

Get STEAM Rolling!

Demystifying STEAM and Finding the Right Fit for Your Library

AMY KOESTER

If you've attended a library conference, browsed webinar offerings, or read a youth services blog anytime in the last year, chances are you've heard of STEAM, which stands for **science, technology, engineering, arts, and mathematics**. More and more libraries are offering STEAM programs in one form or another, and still more libraries are making booklists on STEAM topics to help connect to the Common Core State Standards (CCSS) being adopted by their local schools.

STEAM is having quite an influence on how youth librarians do their jobs and interact with young customers. And not without reason.

STEAM programming has the ability to allow libraries to engage young customers who may not have been drawn to storytimes, book clubs, or craft programs. These programs are the bread and butter of youth library programs, but they do not represent the full spectrum of what we can do with the collections we have. We have lots of interesting, engaging titles in both fiction and nonfiction, including plenty of topics that tie in with core STEAM subject areas and values: the sciences, creativity, innovation, and creation.

Offering complementary programming in the library, then, becomes a logical next step. Do we have the resources? Check! Do we have the customer interest? Check! Do these programs meet library goals for programs and services to children? Check! If you peruse your collections, talk with the children you serve, and think deliberately about how you can meet your library goals, you'll see that, in one form or another, STEAM can fit.

Libraries come in many shapes and sizes with plenty of variations in staffing, funding, and support. As a result, STEAM

programs and services will not look the same from one library to the next. Resources should not be a deterrent for libraries looking to add STEAM elements to what they offer children. Neither should a perceived lack of staff specialty; staff do not need to be content-area experts to offer high-quality STEAM experiences in the library.

Any children's staff member can plan and offer programs, and there is a fit for every library. From passive programs to full-blown STEAM events, the options below should help get you started.

Passive STEAM Programs

Passive programming is like dipping one's toes in the water before plunging in: testing things, getting a feel for how your customers respond. They're especially ideal for libraries with limited budgets, limited staffing, and limited space and are easily modifiable to work within the framework of individual libraries.

Observation Stations



Amy Koester is Youth and Family Coordinator with the Skokie (IL) Public Library.



Supplies for an airplane science program include a hair dryer, ping-pong ball, paper airplane instructions and materials, and books on airplanes and flight.

Carve out a space for an ongoing observation activity—an empty table by the reference desk, a flat surface in the children’s area, or a cart wheeled to a convenient location. Add something dynamic to the station—try an ant farm, a terrarium with interesting plants, caterpillars, or white flowers in vases of dyed water. Children will be naturally curious, and they’ll spend plenty of time just looking at them. Give caregivers an info boost by stocking the area with questions for their kids and a few nonfiction texts relevant to the observation station. The best part of an observation station? Kids will want to return to the library to observe if and how it changes.

Make-and-Take

Let children create a science tool they can take and use outside of the library. STEAM make-and-take projects include bird watching journals, constellation guides, leaf-rubbing kits, and weather journals. When paired with brief instructions for using the project at home, these make-and-take options create opportunities for sustained STEAM engagement. The library probably has these craft materials on hand as well.

Take-Home Activities

Libraries have tons of nonfiction titles that provide ideas for small experiments and science projects. Yet these volumes can look dated and intimidating, meaning many customers never look to see the great hands-on activities they contain. The library owns these books, so use them! Find and test one or two activities from a book, then make an instruction sheet so families can do the activities at home. Ta-da! The great ideas in library books get shared, and families do informal learning together. Just remember to cite your sources.

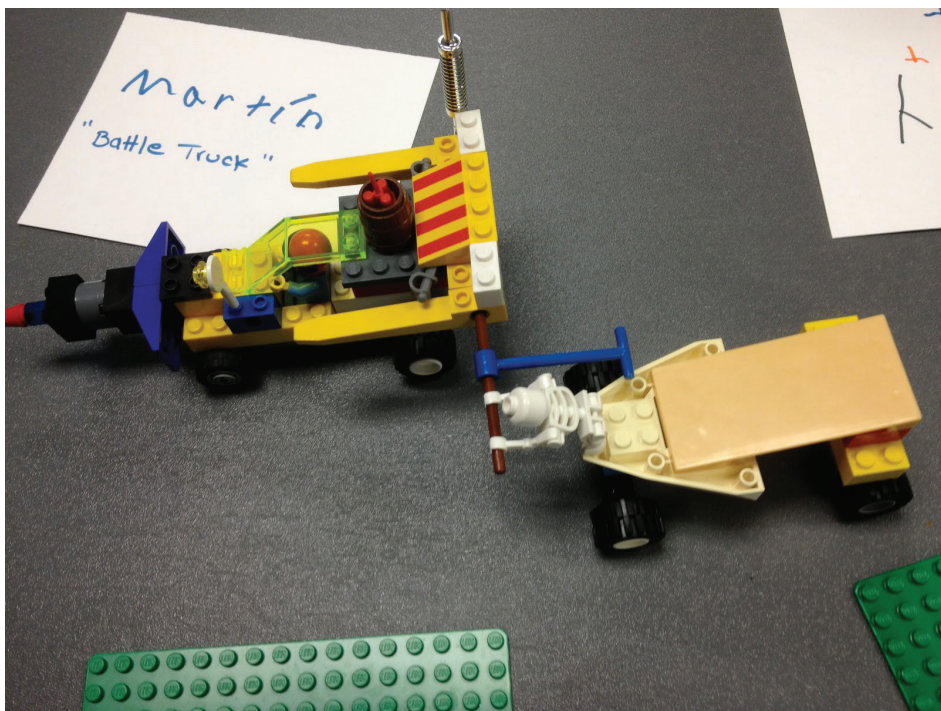
Take-Home Kits

Give caregivers the resources they need to engage their kids in a specific STEAM topic by creating take-home kits. Each kit can contain resources on a chosen theme—nonfiction, and, if relevant, fiction titles, activity instructions, a science-themed CD, and/or a quality nonfiction DVD. Wrap these items with a ribbon, add a tag with the kit’s theme and an invitation to do science at home, and you’ve got ready-to-go kits at your customers’ fingertips.

STEAM Elements in Existing Programs

If you want to integrate STEAM into your program offerings but don't have time, resources, or a level of comfort to create whole new STEAM programs, think instead about various ways to work STEAM elements into the programs you already do.

For example, whenever you share books with children, regardless of their ages, you have an opportunity to incorporate STEAM. There are so many tremendous nonfiction titles available, and the options keep growing, thanks to the CCSS. Choose a nonfiction title that adds another dimension to your storytime or reading program. I've found that reading a nonfiction title on a topic helps children engage more deeply with a fiction book on that topic, and that is a truly positive result of a simple story swap.



LEGO Club is a STEAM program hit! To attract new patrons/customers, display the kids' creations in the library following a club meeting.

Experiments

Many preschool storytimes end with a craft, and crafting can pretty seamlessly be swapped out for an experiment. Doing a storytime about the beach? Instead of a beach scene craft, make a "sink or float?" station. Experiments don't have to pair with a theme, either; children will be engaged in a hands-on, what-will-happen activity regardless of its connection to the storytime theme. The bonus? Doing and talking about experiments are great for building children's vocabulary and concept knowledge—both extremely important from an early literacy perspective.

Counting Rhymes and Activities

Do you use any "five little" rhymes or fingerplays in your programs? Those are math, which is STEAM. Use visuals to reinforce numbers as you do these rhymes with preschoolers. Measuring and sorting activities are also common activities in storytime; use these program elements deliberately to make the STEAM learning connection.

Stand-Alone STEAM Programs

Stand-alone programs allow children to interact deeply and meaningfully with a STEAM concept. Create your own programs or utilize the many resources and program plans shared

by librarians online. Check out the ALSC Blog and Pinterest for ready-to-go ideas.

Preschool Science Storytime

Build an entire storytime experience around a STEAM concept. My strategy is to share a story that includes our concept, talk about the concept in depth, and visit several hands-on activity stations prepped with experiments that reinforce our concept. One example is chemistry; we read *Whopper Cake* by Karma Wilson and Will Hillenbrand because cooking is chemistry; we talk about physical versus chemical changes; and we explore self-directed stations with dissolving, liquid mixing, and chemical interaction experiments.

School-Age Science

Science programs for school-age children often work best when kids are nearly constantly engaged in an activity. I open these programs with a brief introduction to our topic; in a volcano program, we might look at diagrams of volcano types, talk about how volcanoes erupt, then watch a brief video clip of an eruption.

We spend the bulk of the program doing science—in this case, building volcanoes out of dough and canisters (for the magma chambers). Kids love to see their science in action and put to

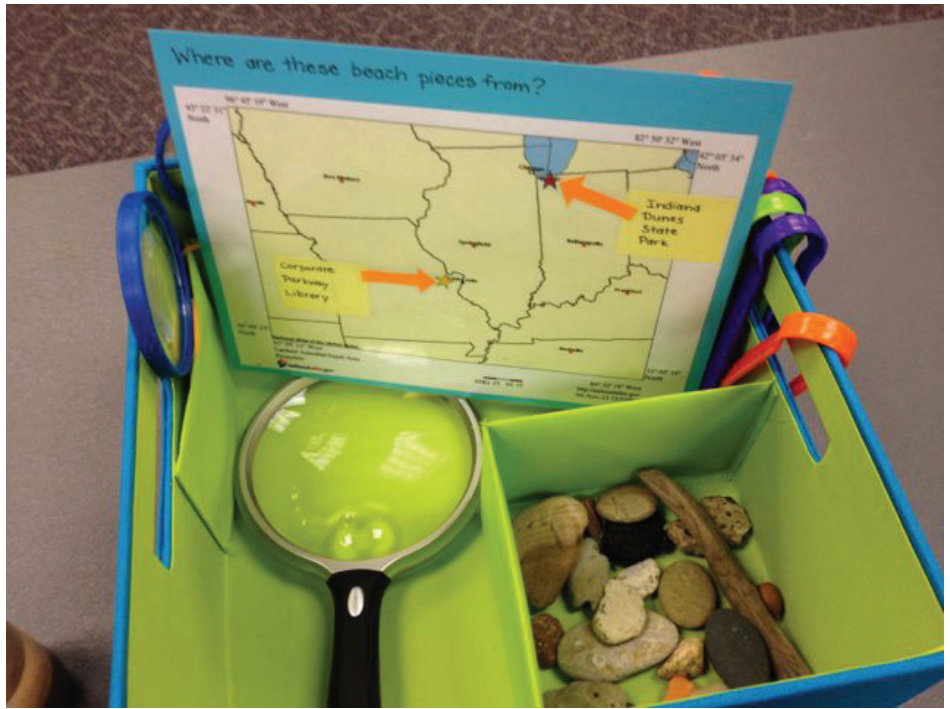
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the test, which is how I end these programs. Add some baking soda and vinegar to those volcanoes, and run for the hills!

School-Age STEAM

Full-on STEAM programs can allow children to interact with ideas in a way they might not get to in a highly structured setting. This open-ended process allows them to engage in trial-and-error experiments of creation, and it also gives them ample opportunity to innovate.

Two STEAM program options include making forts and aliens, each with a variety of craft supplies and recyclables. After building forts, which come in all shapes and sizes, have a battle with Popsicle stick catapults and pom-pom balls (simple machines!); after making aliens, talk about how animals' features tell about their habitats.



A simple beach observation station includes an assortment of items collected from a beach, such as rocks, sticks, acorns; a map showing where the items came from; and a magnifying glass.

Recurring “Club” Programs

Recurring STEAM programs build a consistent attendance base among your user population. Find a day, time, and meeting frequency that works for your library, and be sure to advertise recurring programs once they are established. Examples of recurring programs include:

- **LEGO Club.** Many children absolutely love to build with LEGOs, and the library can engage that love. Use program funds or a grant to buy plenty of LEGOs, then set up tables at which children can build creations. Free building is great, and so is setting a new theme challenge for each meeting. Leave time at the end of each meeting for children to share their creations with the group. Finished creations are displayed in the library until the next meeting.
- **Coding Club.** Reserve some of the library’s computers or a computer lab to offer introductory coding activities for school-age children. Go the traditional route and program in HTML or another common programming language, or take advantage of the influx of visual, kid-friendly programming languages now available, such as Scratch. With some coding practice, kids will be creating and playing their own games in almost no time.
- **Knitting Club.** Knitting requires counting, spatial thinking, and a dose of creativity—which is STEAM to the max. Gather supplies, instruction and pattern books, and a seasoned knitter or two to help children get started. This program has great potential for socialization between children, too, as they get to chat while their hands are busy working their needles.

The STEAM Fair

If you want to go all out in your STEAM programming, consider putting in the time to offer a STEAM fair open to the entire community.

Showcase kids’ creations. If you have a makerspace or regular STEAM programs in your library, chances are kids are creating interesting things that would make great exhibits for a STEAM fair. Kid-sourced exhibits can also include working with home-schooling groups, scouting groups, and schools that do not offer students their own science or invention fair. Showcasing children’s creations helps the kids develop a great sense of pride in their work and ownership in the library.

Display community projects. Work together with community groups with connections to STEAM, such as technology and engineering companies. Many communities also boast recreational clubs dedicated to model rocketry, gardening, metal-working, recycling technology, and more—usually with members who are thrilled to share their STEAM enthusiasm. The library can also tap after-school programs, science museums, and other groups who regularly engage children in STEAM activities.

With so many programming options, there truly is a STEAM fit for every library. After considering available resources, consulting collections, and perusing other libraries’ program plans, libraries can commit to offering engaging and informally educational STEAM programming. STEAM excites and enthralls children, and it builds the library’s community reputation while helping us meet our traditional goals. So go ahead—get STEAM rolling! 🚀