting all on its own — think "Make Your Own Video Game," "Egg Drop Challenge" or "Super Scratch Game Creators."

**Q: How do you get community involvement to help with this?**

A: Ask! Really and truly, many of times it is as simple as asking folks you see in your library frequently, or posting a flyer on the public information board of the library. There are so many people in this world who are passionate about things, and their passion is such that they want to share it with others. Have conversations with those people in your community to see if they'd be appropriate to bring in to help you lead a program.

Lots of people are also happy to contribute donations of things they have on hand. When my old library started a LEGO® Club, for instance, we bought LEGOs but also solicited donations. A handful of adults brought in buckets of their children's old LEGOs that had been sitting in the basement or garage unused for years (note: donated LEGOs can be dusty, so throw them in a lingerie bag and run them through the dishwasher). Same can go for recyclables; I once asked for tennis ball canisters for my egg drop program, and a few library patrons were happy to bring in their old ones.

**Q: How do I get "buy-in" from our faculty and administration?**

A: How you make the case successfully is going to be dependent on your unique faculty/staff and administration. Are they most usually convinced by stats? If so, ask libraries you know that are already doing the types of activities you want to try to get some hard data on participation and impact.

Are they concerned that they're not expert enough in STEAM content areas or maker skills? Invite them into your library for a few quick demo activities so they can see:

- 1) It's not about expertise, it's about informal learning in a social context; and
- 2) The types of activities best fit for kids this age are not inherently complicated, so expertise need not be a concern.

I guarantee your staff and administration can recognize that they are *at least* as capable as a fifth grader at STEAM and maker activities. Are they concerned that these types of informal activities don't fit with learning goals/program goals/organizational mindset? Find some research to share about the benefits of hands-on exploration and experimentation as some ammo for your argument, including research that shows kids who engage in these activities — which are ultimately age-appropriate play — actually learn more and stay more focused in their more formal learning environments.

And if worse comes to worse, try to make a case for a 3-month pilot experiment in which you offer the type of programming you want to do. This trial can be a way for administration to gauge the level of staff time and equipment that may be necessary to scale up, but it'll also be a way for them to see in no uncertain terms just how engaged kids are in these opportunities.

**Activities/Programs**

**Q: How often do you hold your school age science programs?**

A: That has varied depending on the library I was with. At my last library, I was the only children's librarian and pretty much the only one doing school-age activities so programs were offered once a month and sometimes done more often in the summer when the kids were out of school. That was all that there was capacity for. Skokie has a larger team working with youth so sometimes there are as many as one program a week. It is important to look at your staffing to determine capacity and then decide how often you want to prioritize STEAM programs as part of your offering.

In a school setting, it doesn't need to be a full on program. It can be as simple as a self-guided activity at a table or a 5-10 minute experiment before you get on with your other business.

**Q: Do you hold your programs as a regular monthly/weekly or are they special times?**

A: I've done it both ways. For a while at my old library, I offered one science/STEAM program per month, but day of the week and time varied. We had a pretty consistent following, with some new faces each time (perhaps due to availability on different days of the week). For LEGO® Club, which happens at my current library on a weekly basis, we have slightly smaller attendance week to week but a large core group of attendees who know they can count on LEGO Club happening when they're free on Monday evenings. Find what works for your community, but also for your staff schedules.

**Q: What is that on the "Why is STEAM in the library?" slide?**

A: Yes! That's a MaKey MaKey on that slide. I love MaKey MaKeys. You should really check them out: [makeymakey.com](http://makeymakey.com)

**Q: Can you use Scratch with Chromebooks?**

A: Yes. Scratch is a free, web-based programming language, so you can use it with any computer with an Internet connection. You can also download an app version.

**Q: In the egg drop — were they hard boiled or raw eggs?**

A: Our eggs were raw. I kept a close hold on them until it was drop time to prevent any premature breakages, but raw definitely got the excitement of the drop up to 11.

**Q: What's the time frame for the engineering/egg drop class?**

A: My egg drop program was 60 minutes long — 5 minutes to introduce the concept, 40 minutes for building/tinkering, and 15 minutes outside for the drops.

**Q: Has anyone incorporated a 3-D printer in their maker space?**

A: Lots of libraries have ventured into 3-D printing in their maker spaces, including Skokie Public Library, where I work. I recommend doing some online searching to see what, if any, libraries or other makerspaces in your area have 3-D printers, then schedule some time to visit or chat with them. You can also pose questions about brands, troubleshooting, programs, etc., on your preferred library listserv.

## **Spaces**

**Q: Is that mobile makerspace lockable?**

A: The mobile makerspace that was in one of the images in my slides did not include locks, with the exception of the drawer that held sharp implements like box cutters. It's up to you what type of features you would want — drawers, cabinets, carts, etc. — and would be willing to purchase for your library. Shop around to scope out your best options.

**Q: What is the best physical layout? How many students will be using this area at one time? What is the best way to begin?**

A: The answers to these questions are completely dependent upon your unique library. In general, the best physical layout is one that lets kids have a bit of personal space as they work, and that allows the program instructor to be able to move easily from participant to participant. The number of kids in your activity space at any given time will depend on the size of your space and the number of chairs/tables/stations that can accommodate kids. I think that the best way to begin is to start small with hands-on maker activities using simple supplies — like the marshmallow towers challenge, which needs only mini-marshmallows and toothpicks — and use those activities as tests to see what your optimal space and layout might look like.

## School/Classroom Libraries

**Q: I want to establish a "make space" in my middle school media center. Do you have recommendations for items to start with?**

A: The materials you start with depend on the types of activities you want your kids to engage in. Do you want to start with building challenges (e.g., build a bridge that can support the weight of all the Hunger Games trilogy books, build a roller coaster for marbles)? Then you can start with lots of recyclables, tape, and scissors.

Do you want to start with digital content creation? Then you may want to get new, or repurpose existing, tablets or laptops. There's no one correct way to do a makerspace so long as kids are able to use it to learn and apply new skills. The activities, and thus the supplies, are up to you.

**Q: Do you have suggestions for how to start and manage a makerspace in an elementary school library?**

A: In terms of starting a makerspace, my first tip would be to find a space in your library — either a flexible space, or a space you repurpose for making — that will allow kids to engage in maker activities. Build your activities around your ability to facilitate the maker time.

For example, if you're going to be directly supervising all maker activities, you can do more in-depth projects. If kids will be making in self-directed ways, opt for simpler, shorter activities. Let your activity types dictate your materials, and thus your supply organization and storage. It's probably a good idea for elementary spaces to keep materials in their storage containers when the space isn't in use. All tools that are sharp or could otherwise be potentially dangerous should be kept separately in a staff-only part of the library and used only under direct supervision.

Figure out when maker activities can best fit in your school library's schedule. I know lots of school librarians who open their spaces first thing in the morning for early arrivers, and also keep the space open during lunches for interested kids. Find what works for you and your students.

**Q: I'm interested in what it might look like to have a makerspace in a classroom rather than a library, for example, in a fifth grade classroom where the teacher teaches all the fifth-graders in the school. Storage solutions? Themes? Appropriate tools?**

A: I've never been a teacher, so to a certain extent this answer is my best guess. I would guess that you would want your classroom makerspace to be easily accessible by all of your students, but also in a space that is not distracting when it's time for other focused activities.

I might pick a nook of the room and drag an extra table and some chairs to the space so that the physical space is accessible throughout the day. I'd also get some sort of storage — like a cart or bins — that can be closed and moved out of sight as needed, but is also clearly organized and accessible for when kids are able to engage. This helps them operate in a largely self-directed manner.

Once again, themes are completely up to you based on your goals, and appropriate tools will depend on the types of activities kids can engage in. Just make sure any tools that could be potentially dangerous are kept safely locked away when not in use and are only used when kids are supervised directly.

**Q: In an elementary school setting when our time with students is very limited (ex: 30-45 minutes, including browsing & check out), any ideas on how to adapt to meet this time restriction?**

A: I would go the route of offering small self-directed challenges in a space in the library. Kids can, if they so choose, take the challenge and build something, conduct a small experiment, etc. in the time they have available before browsing for and checking out books. Even a 5-minute maker activity can make a big impact on the type of skills and creativity the kids can use throughout the day.