# Hands-on Fun with STAR Net!

**November 8, 2017**

**Presenters: Brooks Mitchell and Keliann LaConte**

**The webinar will begin at 1:00 p.m. (MT) and will be recorded.**

**While you're waiting:**

1) Introduce yourself in the chat box (Library and City/State)
2) Answer our poll question
3) Test your audio by clicking on "Meeting" and then "Audio Setup Wizard". You will not need a mic for this webinar.

**Audio problems?** Click and highlight the  button at the top of your screen. You can also click "Meeting" > "Audio Setup Wizard". You will not need microphone capabilities.

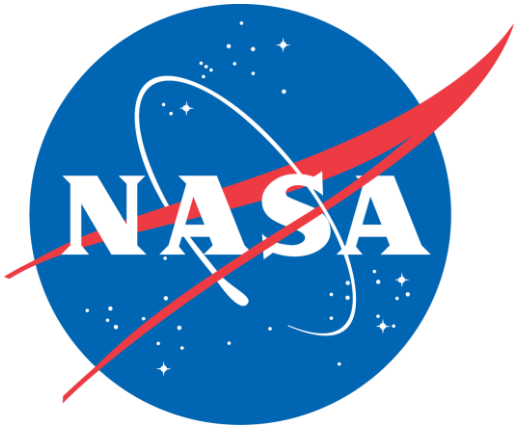
# Today's Agenda

- STAR Net Resources
- Activity: Team Machine
- Activity: Rocket Car Distance Challenge
- Activity: Who Dirtied the Water?
- Activity: Low Tech Water Filter
- Activity: Wind Turbine Tech Challenge
- Q&A

NASA@ My Library

STAR net
Science-Technology Activities & Resources For Libraries

# Thanks to Our Partners

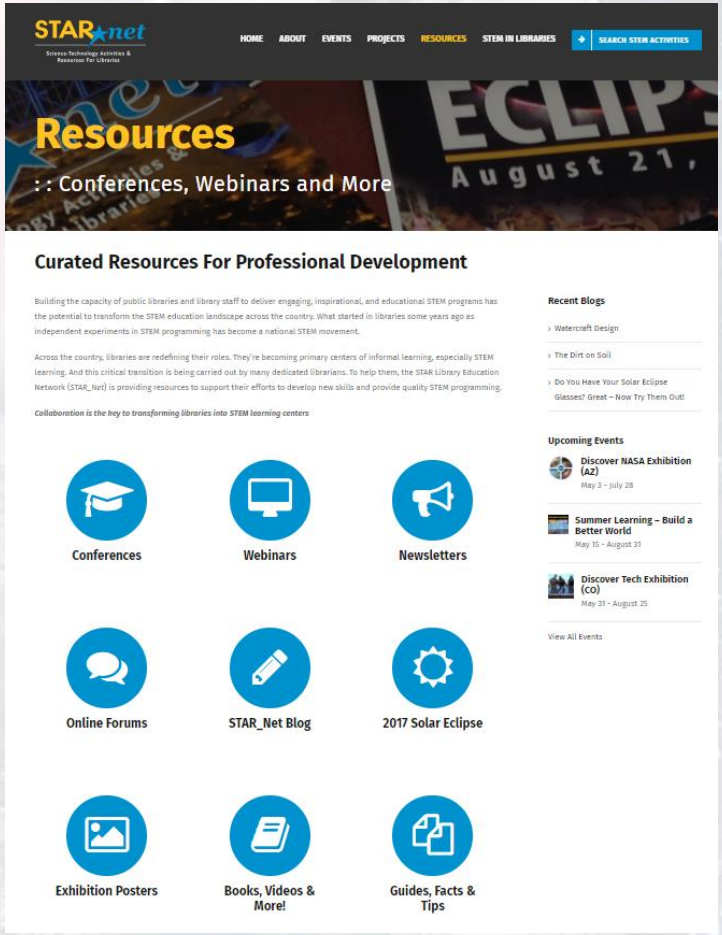

GORDON AND BETTY MOORE FOUNDATION

Google

STAR net
Science-Technology Activities & Resources For Libraries

SPACE SCIENCE INSTITUTE
NCIL
National Center for Interactive Learning

# Join STAR Net!




Professional development resources, including webinars, newsletters, blogs, forums, videos, and much more!

www.starnetlibraries.org

NSF
Institute of Museum and Library Services
ALA American Library Association
Lunar and Planetary Institute
Afterschool Alliance

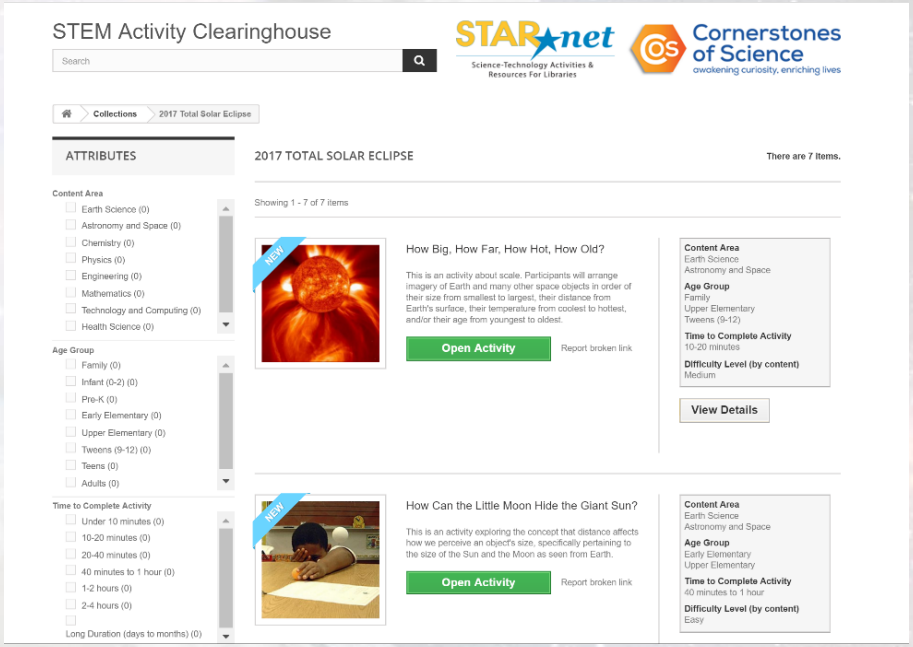
# Upcoming Webinars

- Webinars are announced and archived at: http://www.starnetlibraries.org/resources/webinars/
- November 15th at 1:00 p.m. (MT) – Social Media Tips from NASA
- December 13th at 1:00 p.m. (MT) – STEM Events for Your Library's 2018 Programming

STAR net
Science-Technology Activities & Resources For Libraries

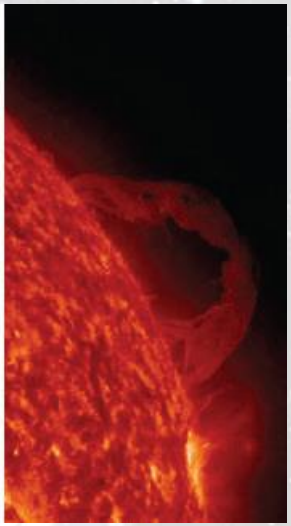
NCIL
National Center for Interactive Learning

# STEM ACTIVITY Clearinghouse




For example:

DIY Sun Cookies

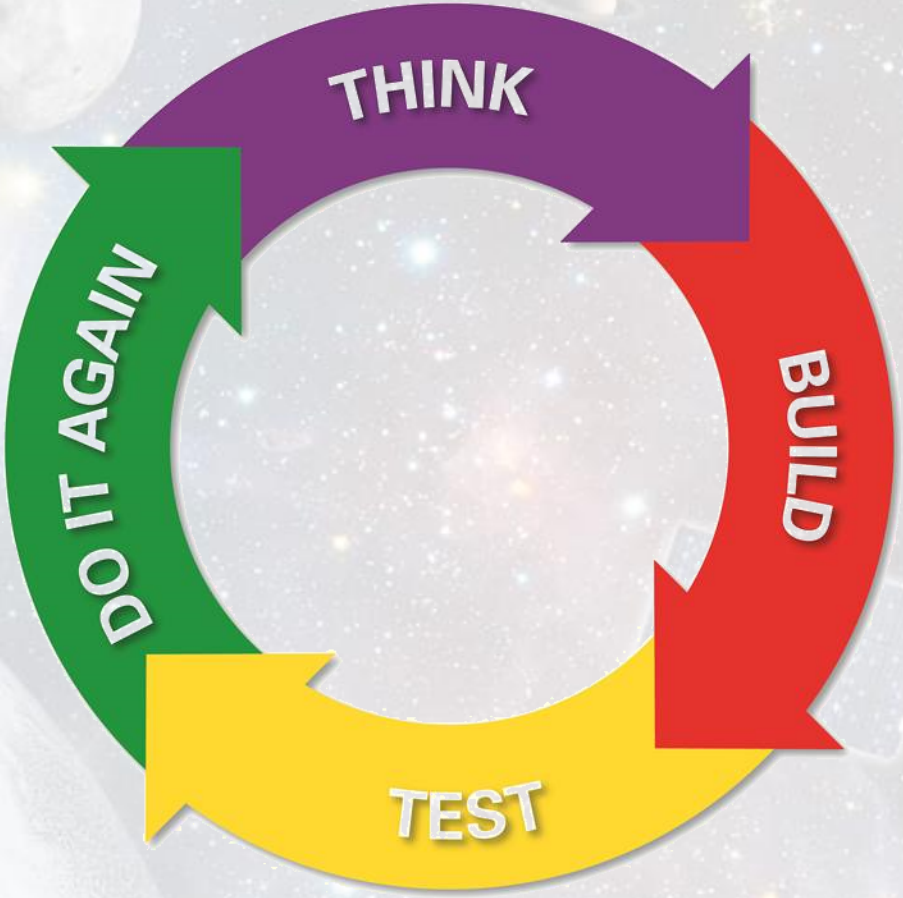


Like an activity and think other library staff should know how great it is? Didn't like an activity or have modifications to make it better? **Make sure to leave a review!**

www.starnetlibraries.org

NSF · Institute of Museum and Library Services · ALA American Library Association · Lunar and Planetary Institute · Afterschool Alliance

# Be Creative…Be an Engineer!



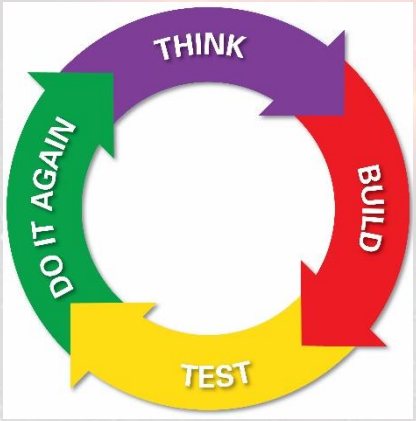
# Team Machine

# Establish a pattern

1. Form a circle.
2. Say your name.
3. Toss the beanbag to someone *across* from you (not next to you). Remember that person's name.
4. Keep going until each person has caught the beanbag.

## Keep the same order as you try to go even faster!

# The faster, the better!




## THINK

- How can you decrease your time?

## BUILD, TEST, and DO IT AGAIN!

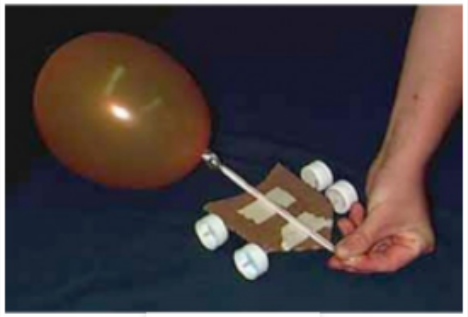
1. Pass the beanbag around the circle again — as quickly as possible!
2. Say the name of the person who will catch the beanbag each time you pass it.
3. Try to "beat" your shortest recorded time

**Hints:**

You may move around. You may stand or sit.

# Rocket Car Distance Challenge





View larger

## Rocket Car Distance Challenge

Using new and recycled materials, patrons construct rocket cars that use a balloon and straw "rocket" to move. Students will "race" the cars to see which can go the farthest before revising their design and "racing" again.

**Open Activity**

**How-to Video**

**Hints for use in your library:** While this activity was developed with libraries in mind, if the suggested "ingredient" list is too daunting, consider doing this activity with just straws, balloons and toy cars before making this a "Maker" activity.

Tweet | Share | Google+ | Pinterest

Write a review

Send to a friend

Print

**Content Area**
Astronomy and Space
Engineering

**Age Group**
Early Elementary
Upper Elementary
Tweens (9-12)
Teens

**Time to Complete Activity**
1-2 hours

**Time needed to prep Activity**
40 minutes to 1 hour

**Cost associated with Activity Materials**
$1-$5

**Difficulty Level (by content)**
Medium

**Mess Level**
Medium

Report a broken link

Categorized Incorrectly? Let us know!

# Rocket Car Distance Challenge

- Cars can take almost any shape! BUT, they will need:
  - A Chassis/Body
  - Axles
  - Wheels
  - An “Engine” (Balloon attached to straw)

- How far can your car travel?

## Wheels

Plastic bottle caps, various sizes

Circular packing foam

CDs or DVDs

Jar lids, various sizes

Plastic container lids (like those for oatmeal, baking powder, yogurt etc.)

Large wooden beads

## Axles:

Round plastic stir sticks (sip stirrers)

Wooden skewers

Wooden dowels (pre-cut)

Pencils

## Body/Chassis

Styrofoam plates (heavy duty)

Rectangular scraps of cardboard

Shoe boxes

Small boxes

Paper towel tubes

Foam core board

Stiff paperboard

Plastic food storage containers

Berry baskets

Egg cartons

Empty plastic bottles, various sizes

Foam packing material

# Who Dirtied the Water?

STAR net
Science-Technology Activities & Resources For Libraries

In partnership with Cornerstones of Science
awakening curiosity, enriching lives

STEM ACTIVITY Clearinghouse

Search

Collections > Clean Up Our World > Who Dirtied the Water: A Role Playing Activity


## Who Dirtied the Water: A Role Playing Activity

Participants take turns adding pollutants to a gallon jar of water (which symbolizes a local body of water) as the facilitator reads a story about water pollution.

**Open Activity**

Report broken link

**Hints for use in your library:** The story within this activity guide focuses on the Metro Boston Region and the Boston Harbor; however, the story can be easily modified to focus on a body of water near you.

Tweet | Share | Google+ | Pinterest

Write a review

**Content Area**
Earth Science

**Age Group**
Family
Pre-K
Early Elementary
Upper Elementary

**Time to Complete Activity**
20-40 minutes

**Time needed to prep Activity**
5-10 minutes

**Cost associated with Activity Materials**
$5-$10

**Difficulty Level (by content)**
Easy

**Mess Level**
Medium

# 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)

# Low-Tech Water Filter for High-impact Clean




## Low-Tech Water Filter for High-Impact Clean

Participants consider the water features they might enjoy at a community park — a pond, brook, water playground (or "sprayground"), or pool, — and what happens to the water over time.

Open Activity

Report broken link

How-to Video

Implementation Guide

Teacher's Guide

Tweet | Share | Google+ | Pinterest

**Content Area**
Earth Science
Engineering
Health Science

**Age Group**
Family
Upper Elementary
Tweens (9-12)
Teens

**Time to Complete Activity**
20-40 minutes

**Time needed to prep Activity**
20-40 minutes

**Difficulty Level (by content)**
Easy

**Mess Level**
Medium

# Some people in Bangladesh use cloth to clean their water…

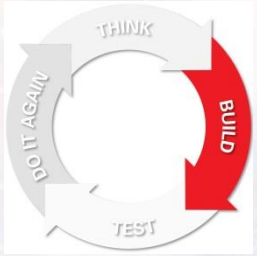
Credit: National Science Foundation

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



Credit: National Science Foundation

# Low Tech Water Filter






- **Activity**:
  - Use common materials to design a water filtration device to supply the park / water feature with clean water
  - 15 to 30 minutes; longer for children who like to experiment
  - Plastic water/soda bottles, variety of filtration materials, access to water
  - Can get a little messy!
  - <u>Don’t drink the water!</u>

# Low Tech Water Filter


- Think:
  - What materials will work best to clean the water?
  - Which will work best for twigs and leaves?
  - Finer sediment?
  - Pesticides?

# Low Tech Water Filter


- **Procedure**:
  - Build a water filter
  - Test:
    - 1 material at a time
    - What happened?
  - Do It Again: Think about what you observed, test another material and repeat the process

# Low Tech Water Filter

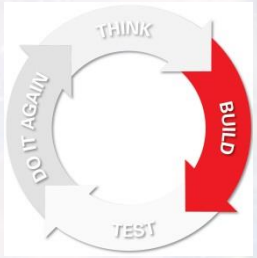

- Next, think about what *combination of materials* – in *what order* – will provide the best filter
- Build
- Test

# Low Tech Water Filter


- Compare!
- Which combination and in what order worked best?
- Can you get the water cleaner?
- Can you filter the water faster?
- Do It Again!

# Wind Turbine Tech Challenge

# Playful Building: Wind Turbine





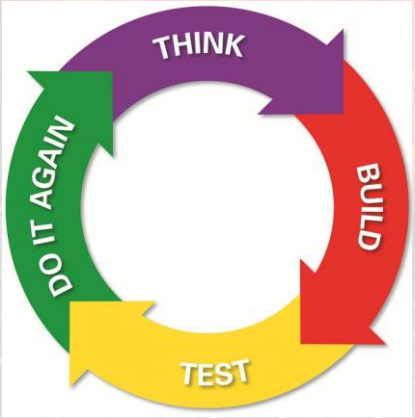

- **Activity**:
  - Use common materials to design a wind turbine to supply the park with electricity
  - 15 to 30 minutes; longer for children who like to experiment
  - Soda straws, Post-It note pads, play-doh, toothpicks

# BUILD and TEST

1. Push the four toothpicks into the putty so that they stand upright. Keep them close together.
2. Put a small scrap of paper at the bottom of the toothpicks. This will keep the straw from sticking!

3. Stick the Post-it notes to one end of the straw. Make sure they don't cover each other!
4. Slide the straw over the toothpicks.
5. Use a second straw to gently blow across the blades.

# Make it even better!




## DO IT AGAIN!

Modify your design — but change only one thing at a time!

## THINK, BUILD, and TEST

- Which different material could you try using?
- What else can you try changing?
  - The angle of the blades?
  - The size of the blades?
  - The shape of the blades?
  - Could the blades be more curved (cupped)? Less curved?

# Discussion

Which one of these activities are you most likely to facilitate in your library?

# Thank you!

*STAR_Net*
www.starnetlibraries.org
www.facebook.com/STARLibraries
twitter.com/STARNet_Project