STEM Events for Your Library’s 2018 Programming

December 12, 2017
Presenter: Brooks Mitchell

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.

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Today’s Agenda

• Professional Development Resources
• Engineers Week (Feb. 18-24)
• Earth Day (April 22)
• NASA InSight Mission (May 5 and November 26)
• Parker Solar Probe Launch (July 31)
• Lights on Afterschool (October 25)
• International Observe the Moon Night (October 20)
• Q&A
Thanks to Our Partners
Join STAR Net!

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

• Webinars are announced and archived at: http://www.starnetlibraries.org/resources/webinars/

• Building a Better Program for Engineer’s Week
  • Tuesday, January 9th at 1:00 p.m. (MT)
  • Register Here

• Celebrate 60 Years of Earth Observations with NASA
  • Tuesday, March 6th at 1:00 p.m. (MT)
  • Registration Opens Early February
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!**
Engineers Week
February 18-24, 2018

• Celebrate how engineers make a difference in our world

• Increase public dialogue about the need for engineers

• Bring engineering to life for kids, educators, and parents
Engineers Week Resources

• **Engineers Week** landing page on STAR Net

• Building a Better Program for Engineers Week webinar on Tue., Jan. 9 at 1:00 pm MST
  • [Register here](#)

• STEM Activity Clearinghouse Collections
  • [Span-tastic Bridges](#)
  • [Designed to Survive](#)
  • [Clean Up Our World](#)
  • [Power From Nature](#)

• [DiscoverE resources](#) and [Dream Big](#) Resources
Be Creative...Be an Engineer!
Daylight in a Bottle

Hands-on STEM: Daylight in a Bottle

Looking for a way to “shine a light” on the world of engineering and sustainable energy at your library? Look no further than Daylight in a Bottle.

This activity highlights daylighting, or the act of using natural light to brighten a room - it is simple, easy, fun, and cheap! Make sure to watch the videos in the Related Links section to learn more about how this method is used in other parts of the world. As always, please leave a review and let us know what you think.

Activity Link

Liter of Light Video

Liter of Light Instructional Video (more complex)
Earth Day

Chat Box: What has your library done successfully in the past for Earth Day?
On Jan. 31, 1958, the first U.S. satellite, Explorer 1, was launched. This was the start of extraordinary technological and scientific advances, improving both understanding of our planet and the lives we lead on it.

Celebrate Earth Day 2018 and beyond with NASA resources for exploring your planet and neighborhood, and contributing to NASA science through the GLOBE Observer citizen science app. Resources, and programming ideas will be available to support a wide range of library programs and audiences: children, families, tweens/teens, and adults. Use Earth Day to connect science to your community interests, including the following topics, and many more!
Earth Day Programming
Ideas

- Environmental awareness and stewardship
- Recycling
- Photography
- Gardening, planning or community gardens
- Local/library cleanup
- Nature walks
- Citizen science
- Agriculture
- 60 years of change in my community
- Arts and crafts
- Story hour
- Book clubs and reading lists
- Art and science

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Earth Day Resources

• **NASA Globe Observer** – Citizen Science!!
  • 2017 Webinar Recording

• 2018 Webinar on March 6
  • Registration will open early February

• **2017 Earth Science for a Better World** webinar recording

• Favorite Earth Day activities
  • **Who Dirtied the Water?**
  • **UV Kid**
  • **Low Tech Water Filter**
  • **Exploring Earth: Investigating Clouds**
Neato Magneto

Activity Link

Neato-Magneto Planets

Participants study magnetic fields at four separate stations: examining magnetic fields generated by everyday items, mapping out a magnetic field using a compass, creating models of Earth's and Jupiter's magnetic fields, and observing auroras produced by magnetic fields on both planets.

Open Activity

How-to Video

Hints for use in your library: Have the children use caution when experimenting with magnets. They should not be brought near computers, computer monitors, audio tapes, or other magnetic devices.

Content Area
Earth Science

Age Group
Family

Family

Time to Complete Activity
10-20 minutes
40 minutes to 1 hour

Time needed to prep Activity
10-20 minutes

Cost associated with Activity Materials
31-35

Difficulty Level (by content)
Medium

Moss Level
Medium

MORE INFO

Participants study magnetic fields at four separate stations: examining magnetic fields generated by everyday items, mapping out a magnetic field using a compass, creating models of Earth's and Jupiter's magnetic fields, and observing auroras produced by magnetic fields on both planets.
Mars InSight Launch and Landing

• NASA Discovery Program mission that will place a single geophysical lander on Mars to study its deep interior

• Understanding the interior of Mars and the processes that shaped the rocky planets/inner solar system over four billion years ago

• Using sophisticated geophysical instruments

• Launches on May 5 and lands November 26
InSight Mission Overview

Launch opportunity opens — May 5, 2018
Landing — November 26, 2018
Surface operations — 728 days / 708 sols
Instrument deployment — About 60 sols (including 20 sols margin)
Data volume over 1 Martian year — More than 29 GB (processed seismic data posted to the Web in 2 weeks; remaining science data less than 3 months, no proprietary period)
Mars InSight Resources

• STAR Net InSight Landing Page
• NASA InSight Home Page
• Off to Mars! Programming Ideas for the InSight Launch webinar on March 13th
  • Registration will open in mid February
Mars InSight Activities

- Search for Life
- Recipe for a Planet (Mars Edition)
- Dunking the Planets
- Mars Match Game
- Build a Space Colony
Strange New Planet

In this simulation of space exploration, participants plan and carry out five missions to a 'planet' and communicate their discoveries to their family or a friend.

Open Activity

Teacher's Guide

Rating ★★★★★
Participants Enjoyed the Activity ★★★★☆
Participants Learned from This Activity ★★★★☆
Activity Instructions Were Clear and Easy to Follow ★★★★★
Would Recommend ★★★★★

Content Area
Astronomy and Space

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

Time to Complete Activity
40 minutes to 1 hour

Time needed to prep Activity
20-40 minutes

Cost associated with Activity Materials
$10-$20

Report a broken link
Categorized Incorrectly? Let us know!
Telescope View from Space
Space Probe

Credit: NASA/Johns Hopkins University Applied Physics Laboratory/Southwest Research Institute
Orbiter: Cassini at Saturn
Lander: Curiosity Rover on Mars
Parker Solar Probe

• NASA mission to “Touch the Sun”
• Launch window starts July 31, 2018
• Coming within four million miles of the Sun
  • Seven times closer than ever before
• Experiencing temperatures reaching 2,500 Fahrenheit

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Mission Trajectory

First Perihelion at 35.7 Rₚ
Nov 1, 2018

First Min Perihelion at 9.86 Rₚ
Dec 19, 2024

Launch
July 31, 2018

Venus Flyby #1
Sept 28, 2018
Parker Solar Probe Resources

- Parker Solar Probe Landing Page

- Repurpose your 2017 Eclipse ideas!
  - (2017 Solar Eclipse Clearinghouse Collection)

- Solar Vision app

- NASA Parker Homepage
How Big? How Far? How Hot?

Sorting Games: How Big? How Far? How Hot?

This NASA@ My Library Activity Guide will help library staff facilitate these sorting activities in large or small groups, with patrons from Pre-K to adult.

Open Activity

Content Area
Astronomy and Space

Age Group
Family
Pre-K
Early Elementary
Upper Elementary
Tweens (9-12)
Teens
Adults

Time to Complete Activity
10-20 minutes

Time needed to prep Activity
Under 5 minutes

Difficulty Level (by content)
Medium

Mess Level
Low

Write a review

Send to a friend

Print

Report a broken link

Categorized Incorrectly? Let us know!
Sorting Game Cards - How Hot?

1. Comet
2. Volcanic Lava
3. Meteor
4. Sunspot
5. Surface of the Sun
6. Earth's Core
7. Lightning
8. The Sun's Corona
9. The Sun's Core
This is the card deck with the sunspot on top (marked with red dots on the back).

Ask participants to grab a card (or a few if you have a small group) and line up in the correct order for the objects (from coldest to hottest).

The suggested “correct” order is: Comet’s surface (171 °F; 77 °C), Lava (1,832 °F; 1,000 °C), Meteor (3,100 °F; 1,700 °C), Sunspot (6,332 °F; 3,500 °C), Sun’s Surface (9,932 °F; 5,500 °C), Earth’s Core (10,832 °F; 6,000 °C), Lightning Bolt (52,232 °F; 29,000 °C), Sun’s Corona (3.6 million °F; 2 million °C), Sun’s Core (27 million °F; 15 million °C).

Remember though, there is a large variance in temperatures, and the discussion is more important than the right answers (see images at the end of this guide).

If participants are getting stuck, consider providing the following hints (remember, you’re a “guide on the side” – you don’t need to provide correct answers, just start a discussion!):

- Comets absorb and reflect solar light, they don’t have any light (or heat) source of their own.
- Sunspots are cooler than the rest of the Sun’s surface.
- Lava can melt metal, but dissipates heat so quickly it can flow through tubes without remelting them.
- The Earth’s core is actually hotter than the Sun’s surface!
- Lightning bolts can be up to 5x hotter than the surface of the Sun!

Frequently Asked Questions:
- How hot is lava?
  Up to 2,000 °F, depending on its speed and composition
- Is the Sun’s atmosphere (corona) the coolest part of the Sun?
  No! It’s actually one of the hotter parts, hotter than the surface and sunspots. The reason is still a mystery, but it may have something to do with the Sun’s changing magnetic fields.
Scale Model of Sun and Earth

How to Video Link: https://www.youtube.com/watch?v=r-TdpeSZStg
Lights on Afterschool

• October 25, 2018

• Presented by the Afterschool Alliance along with numerous partners

• STAR Net Webinar Recording Link

• 2018 Webinar will occur in early August

• Afterschool Alliance report on how libraries and afterschool providers work together
Survey Highlights

- 365 afterschool providers
- 98% believed there are benefits to partnering with public libraries
- 74% have worked with a public library before

Ages of students served:

- Pre-K: 22%
- Elementary school: 91%
- Middle school: 64%
- High school: 36%
What are afterschool programs and libraries doing together?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer reading or summer learning initiative</td>
<td>65%</td>
</tr>
<tr>
<td>Library visit (e.g. to check out books, use computers, see an exhibit, etc.)</td>
<td>58%</td>
</tr>
<tr>
<td>Special events (such as a family night, Maker Faire, or other themed event)</td>
<td>48%</td>
</tr>
<tr>
<td>Librarian outreach</td>
<td>43%</td>
</tr>
<tr>
<td>Visited library for an education program</td>
<td>41%</td>
</tr>
<tr>
<td>Science, technology, engineering or math (STEM) education</td>
<td>29%</td>
</tr>
<tr>
<td>Book share or donation.</td>
<td>25%</td>
</tr>
<tr>
<td>Curriculum development or support (any topic)</td>
<td>18%</td>
</tr>
<tr>
<td>Professional development (library staff training afterschool educators)</td>
<td>11%</td>
</tr>
<tr>
<td>Other</td>
<td>5%</td>
</tr>
</tbody>
</table>

STEM Partnerships

- Of those who’ve worked with a public library before, only 29% have done STEM.
- Of those who hadn’t worked with a public library, 63% had not considered a partnership in STEM.

"I wasn’t aware libraries had STEM. I thought of them more as a literacy resource."

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International Observe the Moon Night

• Will occur on October 20, 2018
• Official InOMN Website
• 2017 Webinar Recording
  • 2018 STAR Net Webinar will occur in mid-August
• STEM Activity Clearinghouse Moon Collection
• NASA Moon Trek Website
Moon Trek

• Analysis tools
  • Lighting, Slope, Hazard, Profile, Sun angle
• Browse, search and download of data products
• Visualization (with overlays)
• Collaboration (bookmark)
• 3D print and terrain view
• Data
  • LRO, Apollo, LP, GRAIL, Clementine, Chandrayaan-1, Kaguya
  • Gravity models, Imagery, DEMs, Hazards, Resources
• Users
  • Missions, Lunar scientists, EPO
3D Print Generation
Thank you!

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