

STEAM & Día: Offering Informal Learning with a Mind Toward Diversity

Amy Koester | September 2015

Hello!

- Amy Koester
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On Our Agenda

- **What is STEAM, and how does diversity fit into the conversation?**
- **Diversity Starting Points**
- **Sample Programs by Age**
- **Five Tips for Diverse STEAM Programs & Resources**
- **Final Questions**

**What is STEAM, and
how does diversity fit
into the conversation?**

STEAM

science

technology

engineering

arts

math

STEAM Timeline

- **1983 - *Educating Americans for the 21st Century***
(National Science Board Commission on Precollege Education in Mathematics, Science, and Technology)
- **1989 - Education Summit convened by President George H.W. Bush**
- **1994 - Goals 2000: Educate America signed into law by President Bill Clinton**
- **2001 - No Child Left Behind signed into law by President George W. Bush**

STEAM Timeline (cont.)

- 2002 - "Teach arts and sciences together" TED Talk by Mae Jemison
- 2007 - *Rising Above the Gathering Storm* (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine)
- 2011 - *Expanding Underrepresented Minority Participation: American's Science and Technology Talent at the Crossroads* (National Academy of Sciences, National Academy of Engineering, and Institute of Medicine)

So why does this matter?

- **Minorities are underrepresented in STEM fields.**
- **Minorities are underrepresented in STEM education.**
- **Minority students' STEM test scores are consistently below their white peers'.**

So why does this matter?

- It's not about aptitude. It's about:
 - Preparation
 - Access
 - Motivation



Preparation =
Early Exposure

BOOMbox Grades 3-5

Tuesdays, 4:30-5:30 or 6:30-7:30 pm (Limit 6)

Mars Surface Exploration March 10 Using Planet Four, a citizen science project, we'll explore and classify the surface of Mars to help planetary scientists better understand Mars' climate.

Light Painting March 17 Modify flashlights and other handheld light sources to create artistic, color-filled images.

Gas Off March 31 See which gases best inflate balloons on top of water bottles.

Mythbusters April 7 Should you follow the five-second rule? Test this myth and more using super mythbusting skills.

Super Scratch Body Boosters April 14 Create a virus-blasting video game using the Scratch programming language.

The Bat Cave April 21 Make your own super-power gadget using the 3D printers and Arduino microcontrollers.



DNA Extraction May 5 Extract DNA from fruit and yourself using household items.

LED Paper Circuits May 12 Make plain paper come to life with tiny surface LED lights powered by a basic circuit.

DIY Spectrometry May 19 Use light to find out the composition of various materials.

BOOMbox Boot Camp

Civic Science Boot Camp Participate in two open-source Public Lab projects to determine water quality from local sources. Must attend both days.

Monday, March 23 and Tuesday, March 24
Grades 3-5: 1-3 pm (Limit 6)
Grades 6-8: 3:30-5:30 pm (Limit 6)



BOOMBOX

BIG & SMALL

Unless noted, registration is required at 847-673-7774 or calendar.skokieilibrary.info.

BOOMbox Grades 6-8

Mondays, 4-5:30 pm (Limit 8)

Challenge Accepted! March 9, 16, 30
Each week, we'll propose a new engineering challenge and compete in teams.

Forensic Science Mysteries April 6, 13, 20
Use a forensic science technique from fiber analysis to ink chromatography to solve a case with the help of science.

Science for the Win May 4, 11, 18 Help with groundbreaking research through crowd-sourced citizen science projects. Drop-in event.

BOOMbox Adults

Astrobiology: Learn about Life in Space Learn about astrobiology, the study of life on earth and in space. Charles Cockell, professor of astrobiology at The University of Edinburgh, lectures on the origins and history of astrobiology; life on Earth, Mars, and Europa; the search for exoplanets and extraterrestrial intelligence. Please plan to attend all six weeks.

Mondays, March 9-April 13, 6 pm (Limit 10)

What's in My Shampoo?

Chemicals and Health Do you wonder about how BPA, flame retardants, and other chemicals affect our health? Should we be concerned? Come be part of the library's chemicals and health group where we will learn the ins and outs of chemicals and what impact they may have on our health. Please plan to attend all six weeks.

Thursdays, March 12-April 16, 6 pm (Limit 10)



Google Earth Using tablets, go places you've never been before.

Thursdays, April 23 or May 7 or May 21, 7 pm (Limit 8)

Access =
Plentiful & Rich Options



**Motivation =
Interest-building & Relevant**

Questions so far?

How do I begin
planning a STEAM
program that is
equitable?

Diversity Starting Points

1. Build around diverse books.
2. Include diverse cultural perspectives of your topic.
3. Bring in professionals w/ expertise & passion.
4. Involve youth in “doing” STEAM.

Diversity Starting Points

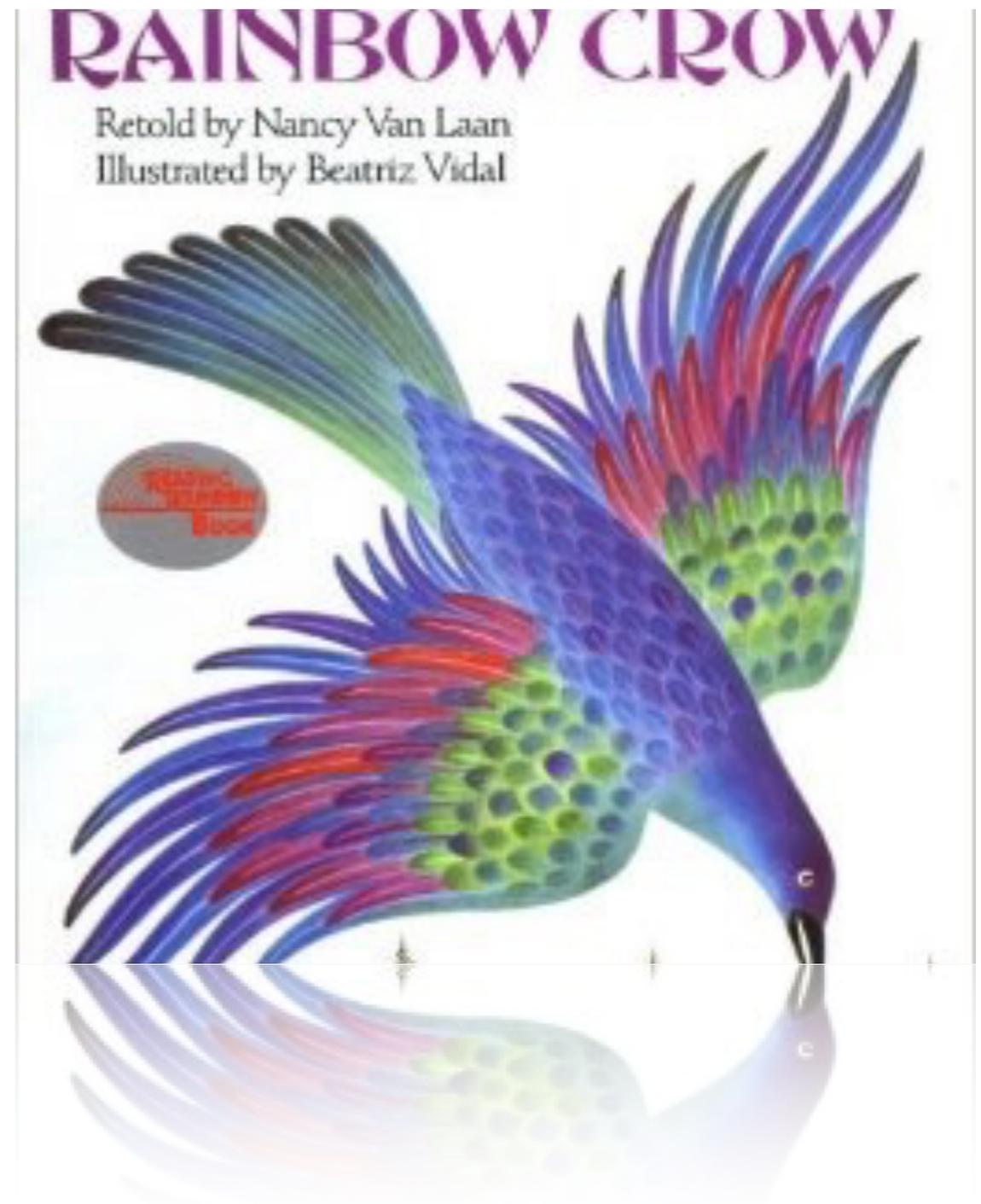
5. Designate a space with activities to do at any time.
6. Engage the whole family—book discussion, festival.
7. Encourage sharing first-person experiences.
8. Consider how to bring an existing program to a new audience.

Questions so far?

Sample Programs by Age

Warmth in the Winter: Preschool

- 20-30 minutes
- Read or tell winter animal myths from different cultures
- Provide materials that might be insulation (feathers, wool, fat, etc.)
- Make insulated “mittens” and test them in ice water
- Other diverse titles on display



Colors & Patterns Around the World: K–2nd grade

- 30-45 minutes
- Talk about the color wheel & how colors complement
- Share books with patterns around the world (try to include every continent)
- Use colored pencils to create colorful patterns based on world examples or imagination



Candy of Many Cultures: 3rd–5th grade

- 45-60 minutes
- Invite a cook/baker/pastry chef to talk about the science and importance of taste
- Offer candies from around the world to taste
- Create a map of where the candies are from & a system of ranking them



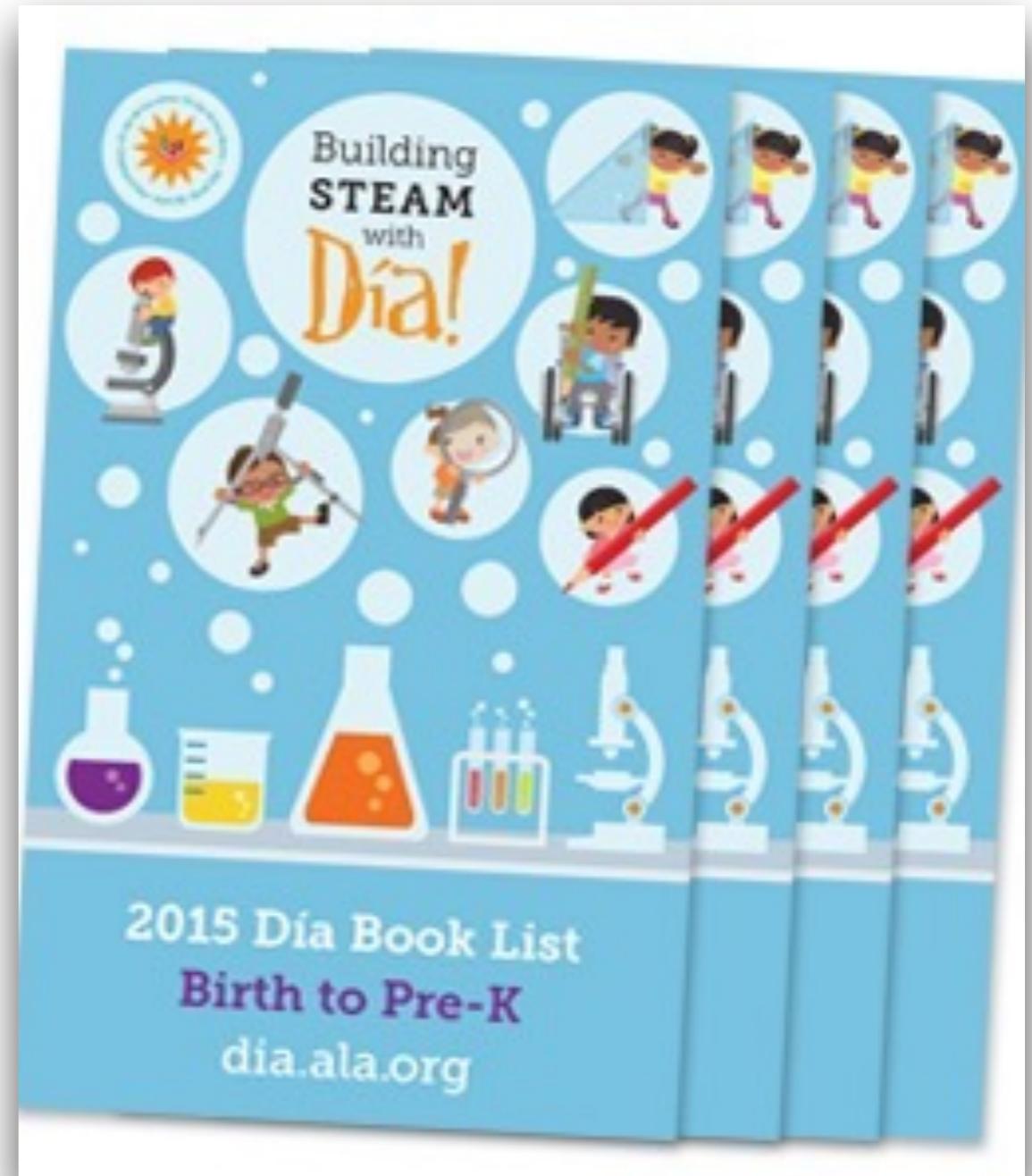
Questions so far?

Five Tips for Diverse STEAM Programs

1. Make it engaging & participatory.
2. Make it motivating.
3. Highlight diverse STEAM.
4. Use all resources available.
5. Create partnerships & collaborations.

Resources

- Building STEAM with Día book lists (out now)
- Building STEAM with Día Toolkit (forthcoming)
- Día Program Registry
- *SLJ*'s STEAM board on Pinterest
- Your Stacks
- Your Customers



Thanks for participating!

Final questions?

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