

Ready, Set, Create! How Engineers and Libraries can Collaborate to Make a World of Difference

The webinar will begin at 2:00 p.m. (MT) and will be recorded.

While you're waiting:

- 1) Find the toolbar – it will either be on the bottom or top of your Zoom window
- 2) Introduce yourself in the chat box (please select “Share with All” *not* “Share with Panelists”)
- 3) Click audio “Join by Computer” – you won’t have microphone access

Tip for viewing: You can resize and move the location of the video and slide screens by clicking and dragging them

Facilitator Introduction

Brooks Mitchell (Space Science Institute)

Justine Rose (AECOM)

Susannah Hamm (Cuyahoga County Public Library)

Jeannine Finton (American Society of Civil Engineers)

Claire Ratcliffe (Space Science Institute)

Today's Agenda

Welcome

Poll Question

What is Project BUILD?

American Society of Civil Engineers

Hands-on Activity: *Who Dirtied the Water: A Role-Playing Activity*

Hands-on Activity: *Low Tech Water Filter for High Impact Clean*

Share-outs from the Library/Engineer Duo

Q&A

Poll Question

- What percentage of US bridges are deemed “structurally deficient”

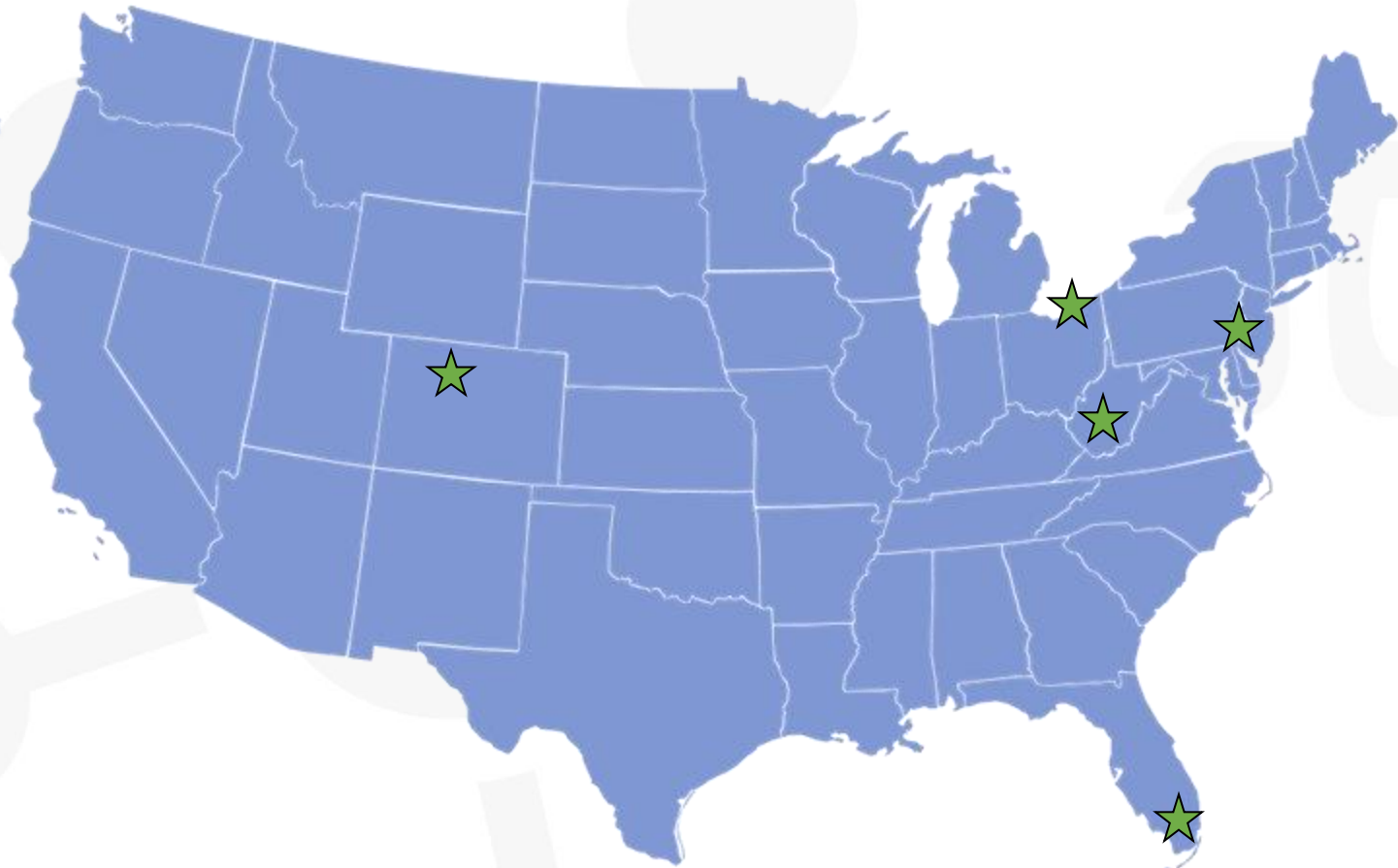
Poll Question

- Where can you find the longest bridge that travels continuously over water?

Project BUILD



- Anchorage, AK
- Philadelphia, PA
- Kanawha Co., WV
- Ft. Lauderdale, FL
- Cleveland, OH
- Greely, CO



Project Goal

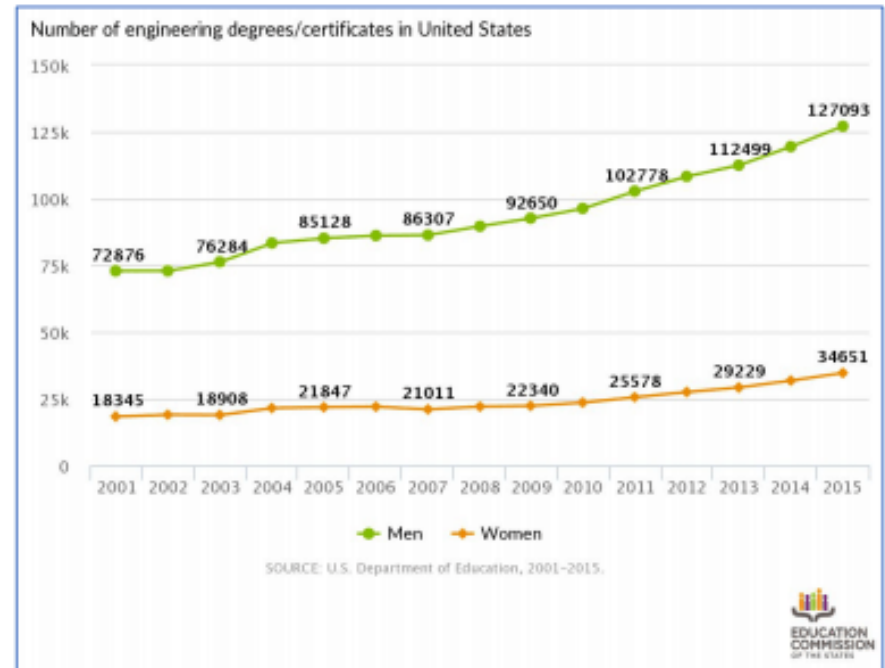
Investigate whether the infusion of public library resources and services with STEM-related technology resources, challenge-focused learning experiences, and partnerships with ASCE volunteers increases the interest and engagement of youth in grades 2-5 in STEM activities and awareness of STEM-related career opportunities.

Our Challenge

- African Americans: 14.8 percent of the college-age population (18 to 24 years old); earned only 3.8 percent of engineering degrees.
- American Indian/Alaska Natives: 0.9 percent of the college-age population; earned only 0.3 percent of engineering degrees.
- LatinX: 21.4 percent of the college-age population; earned only 9.6 percent of engineering degrees.

Source:

<http://www.nacme.org/news/blog/183-a-status-report-on-minorities-in-engineering>
(2016)



77% of public libraries serve populations of less than 25,000 people

- **16,000 library locations**
- **1.5 billion visits per year**
- **Latino Use: 72%**
- **African-American Use: 69%**

Figure N-1. Public Library Outlets in the United States, Fiscal Year 2012

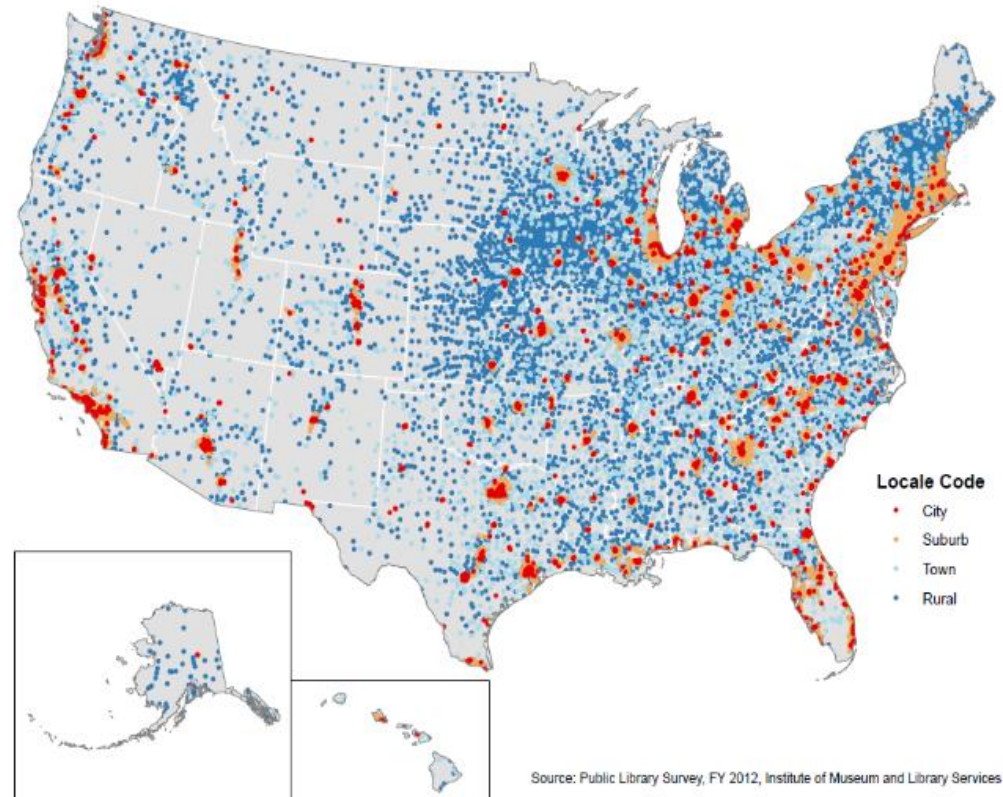
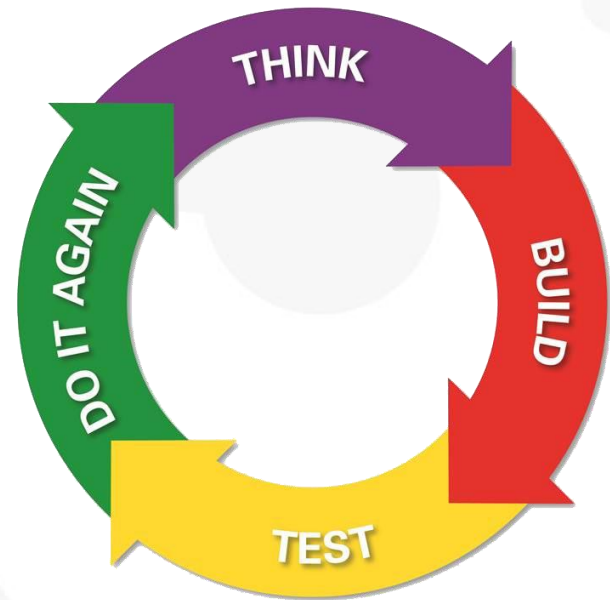




Photo Credit (1 and 2): AARLC, Broward Co., FL



Credit: Philadelphia Free Library

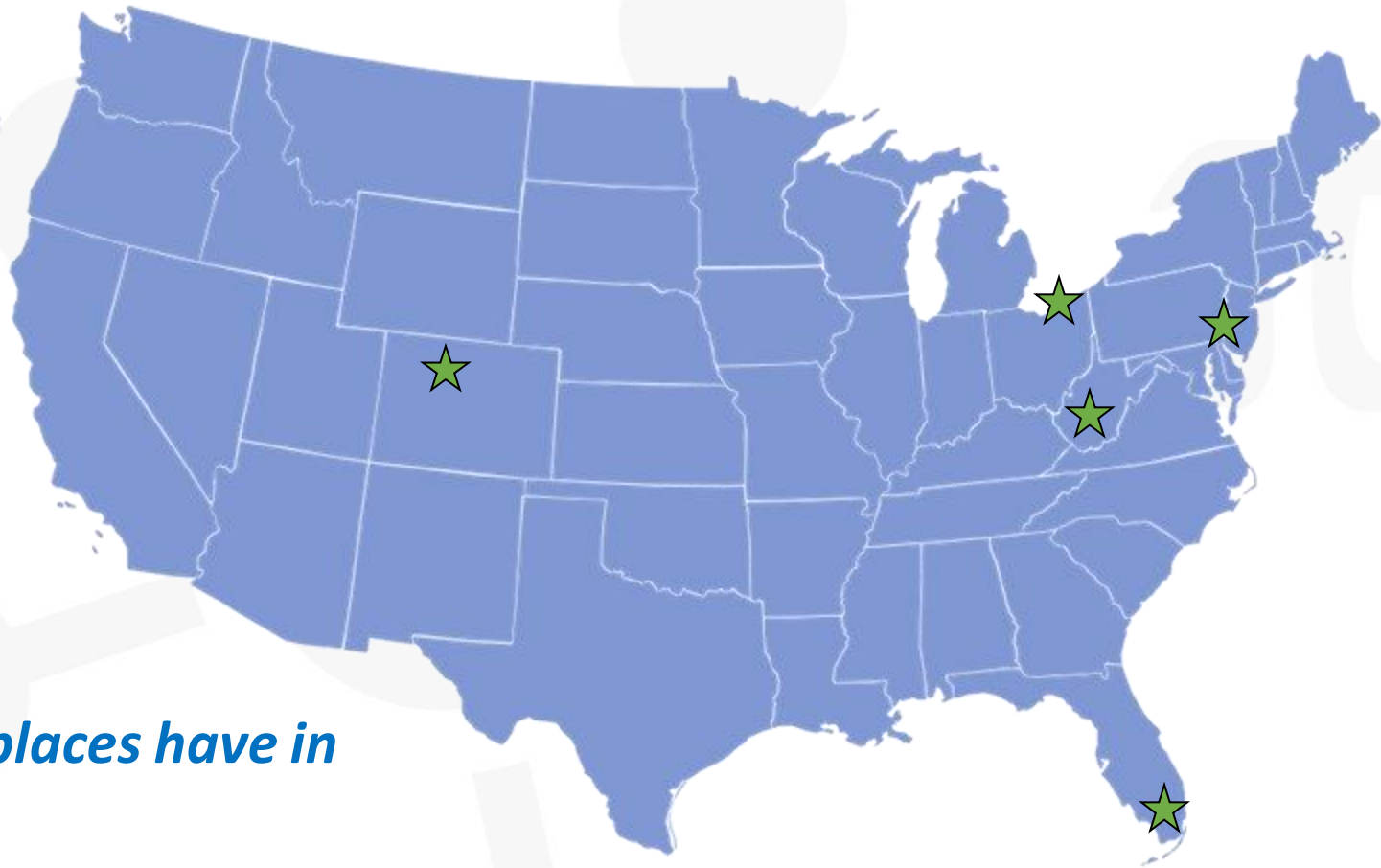




Project BUILD



- Anchorage, AK
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What do these places have in common?

They Use Engineering to Solve Real-World Problems!

They build bridges to connect communities



They clean up pollution



They promote sustainability



They deal with natural disasters

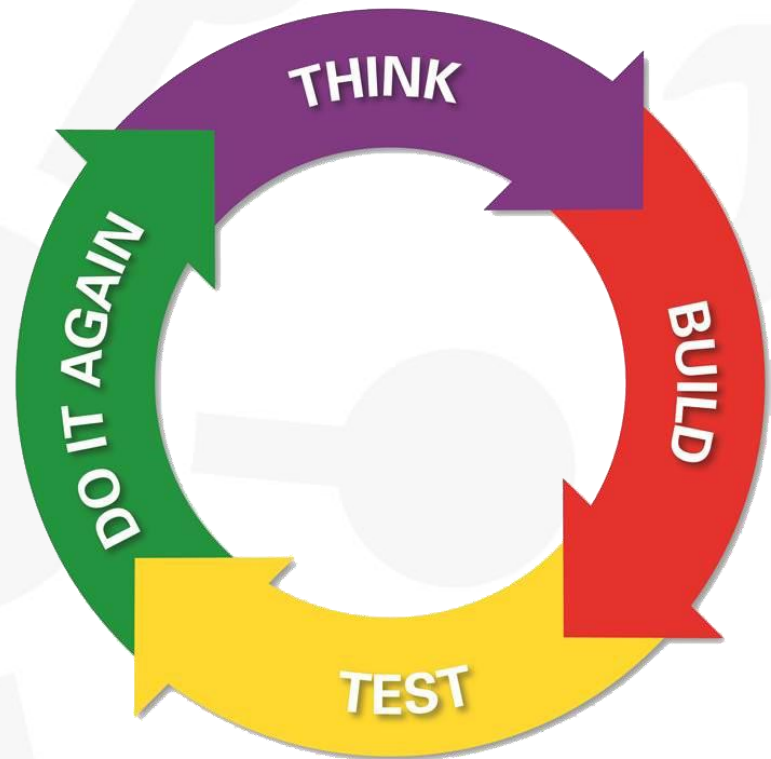


Promotional Materials

Program Icon



Engineering Design Process





Span-tastic Bridges



Designed to Survive



Clean Up Our World



Power from Nature

www.clearinghouse.starnetlibraries.org









The logo for the American Society of Civil Engineers (ASCE) features the acronym "ASCE" in a large, bold, blue sans-serif font. The letter "A" is stylized with three horizontal white lines of varying lengths passing through its center, representing a bridge or a stylized wave. The letters "S", "C", and "E" are solid blue. The background is white with faint, light gray abstract shapes, including a large "A" on the left and a "C" on the right, and several circles and a vertical line at the bottom.

AMERICAN SOCIETY OF CIVIL ENGINEERS



Civil engineers design, build, and maintain the foundation for our modern society – our roads and bridges, drinking water and energy systems, sea ports and airports, and the infrastructure for a cleaner environment

ASCE AMERICAN SOCIETY[®]
OF CIVIL ENGINEERS

Jeannine Finton, Sr. Manager, Pre-College Outreach



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LEAP: Science is Fun!



Get the Engineers Involved!





Dream Big materials and Project BUILD

Activities and Lesson Plans



Strongest Shapes

Using index cards and only one shape in a bridge that can support a toy car.



Slender Tower Challenge

Build the tallest tower you can with the supplies possible.



Design a Dome

Design a 12-inch domed structure strong enough to hold pennies.

Videos: Behind the Scenes



Meet the Women Engineers of Dream Big



Angelica Hernandez (Spanish)



Kids React to Dream Big

Videos: Educational Webisodes



Holding Sway: Wind Engineering



Virtual Modeling: Engineering the Future



Who's in the Driver's Seat: Autonomous Vehicles

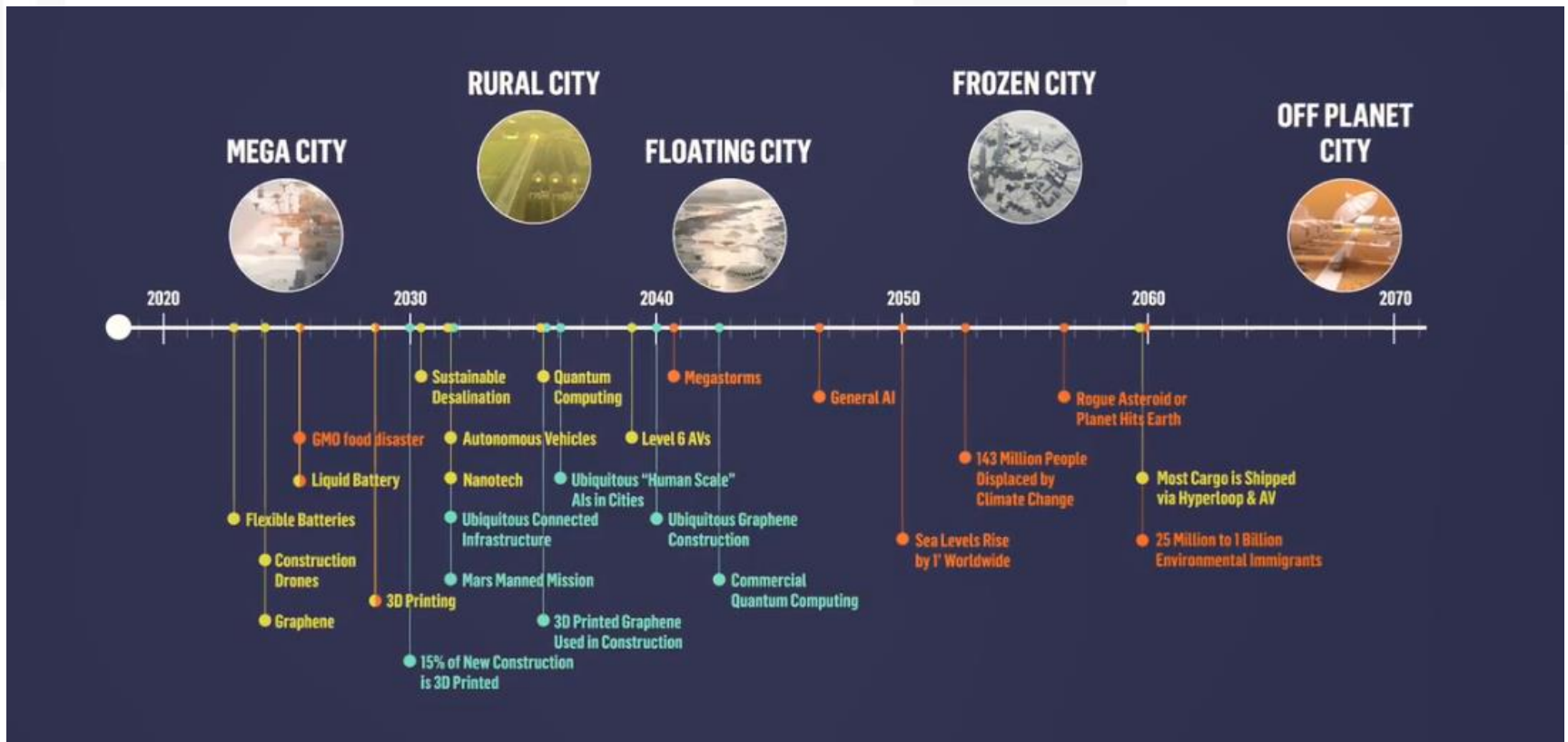
www.discovere.org/dreambig



Summer Reading Themes

- 2019 A Universe of Stories (space)
 - Building in Space or on other planets
- 2020 Imagine Your Story (fairy tales / mythology / fantasy)
 - Castles / Building a castle to withstand attack
 - Minecraft
 - ASCE's Future World Vision (<https://www.futureworldvision.org/>)
- 2021 Tails and Tales (animals)
 - Environmental and Water Engineering
 - Animal houses
 - Design a zoo

Future World Vision





Finding Engineers

- Reach out to ASCE: outreach@asce.org
- Local industries: HR Department
- Universities: Engineering Departments, Student Chapters
- IEEE, ASME, ASABE, SWE, NSBE, SHPE, AISES

Hands-On Activity: Who Dirtied the Water: A Role-Playing Activity

Credit: U.S. National Archives and Records Administration



Who Dirtied the Water?

OVERVIEW:

This interactive story asks students to take on the roles of different historical and modern characters who have had a role in the pollution of Boston Harbor. As a story is read, each character in turn adds a film container full of pollutants to a jar of clean water representing the Harbor. The story may be modified to fit any local, polluted body of water.

- This activity is meant to engage and set a stage!
- “Storytime” Activity = Literacy Connection
- Local Connection

Who Dirtied the Water?

Section 1: Pre-History

(Chorus)

Section 2: First Settlers

(Chorus)

Section 3: European Settlers

(Chorus)

Section 4: Town Grows to a City

(Chorus)

Section 5: Modern Day

(Chorus)

Chorus:

Would you want to
swim in this bay?

Would you eat fish
caught in this water?

Would you like to go
boating on this bay?

“Pollutant” Ideas

RIVERS = Sand

SALT MARSHES = Dry Grass

SHELLFISH = Crushed sea shells

SETTLERS = Organic garbage

FARMERS = Potting soil

HOUSES = Toilet paper

FISHERMEN = Nylon line

BOATERS = Plastic pieces

LAUNDROMATS = Dish detergent

CLEANING = Baking soda

SUN BATHERS = Paper & plastic & popped balloons

FACTORIES = Vinegar

PORT = Vegetable oil (mix vegetable oil with powdered black tempura paint)

Hands-On Activity: Low- Tech Water Filter for High- Impact Clean



Some people in Bangladesh use cloth to clean their water...



Credit: National
Science Foundation

...to take out small creatures in the water
that help spread disease



Credit: National Science Foundation

Susannah Hamm (Cuyahoga
County Public Library)

Justine Rose (AECOM)

Share-Outs from the
Library/Engineer Duo



Tips for Partnering Librarians and Engineers

Justine Rose
Civil Engineer, AECOM

Susannah Hamm
Librarian – Cuyahoga County Public Library

Define Your Roles

- Engineers are partners, not performers or teachers.
- Librarians control the room and maintain order.
- Everyone should join in, participate and encourage kids.



Planning the Program

- Agree on goals.
- Keep it hands-on and active.
- Try each activity before you present it.
- Decide who will lead each part.

- More facilitators/volunteers are better.
- Afterwards, talk about how it went and how to improve.



Presenting the Program

- Focus on the experience, not the product.
- Praise thinking, persistence and creativity.
- Don't take over or give the answer.
- Use open-ended questions.

- Be flexible about group sizes, agenda, etc.
- Be open to good stuff happening in the room.



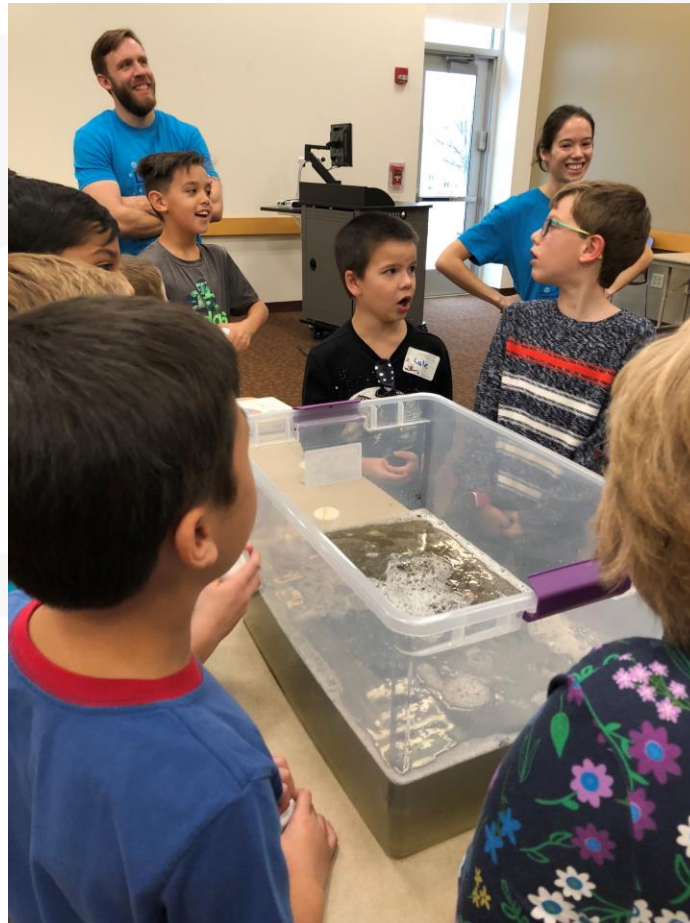
Tips for Librarians

- Go over programming basics with your partners.
- Make clear any library policies about working with kids, safety, or photo/media use.
- Contribute ideas about what may excite kids and engage them in learning.
- You don't have to know everything. Work with the kids to figure it out.

Tips for Engineers

- A public program is less structured than a class or lecture.
- Challenge kids to figure it out. Don't demonstrate or give them the answer.
- Encourage them to keep trying and redesigning.
- Talk about your work.
- Connect the activities to the kids' experiences.

Have fun!





Thank you!

Any Questions?