Out-of-this-World Engineering

September 26, 2018

Presenters: Brooks Mitchell and Keliann LaConte

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

While you're waiting:

1) Introduce yourself in the chat box
2) Click audio "Join by Computer" – you won't have microphone access
3) On the bottom toolbar, click on "Chat" and "Q&A"

Today's Agenda

- Introduction and Reminders
- Hands-on Activity #1: "Soda Straw Rockets"
- Hands-on Activity #2: "Mars Engineering"
- Hands-on Activity #3: "Eggstronaut Drop"
- Q&A

Poll Question

- Introduction and Reminders
- Hands-on Activity: "Crater Creations"
- Vivian White (Astronomical Society of the Pacific)
- A Quick Look at Lunar Trek
- Q&A

NASA@ My Library

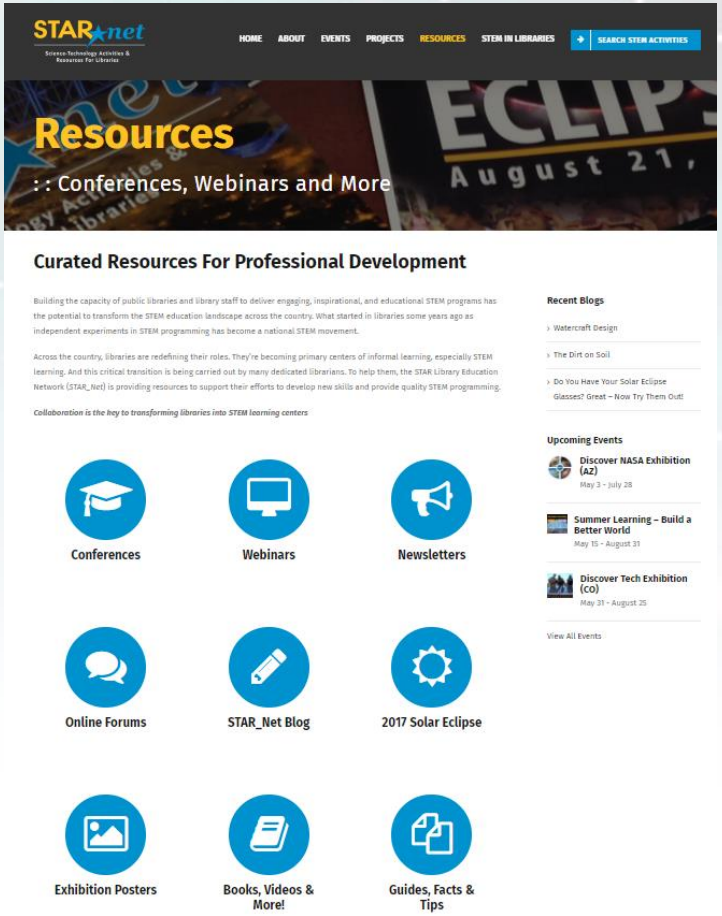
A National Earth and Space Science Initiative that Connects NASA, Public Libraries and their Communities

SPACE SCIENCE institute

NCIL National Center for Interactive Learning

Join STAR Net!

www.starnetlibraries.org



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

NASA ALA American Library Association Cornerstones of Science PACIFIC SCIENCE CENTER EDC Learning transforms lives.

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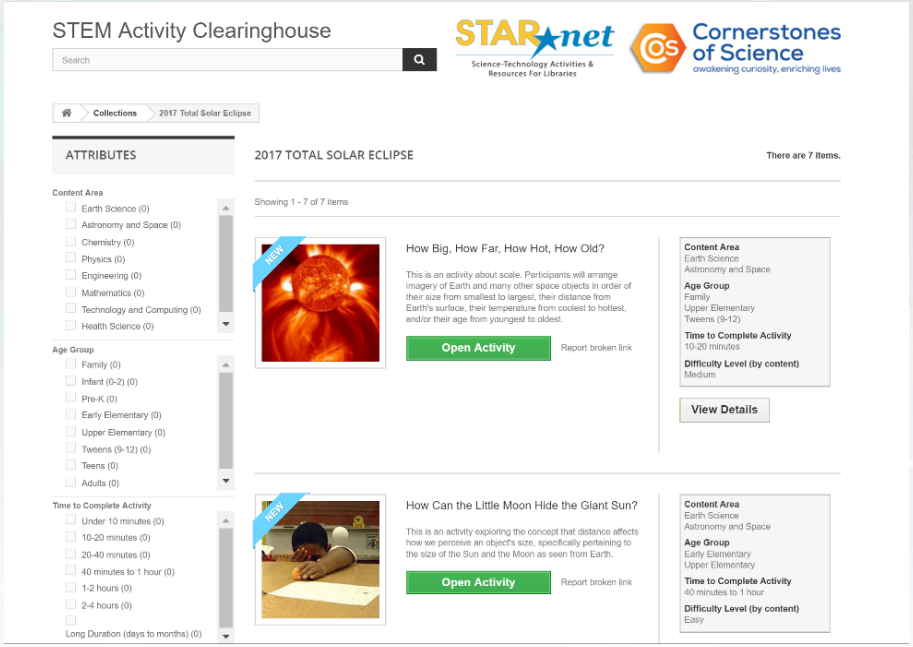
NCIL National Center for Interactive Learning

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!**

NASA ALA American Library Association Cornerstones of Science Pacific Science Center EDC Learning transforms lives.

Upcoming Conferences

www.starnetlibraries.org/resources/conferences

- **Association of Science and Tech Centers (ASTC)**
  - 9/29 – 10/2
- **New Mexico Library Association Conference Pre-Conference**
  - 10/31
- **Young Adult Library Services Association (YALSA)**
  - 11/2 – 11/4

Night Sky Network

Find a club:
https://nightsky.jpl.nasa.gov/clubs-and-events.cfm

Solar System Ambassadors

- NASA Milestones
- Speakers
- Hands-on Activities
- Celestial Viewing
- Your suggestions…

https://solarsystem1.jpl.nasa.gov/ssa/home.cfm


ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS
Contact ASCE at outreach@asce.org

FREE STAR Net Resources

(take a picture of this slide!!)

175+ Activities Specifically for #STEMINLIB
http://clearinghouse.starnetlibraries.org/

Upcoming and Archived Professional Development Webinars
https://www.starnetlibraries.org/resources/webinars/

Monthly Newsletter
https://www.starnetlibraries.org/resources/newsletters/

Upcoming STEM Events
https://www.starnetlibraries.org/upcoming-events/

STAR Net Blog (for library staff and written by library staff!)
https://www.starnetlibraries.org/blog/

Partnership Resources
https://www.starnetlibraries.org/stem-in-libraries/collaboration/partnership-opportunities/

Community Dialogue Resources
http://www.starnetlibraries.org/resources/community-dialogues/

What's Next?

Universe of Stories

Summer 2019

NASA@ My Library and *STAR Net* are partnering with the Collaborative Summer Library Program to support 16,000 libraries.

Please join us!!

A Universe of Stories – 2019 Summer Reading

- Summer Reading Theme Webinar Series
  - *Universe or Stories Kick-off Webinar: Week of October 22nd*
- Space Science Activities
- Universe of Stories Clearinghouse Collections
- Multimedia Resources
- Professional Development STEM Resources

InOMN – 10/20/18

InOMN Webinar
www.starnetlibraries.org/resources/webinars

Free InOMN Poster
https://moon.nasa.gov/resources/173/international-observe-the-moon-night-poster/

Register your program!

- https://moon.nasa.gov/observe-the-moon/register/

Upcoming InOMN Dates:

- October 20, 2018
- October 5, 2019
- September 26, 2020

Engineers and Space

"Only rocket scientists work at NASA"

Education and Experience Requirements and Basis of Ratings

Basic Education Requirements for All NASA AST Positions:

Successful completion of a standard professional curriculum in an accredited college or university leading to a bachelor's degree with major study in an appropriate field of engineering (not engineering technology), physical science, life science or mathematics is required. The degree must include or be supplemented by course work appropriate to the AST specialty for which application is made; refer to the section, "Appropriate Fields of Study," under each AST specialty. (In some cases a graduate degree in an appropriate field or unconditional acceptance as a candidate for an advanced degree in an appropriate field by an accredited institution may be submitted. For applicants qualifying on the basis of graduate education and/or experience, any of the undergraduate majors shown below is acceptable if the required graduate study and/or professional experience is closely related to this type of work and provides the knowledges, skills and abilities required in the position being filled.)

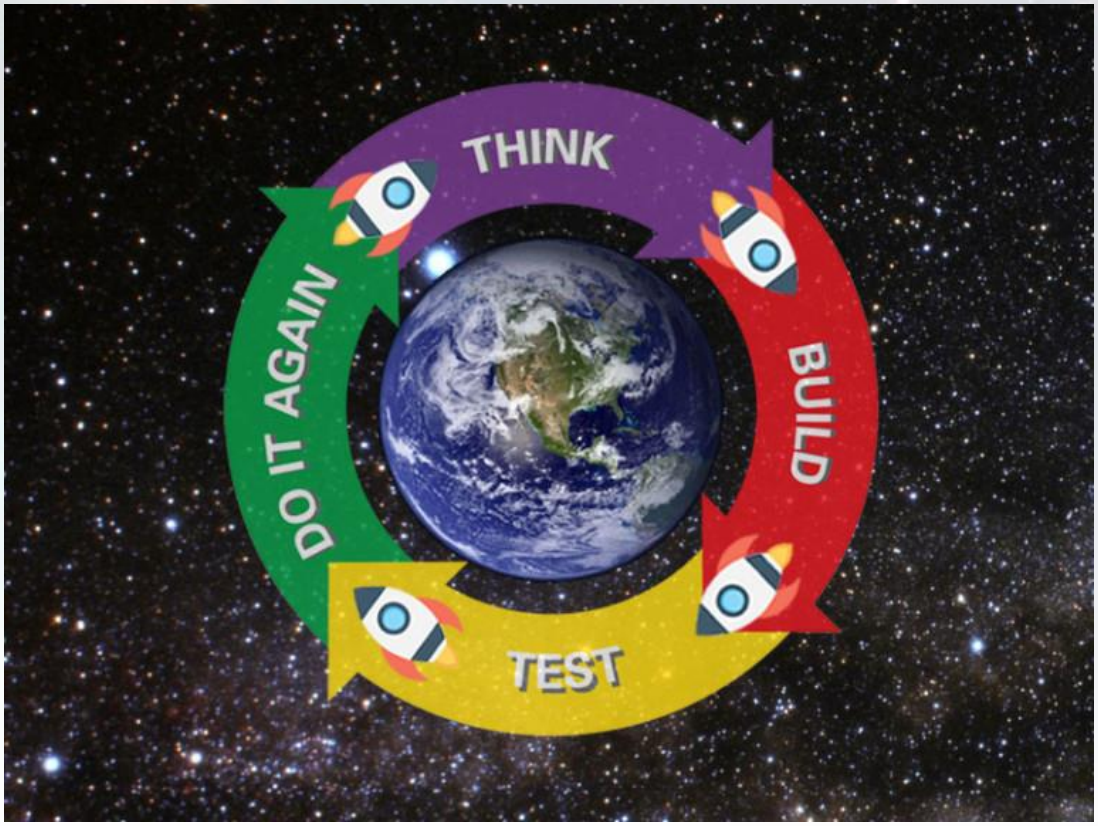
General Listing of Appropriate Academic Fields of Study for Aerospace Technology Positions:

- Aeronautical Engineering
- Aeronautics
- Aerospace Engineering
- Astronautical Engineering
- Astronautics
- Astronomy
- Astrophysics
- Biomedical Engineering
- Ceramic Engineering
- Ceramics
- Chemical Engineering
- Chemistry
- Civil Engineering
- Computer Engineering
- Computer Science*
- Earth and Planetary Science
- Electrical Engineering
- Electronics Engineering
- Geology
- Geophysics
- Industrial Engineering
- Materials Engineering
- Materials Science
- Mathematics, Applied or Pure
- Mechanics, Applied or Engineering
- Mechanical Engineering
- Metallurgical Engineering
- Metallurgy
- Meteorology
- Nuclear Engineering
- Nuclear Engineering Physics
- Oceanography
- Optical Engineering
- Physics
- Physics, Applied or Engineering
- Space Science
- Structural Engineering
- Welding Engineering

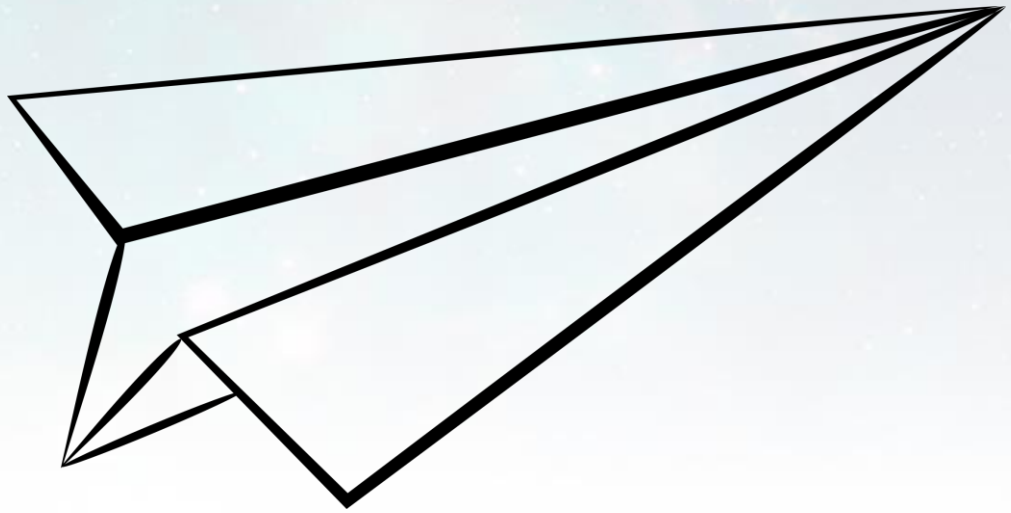
Rubik Sheth – Faces of Space Tech

Engineering Design Process

...in SPACE!



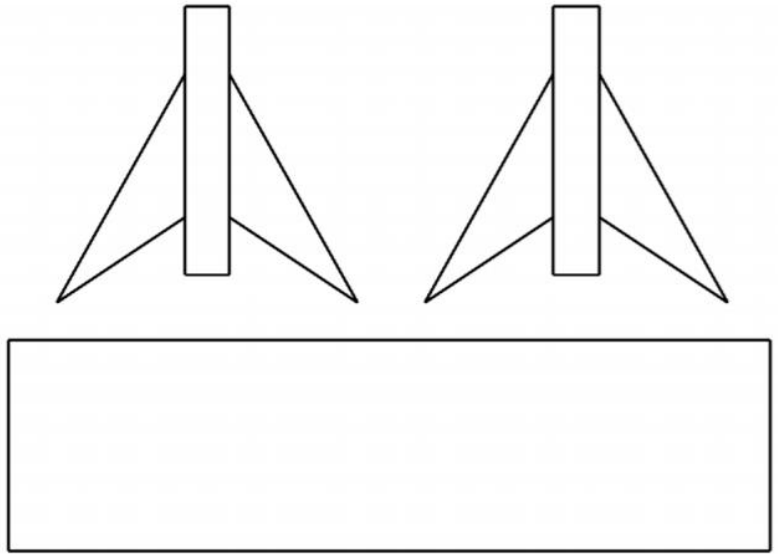
What is a simple engineering activity you can do with just a piece of paper?



Soda Straw Rockets

- **Materials**
  - Rocket template
  - Pencils
  - Scissors
  - Tape
  - Straw

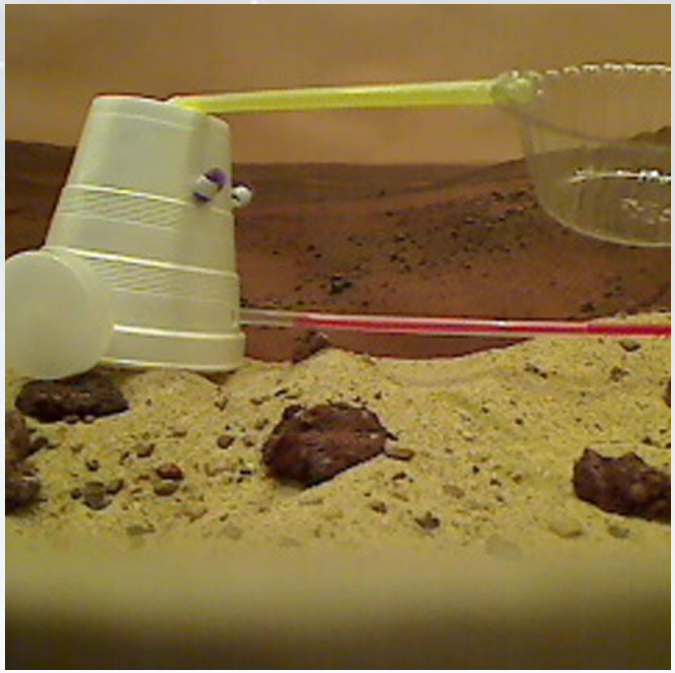
- **Design Challenge**
  - Create a rocket that can be launched from a soda straw
  - Modify the design to see how the changes impact the rocket performance.



Activity description courtesy: John Callas, NASA/JPL

Mars Engineering

Each team's mission is to design and build a rover out of the materials available that can pick up, move, and set a rock down into a (fake) scientific instrument on the rover body, like the Sample Analysis at Mars (SAM) instrument onboard the Curiosity rover.



This test will mimic a function that may be used by a real rover, such as Curiosity, as it explores and tests rock samples.

Mars Engineering Materials

Mandatory: variety of tape, scissors, markers, glue, foil, 3 small rocks

Miscellaneous Craft and Everyday Items: Straws, pencil top erasers, beads of various sizes, foil cupcake holders, screens, wooden miniatures, aluminum foil, plastic wrap (of all colors), old CDs, pipe cleaners, toothpicks, wire, wire cutters, Legos, construction paper (variety of colors, black), tinsel, ribbon, fabric, gauze, wood dowels/skewers, rubber bands, shiny streamers, etc.

For Rover Wheels: Wooden spools, large buttons, bottle caps, plastic cups (sturdy), empty (clean) Play-Doh® containers, old CDs, etc.

For Rover Body: Pint-sized milk containers, coffee cans, soup cans (tape any sharp edges), paper or Styrofoam cups, or other objects for the spacecraft body, empty DVD cases, black plastic or biodegradable seedling (plant) trays, empty egg cartons, cereal boxes, 2-liter soda bottles, different-sized Styrofoam blocks, other empty plastic or cardboard containers/boxes, etc.

Tips for Engaging Girls in STEM

- Encourage a growth mindset.
- Praise children for their effort (not intelligence).
- Encourage children to persist despite obstacles.
- Expose children to successful role models in math and science.
- Provide opportunities for developing spatial skills.

Erik Ordñez, Materials Engineer

Eggstronaut Drop

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Send to a friend

Print

Eggstronaut Drop

In this classic activity, patrons engineer a space capsule that will protect an egg that is dropped from a specific height.

Open Activity

How-to Video

Write a review

Content Area
Astronomy and Space
Engineering

Age Group
Family
Upper Elementary
Tweens (9-12)
Adults

Time to Complete Activity
40 minutes to 1 hour

Time needed to prep Activity
10-20 minutes

Cost associated with Activity Materials
$5-$10

Difficulty Level (by content)
Medium

Mess Level
High

Report a broken link

Categorized Incorrectly? Let us know!

Eggstronaut Drop Materials

- Raw Eggs
- Hard-boiled eggs (or plastic eggs)
- Paper, Pencils, Markers, crayons
- Construction materials, such as: straws, cardboard, packing material, Styrofoam, meat trays, egg cartons, string, rulers, paper towels, garbage bags, cotton, toothpicks, Dixie cups, sandwich bags, ziploc bags, cloth, etc.
- Scissors
- Tape
- Drop Cloth
- Ladder (or balcony)
- Paper Towels
- Weighing scale (optional)