Why should I include STEAM in my library program?

It's long been said that the library is the largest classroom in the school. It's also said that if your school library doesn't have it, your public library will. From maker spaces to art museums, libraries have a plethora of opportunities to enhance and support student creativity. The power of STEAM (science, technology, engineering, arts, and math) becomes even stronger when combined with literacy. In the library or media center, we have a natural platform for allowing students and patrons to build and discover.

S is for Science

Weed Your Nonfiction Collection

Science titles should generally be no more than 5 years old. Look at your collection. Look and retain books with the following:

- Color illustrations
- Informational text features
- Newer than 5 years
- Current technology
- Newest editions
- No misinformation, especially about health issues

CREW Method

Purchase New Science-Related Titles


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**Do Experiments in Your Storytimes and Lessons.**

Whether you have kids build bridges with marshmallows and toothpicks during a storytime on bridges or you do a solo demonstration of Mentos in a soda, kids that are involved in lessons learn more.

- Talk to your science teachers for ideas
- Check out Pinterest.
- Model safety procedures
- Explain all rules prior to proceeding
T is for Technology

Copy the Classroom

If the library is the largest classroom in the school, adopt the same technology as the classroom.

- Use a white board
- Get a device and teach
- Demonstrate use of tablets
- Go to the classroom if necessary
- Host author/illustrator Skype visits

Experiment with New Websites and Apps

AASL annually selects the best websites and apps for teaching. Learn how to use them and implement them in your program. Whether you use them for your own teaching or you teach your students how to use them, the following suggestions may help you navigate the waters.

- Watch the tutorials at AASL
- Introduce one at a time to your faculty or staff
- Make your own tutorials
- Ask your students to create tutorials
- Use Piktochart for your annual report tool

My new favorites are Adobe Spark (infopics), Photos for Class (great for CC use of photos) and Tween Tribune (current events articles can be multi-leveled and come with a quiz)

Gather Resources

Online resources abound for incorporating STEAM in your library programming. Both Junior Library Guild and School Library Journal have STEAM Pinterest boards. Gather community volunteers who will speak, demonstrate, or teach in your library. The STEM to STEAM website also has many resources.

E is for Engineering

Get a Makerspace

Whether you develop a full-fledged space with 3-D printers, a saw, and a sewing machine, or you designate a table with baskets of materials, get a makerspace. Kids love to create, and you reinforce STEAM.

- Include books, pictures, and posters for inspiration and
If funding is an issue, make a wish list, placing a box in the hall or lobby for donations.
Assign a volunteer to make sure the area is safe, clean, and stocked.
For more ideas, check our Pinterest boards and Ellyssa Kroski’s blog post, A Librarian’s Guide to Maker Spaces.

Start with Your Youngest Group

From your preschool group to your adults, you’ll find that hands-on activities naturally draw collaboration and conversation. Your youngest kids have no fear or inhibitions; their nature will allow them to think out of the box, often inspiring older children.

- Develop a 3 part storytime: introduce the concept, read a book, and follow it with an art project, engineering activity, or science experiment.

Collaborate with the Experts

You don’t have to know everything. From your science and social studies teachers in your building, to experts in the field, people-in-the-know can enrich your programming. It’s the perfect opportunity to bring in would-be advocates while turning over the reins to someone who can fluently speak STEAM.

- Contact your local Rotary club or other organizations for contact info.
- Your public library system may also have a list of speakers.

Purchase Engineering-Related Titles

A is for Art

Be Proactive with Promotion of Arts Books

When you plan your lessons or storytimes, make a conscious effort to include art books (dance, music, photography, art, writing).

- Talk about the artwork in picture books you share.
- Make sure your booklists include STEAM books.
- Include different formats in your booklists, such as ebooks, audiobooks, and videos.
- Subscribe to the new JLG Arts Category (Grades 2–6) and automatically receive the best fiction and nonfiction to supports the arts in your library.

Purchase New Books that Feature Art or Artists


STEAD, Philip C. Ideas are All Around, illus. by author. 48p. Roaring Brook. 2016. ISBN 9781626721814. JLG Category: E: Easy Reading (Grades 1-3).

M is for Math

Look for Ways to Add Math Activities

From promoting new biographies about mathematicians to using graphs and charts in your lessons, math in the library is a win-win for everyone.

- Line your kids up by call number of the books they checked out
- Teach them how to put nonfiction books in order
- Even young readers can sort books by hundreds
- Create a people graph: sort your class by fiction vs. nonfiction checkouts
- Promote your cookbooks
- Teach them how to find books on their level in Destiny Quest

And Then Some integrated Ideas for STEAM

Establish Programming and Services

Develop everyday advocacy opportunities by scouting the community for guest speakers and content experts. Host a STEAM club during lunch or after school. Turn your library into an art museum or science fair hall.

Build a STEAM Pinterest Board to Collect your Ideas.

The power of minions is strong on social media. From science experiments to book ideas, Pinterest is overflowing with ideas for your STEAM program. Search for STEAM/STEM boards and add them to your own. Follow pinners like NSTA (National Science Teachers Association), We Are Teachers, NAEA (National Art Education Association), ISTE (International Society for Technology in Education), and AIMS Center for Math and Science. JLG has a board you can follow.

Integrate Nonfiction into your Storytime or Collaboratives.

Just because it’s storytime doesn’t mean you have to read a fairy tale. Today’s nonfiction can certainly be just as entertaining, but also informative. Make time to read from your nonfiction to older students. Just a teaser may be all they need. Narrative nonfiction abounds. One easy way to ensure new nonfiction every month is to subscribe to the following JLG categories. You’ll get new books as they are published. There are also three categories of series nonfiction you can also receive. (Social studies/history titles will be included in nonfiction and biography categories.)

- Early Nonfiction Elementary (two categories)
- Science Nonfiction Elementary
- Arts Elementary
For Further Reading
Look for JLG Shelf Life blog posts throughout the month of March.

Amy Koester’s article at SLJ “Full STEAM Ahead: Injecting Art and Creativity in STEM”

Leanne Brown’s article Developing Programs and Resources in the School Library to Support STEM Education

Follow JLG’s Pinterest Board, STEM/STEAM

FREE RESOURCES
JLG Booktalks to Go http://www.slj.com/category/collection-development/jlg-booktalks/
JLG STEM/STEAM, BTG Pinterest https://www.pinterest.com/juniorlibraryg/
NSTA Post Presentation Post @ JLG Shelf Life http://juniorlibraryguild.com/news/category.dT/shelf-life

OTHER AWARDS/NOTABLES TO CONSIDER
Robert F. Sibert Informational Book Awards
NCTE Orbis Pictus' Nonfiction Award
ALA Notable Children's Books
The American Association for the Advancement of Science/Subaru SB&F Prize for Excellence in Science Books
YALSA Nonfiction Award
State Readers’ Choice Awards

NONFICTION AND INFORMATIONAL TEXT RESOURCES
The Uncommon Core Blog
Ink Think Tank
ReadWorks
Newsela
Great Websites for Kids
Free Reading.net
Your local school and public library databases

SLJ Series Made Simple

Junior Library Guild

- Nonfiction Early Elementary
- Art Elementary
- Nonfiction Elementary
- Science Elementary
- Nonfiction Middle
- Nonfiction High

About the presenter:

Deborah B. Ford, JLG’s Director of Library Outreach, is an award-winning library media specialist and international speaker with almost thirty years of experience as a classroom teacher and librarian in K–12 schools. Traveling across North America, she does workshops, library coaching, and professional development for school and public libraries. Deborah is the author of JLG’s Booktalks to Go and Everyday Librarian @ School Library Journal. She also maintains an award-winning coordinating online resource at LiveBinders.com. Contact her at dford@juniorlibraryguild.com. Follow her on Twitter @jlgdeborahford.
To Do List: Integrating STEAM in Your Library Program

What’s your take-away for this session? Name three strategies you want to improve or try when you return to school.

1.

2.

3.

Aha Moment:

Affirmation Moment:

Inspiration Moment:
10 Strategies for Amazing Makerspaces

1. Establish the connection of your makerspace to learning.
2. Brainstorm ideas that connect your space to your community.
3. Evaluate your physical space for possibilities.
4. Gather materials, enlisting your community and its resources.
5. Plan for safety and general guidelines.
6. Enlist professionals for trainings, workshops, and other presentations.
7. Train your staff, volunteers, and users.
8. Don’t be afraid to start slowly.
10. Don’t be afraid to fail, ask for help, or start over.

Why should I have a makerspace? Isn’t it just a fad?

Makerspaces offer the perfect opportunity to revitalize and reinvent your library. By creating areas where students can create, imagine, and experiment, your print collection becomes a perfect complement to your learning commons. Libraries have long been known for the source of knowledge through books and later the internet. Makerspaces allow your community to consume the knowledge and produce something original.
But How Do I Start?

I recently visited Chattanooga Public Library where their fourth floor is a makerspace. With areas for textiles, technology, 3D printing, and zine making, it’s a haven for the do-it-yourselfer, experimenter, and explorer. Programming varies from exploratory personal time to guest speaker/demonstrator, as well a special events. For example, they used their 3D printer to make knitting needles, and then they yarn bombed the second floor (Figure 1).

In the same library, there were stations for different interests such as a drawing table with a light box. Other libraries have bookshelves filled with cardboard scraps, glue, duct tape, and LEGOs. Still other spaces include power tools and woodworking shops. What is a makerspace?

A makerspace (sometimes written as two words) is a place where students can gather to create, invent, tinker, explore, and discover using a variety of tools and materials. (Diana Rendina [http://renovatedlearning.com/2015/04/02/defining-makerspaces-part-1/](http://renovatedlearning.com/2015/04/02/defining-makerspaces-part-1/)) Yours will look different from anyone else’s, but how do you start?

1. **Establish the connection of your makerspace to learning.** Whether you have a table, a lab, or an entire room for your makerspace, first consider how it will connect to the learning. Why do have the space? What do you hope to accomplish? How can you tie it to the curriculum? What subjects will be represented—robotics, engineering, science, math, literature? Be prepared to answer why you’re reinventing the library so that students can have an opportunity to use knowledge they’ve gained.

2. **Brainstorm ideas that connect your space to your community.** If you’ve wanted to collaborate, a makerspace is your perfect opportunity to bring in the community. From experts
to hobbyists, your support team is just outside your walls. From lending a physical hand to
donating supplies and leading special events, involving your community provides a chance for
advocacy. Is there a business that may donate old equipment? Is there a local photographer
who can teach a class? Would your shop teacher set up a small area? Is there a parent who can
take the lead to recruit specialists? Is there a volunteer who would supervise “open hours?”

**3. Evaluate your physical space for possibilities.** Look at your space with fresh eyes. How can
you rearrange the room to accommodate a center, table, or stations? Can you weed the
reference section and create an area? Is there a room with good visibility nearby? Can you use
a rolling cart or a table with slider feet? Use an online program to experiment with the new
floor plan. Let go of unnecessary furniture that just collects dust and create a space that invites
people to think. Think about noise level. Remember the library is a learning commons and a
makerspace needs the comfort level to speak. Placing it next to a quiet reading area won’t
work.

**4. Gather materials, enlisting your community and its resources.** Using your community
resource list, create a wish list of desired materials. Don’t hold back. You never know who may
have a box of materials “just in case someone needs them.” Think big. December is a great time
to ask as people are often in a giving spirit, while others are thinking about a tax write-off.
Advertise what you want through social media and newsletters. Set up an area to collect
materials. Since your makerspace will consume items, designate a central location for quick
drop offs. Make it easy for them to donate.

**5. Plan for safety and general guidelines.** While it goes without saying that you need safety
guidelines and rules, be sure to follow district or county guidelines as well. If you’re using
power tools, for example, you may need to create a permission slip for your users. Pikes Peak
Library System has a [Makerspace Use and Release Agreement](#). Check out their guidelines as a
starting point for creating your own. Set age requirements for particular areas and post them.
Offer certification classes. Post rules and procedures.
6. **Enlist professionals for trainings, workshops, and other presentations.** Simply put, you don’t have to be the expert. Enlisting others allows you to supervise while providing an opportunity to allow others to share their knowledge.

7. **Train your staff, volunteers, and users.** Try things out before you let kids do it. Make sure everyone knows the rules and procedures. Create a simple video to post on your website. This is the time to pass out your release agreement.

8. **Don’t be afraid to start slowly.** Have a Maker Monday if you want to start small. Stock up a cart or a spare table or desk with supplies and see what happens. Just because you don’t have a 3D printer or power tools doesn’t mean you can’t have a makerspace. The point is in the creation of a product and the process for its fruition, not the parts that made it.

9. **Document. Document. Document.** Take lots of pictures and video. Post your successes. Keep track of expenses. Write thank you notes to generous donors and include pictures of what was made. If there is an accident, be sure to document in print and photograph what happened. Makerspaces are the perfect program for marketing. Kids want to see themselves online. They get ideas from other projects. Your community sees the excitement and either volunteers or gets out its checkbook.

10. **Don’t be afraid to fail, ask for help, or start over.** It may not be rocket science, but it really is ok to fail. We learn from our mistakes. Blog about what you learn, so that others can benefit. Don’t add this to your plate all by yourself. Gather a village and see what you raise.

**Tip:** See Stocking Up School Makerspaces for a wish list of supplies.

[http://makezine.com/2013/08/21/stocking-up-school-makerspaces/](http://makezine.com/2013/08/21/stocking-up-school-makerspaces/)