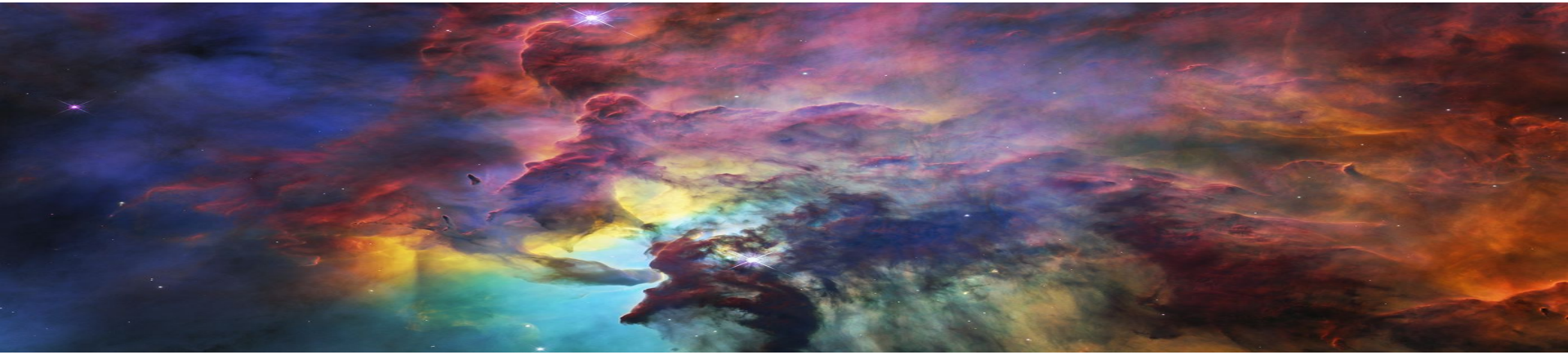

NASA @ My Library
2019 Summer Reading Program
Montana State Library
Museum of the Rockies
Webinar: Wednesday, February 13, 2019



PRESENTED BY

Amelea Kim
Montana State Library

Jaime Augst
Museum of the Rockies

MONTANA State Library

MUSEUM OF THE ROCKIES
MONTANA STATE UNIVERSITY

TODAY'S GOALS

To learn about:

- MSL & MOR collaboration
- 2019 Summer Reading: *A Universe of Stories*
- What is NASA @ My Library
- Using the NASA STEM Facilitation Kit
- Applying to receive a kit for your library
- How to locate additional resources

MONTANA State Library

MUSEUM OF THE ROCKIES
MONTANA STATE UNIVERSITY

MUSEUM OF THE ROCKIES

- A college-level division of Montana State University and an independent 501(c)(3)nonprofit institution.
- A Smithsonian Affiliate and accredited by the American Association of Museums
- Most visited museum in the state
- Serves over 15,000 schoolchildren annually on field trips
- Provides outreach materials in paleontology, astronomy, Yellowstone, and Indian Education for All
- Permanent exhibits include:
    - Dinosaurs under the Big Sky
    - Montana History
    - Living History Farm
    - Enduring Peoples: Native American Hall
    - Taylor Planetarium
- Variety of changing exhibits

MUSEUM OF THE ROCKIES
MONTANA STATE UNIVERSITY

SUMMER READING KIT PROGRAM

MOR began supporting libraries in 2012 by providing:

- Theme-based kits including curriculum and activity materials for one or multiple programs
- Interactive, STEM focused lessons
- Every library with their own set of resources
  - » No need to send it on!
- A record breaking number of kits in 2018

WHAT'S IN IT

- NASA @ My Library Facilitation Kit:
    - 4 STEM activities
    - Curriculum and materials to support each activity
    - Science books and related resources
    - Kit evaluation instructions/ survey
- Calendar of future astronomical events
- Blackfeet & Crow Astronomy Teachers Guides
- Women in STEM information

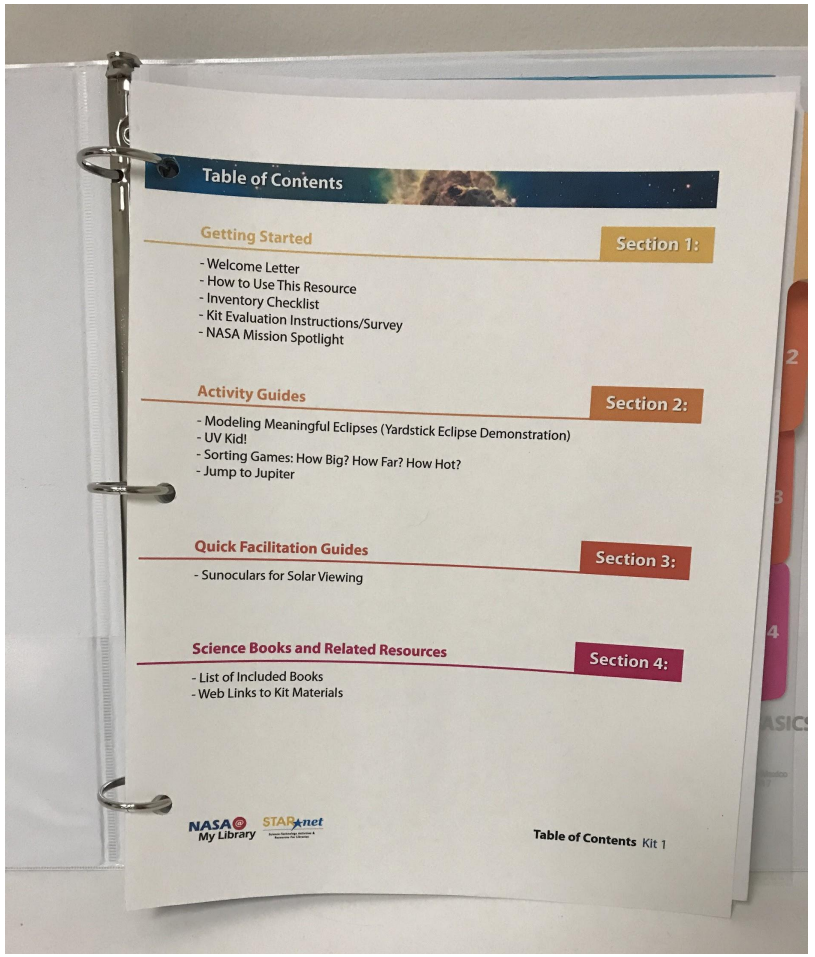
NASA @ My Library

NASA @ My Library Grant

- One of 14 State Libraries selected
- Meant to increase and enhance STEM learning opportunities for library patrons in Montana
- $5,000 in grant funds, 2 STEM kits

NASA @ My Library

Activity Guide Binder



NASA @ My Library

4 STEM ACTIVITIES

- *Modeling Meaningful Eclipses* (20-40 min.)
- *UV Kid!* (40-60 min.)
- Sorting Games: *How Big? How Far? How Hot?* (10-30 min.)
- *Jump to Jupiter* (40-60 min.)

LUNAR AND PLANETARY INSTITUTE

STAR net

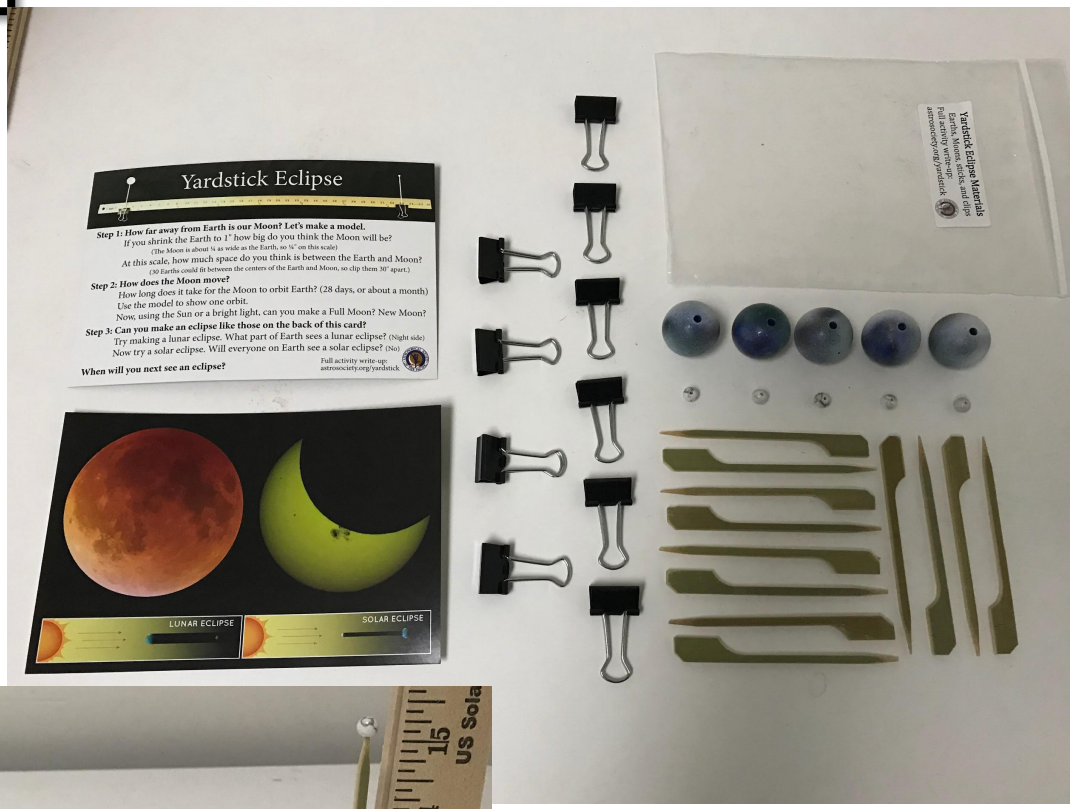
Science-Technology Activities & Resources For Libraries

NASA @ My Library

Activity 1: Modeling Meaningful Eclipses

NASA @ My Library

Activity 1: Modeling Meaningful Eclipses



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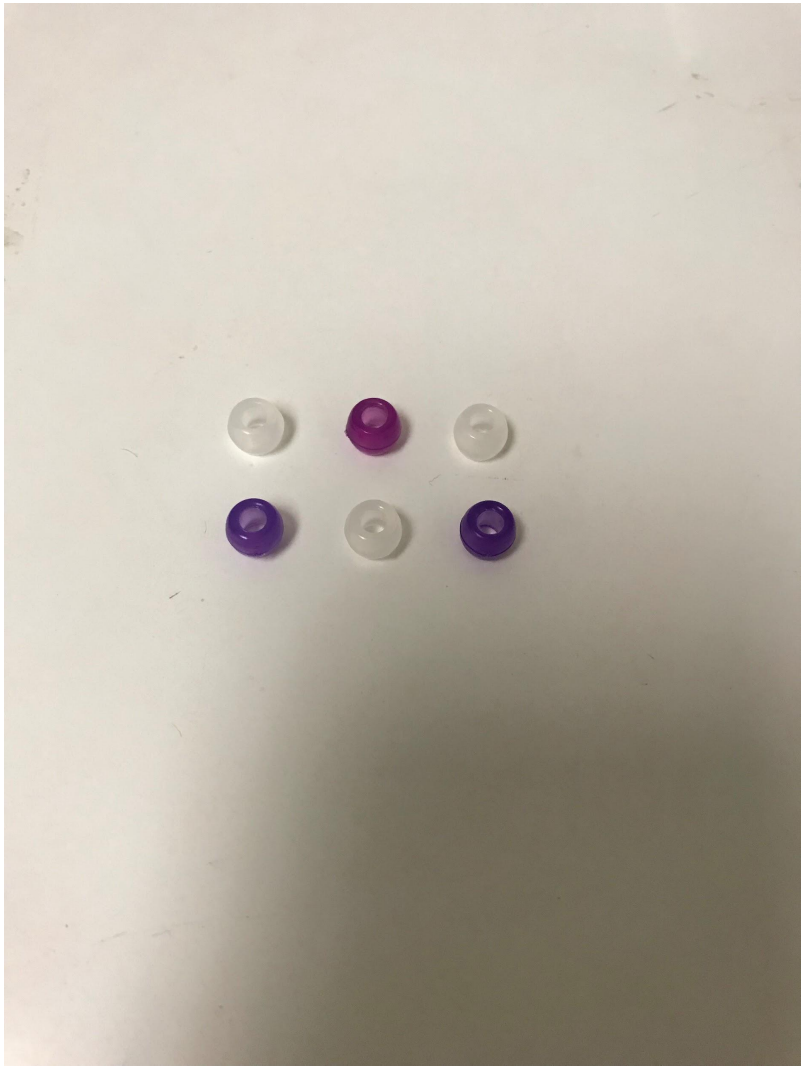
Activity 2: UV Kid

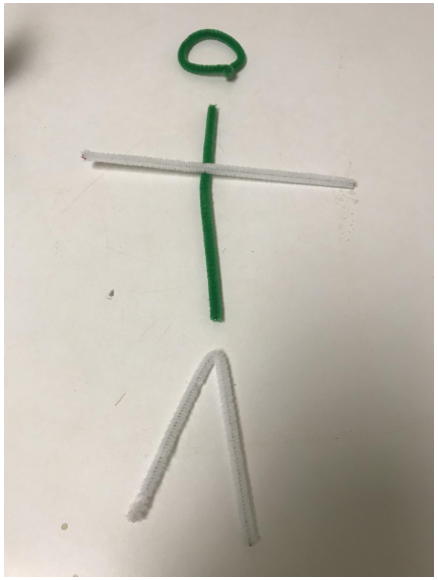
NASA @ My Library

Activity 2: UV Kid



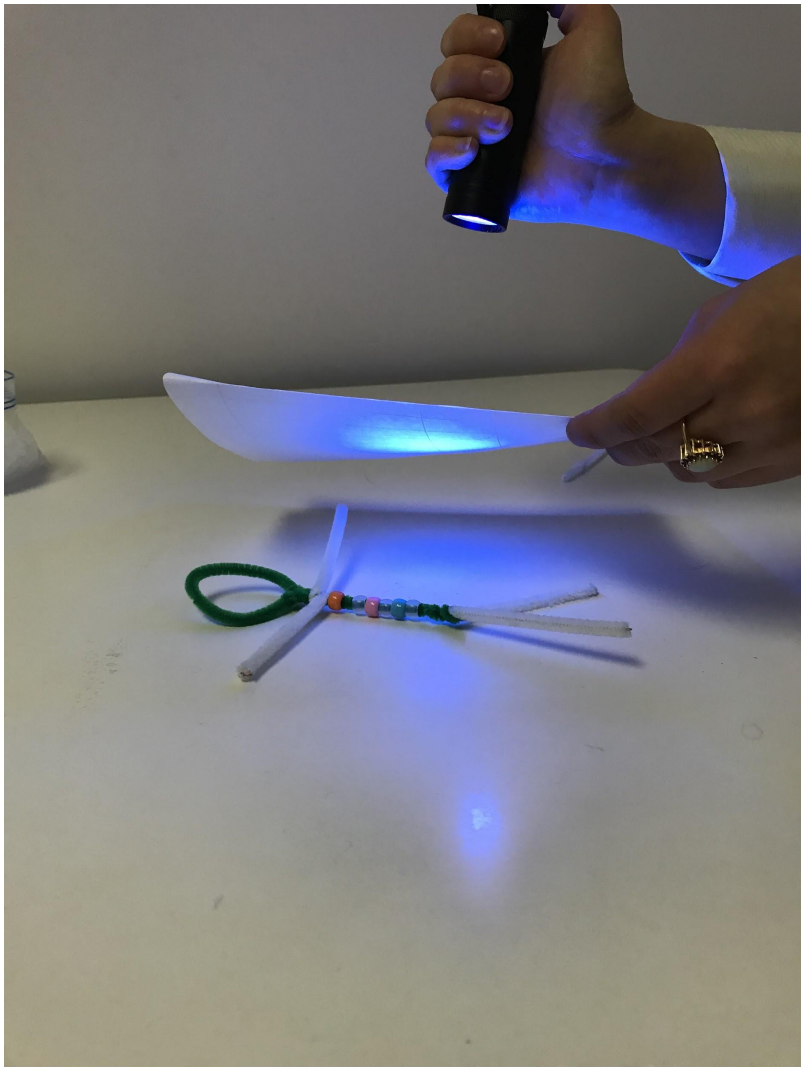
NASA@ My Library

Activity 2: UV Kid



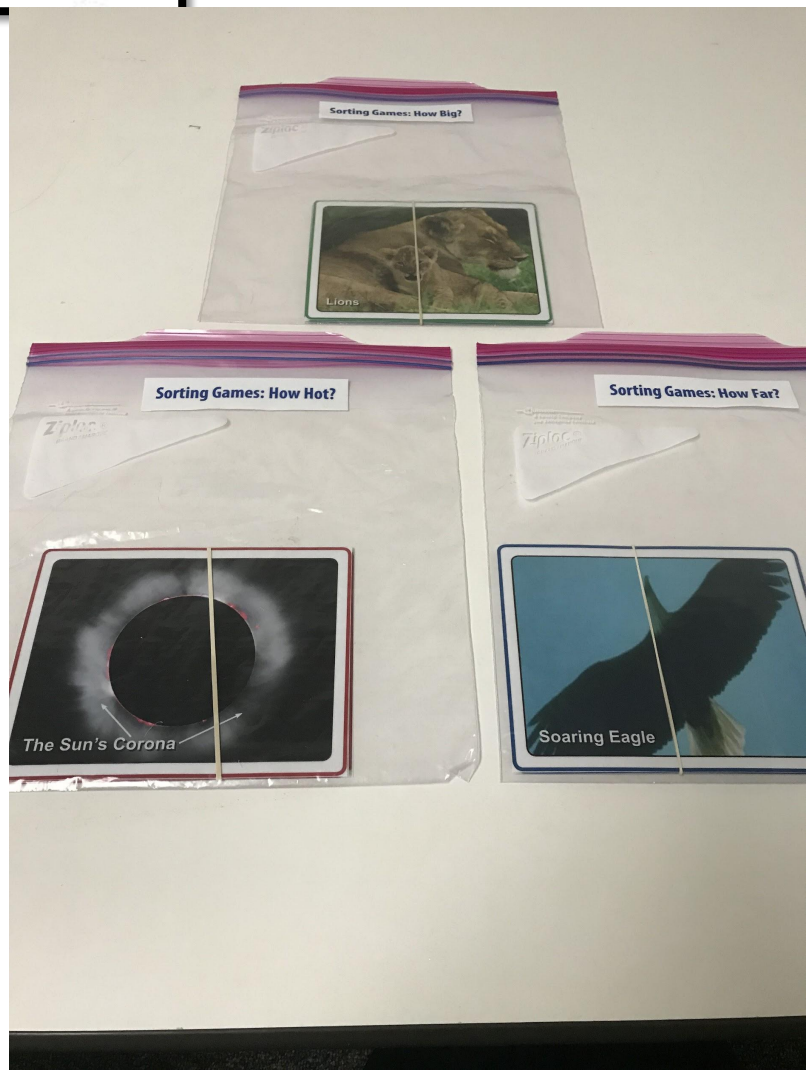
NASA@ My Library

Activity 2: UV Kid



NASA @ My Library

Activity 3: Sorting Games



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Activity 3: Sorting Games

NASA @ My Library

Activity 3: Sorting Games

NASA @ My Library

Activity 3: Sorting Games

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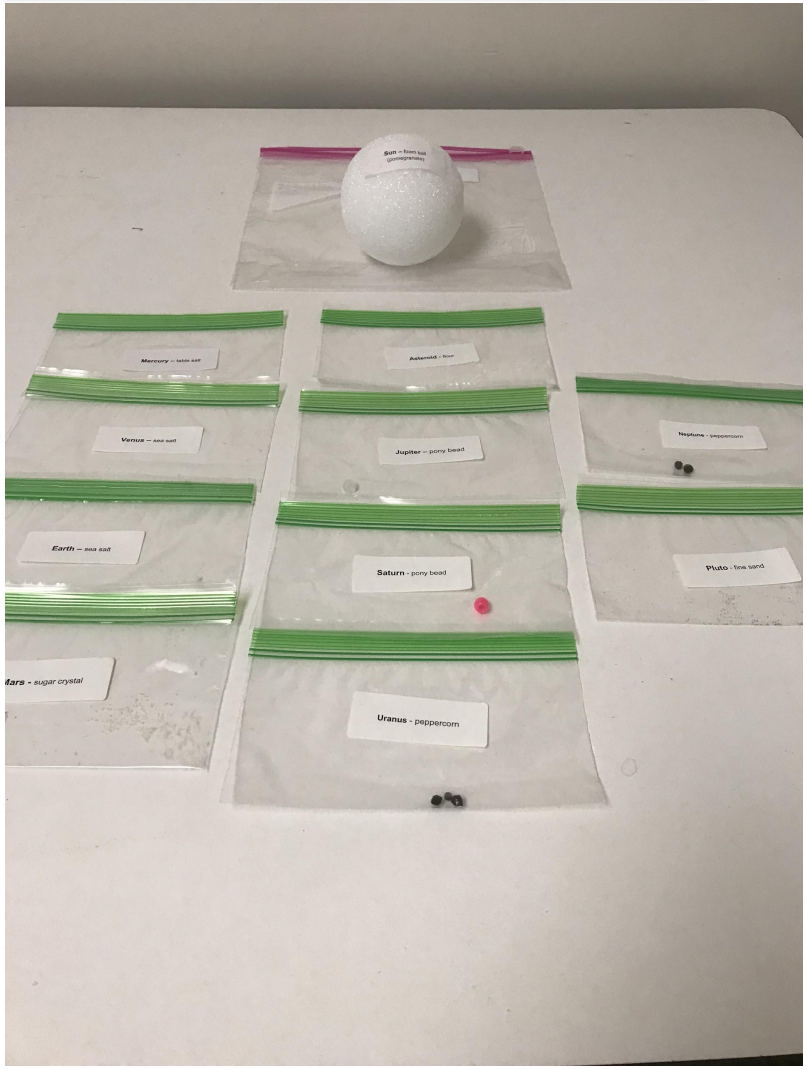
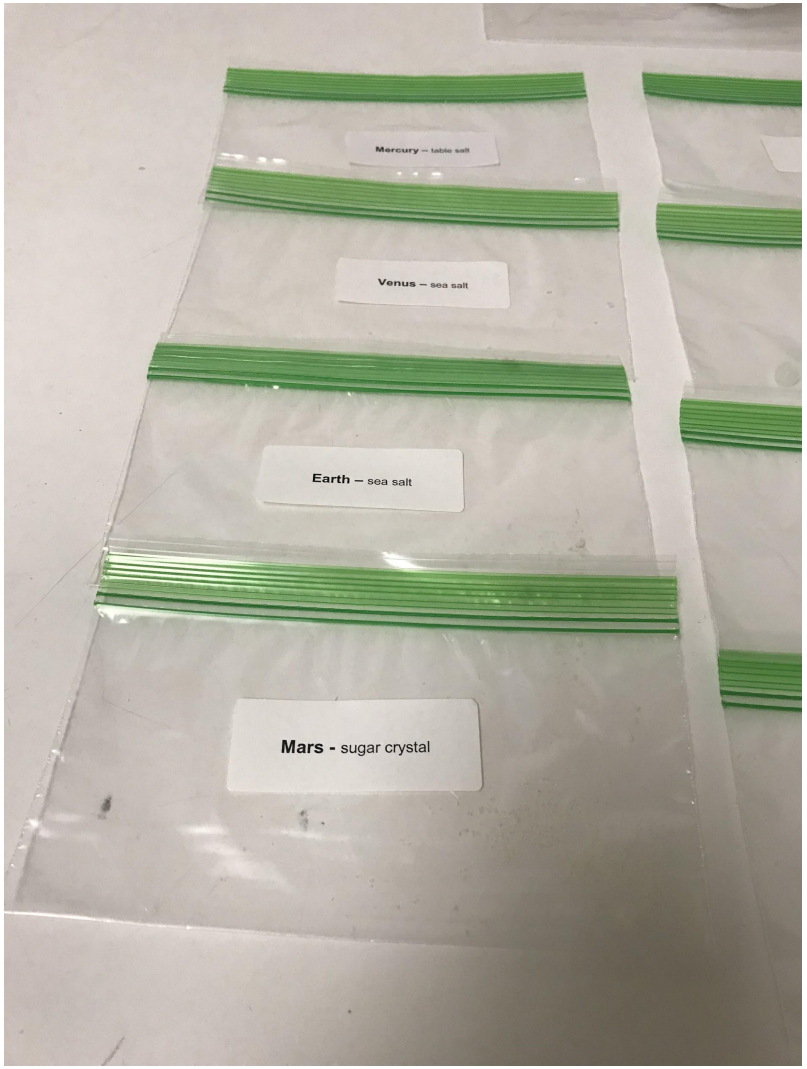
Activity 4: Jump to Jupiter





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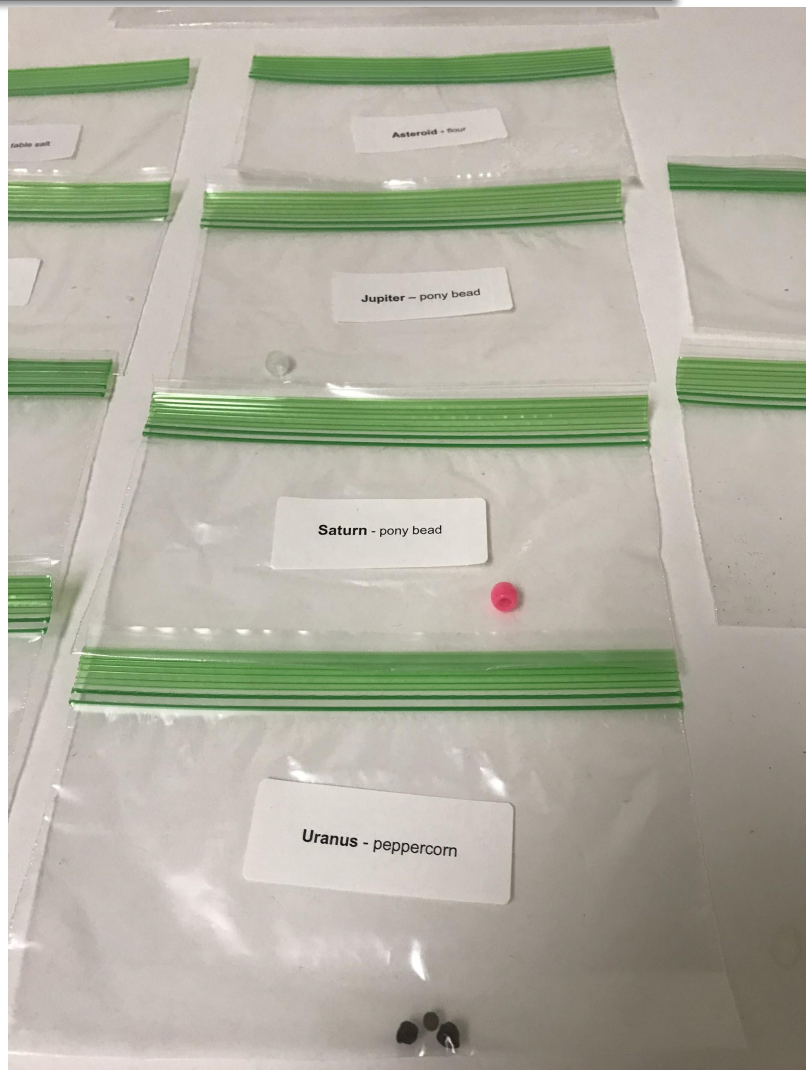
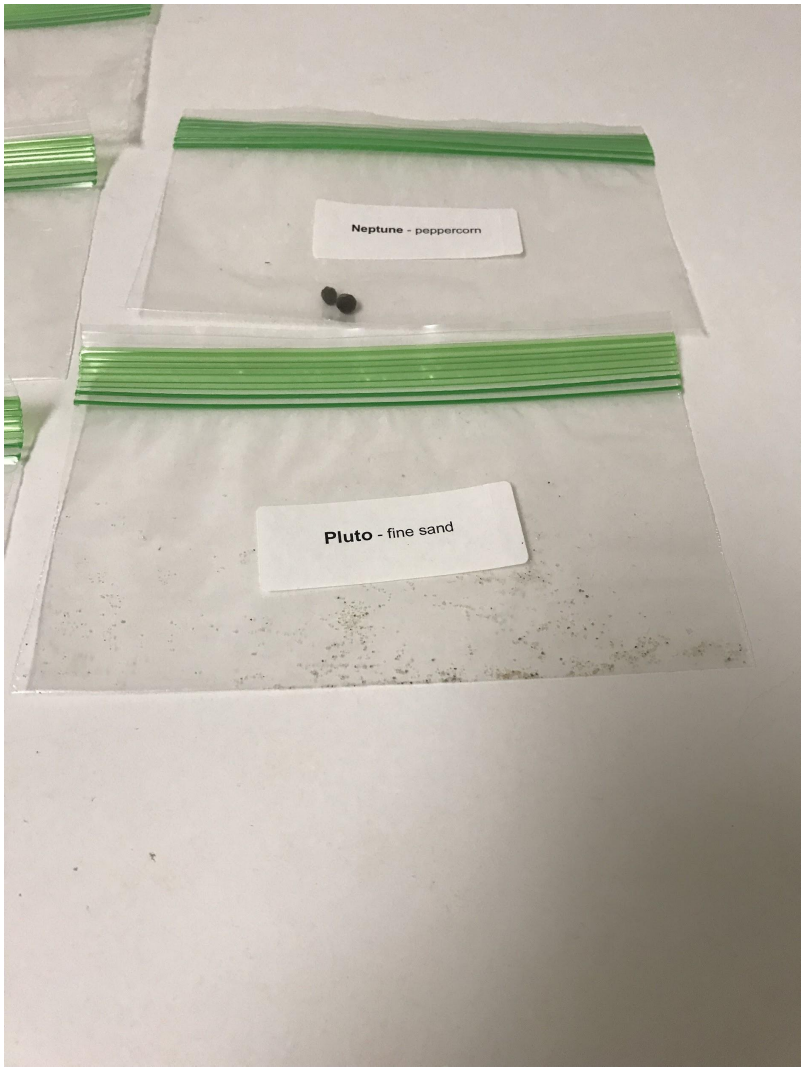
Activity 4: Jump to Jupiter





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Activity 4: Jump to Jupiter

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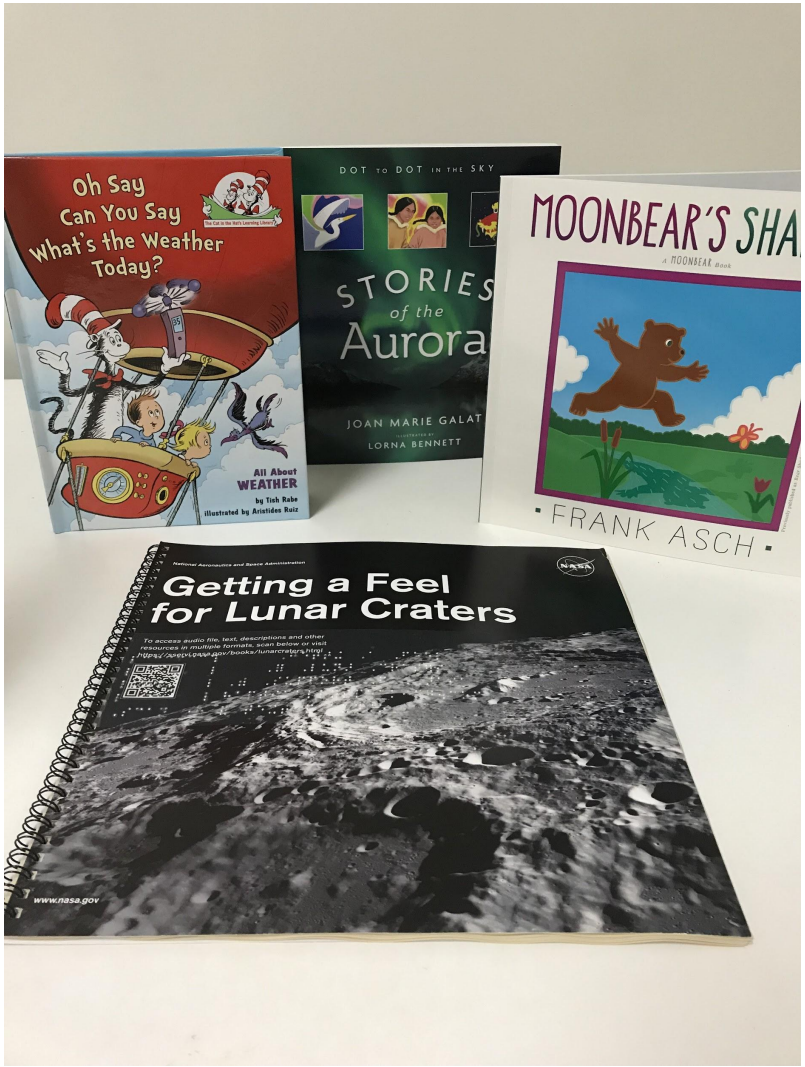
Other Kit Materials

NASA @ My Library

Other Materials: Books



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Other Materials: Sunoculars

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Added Materials

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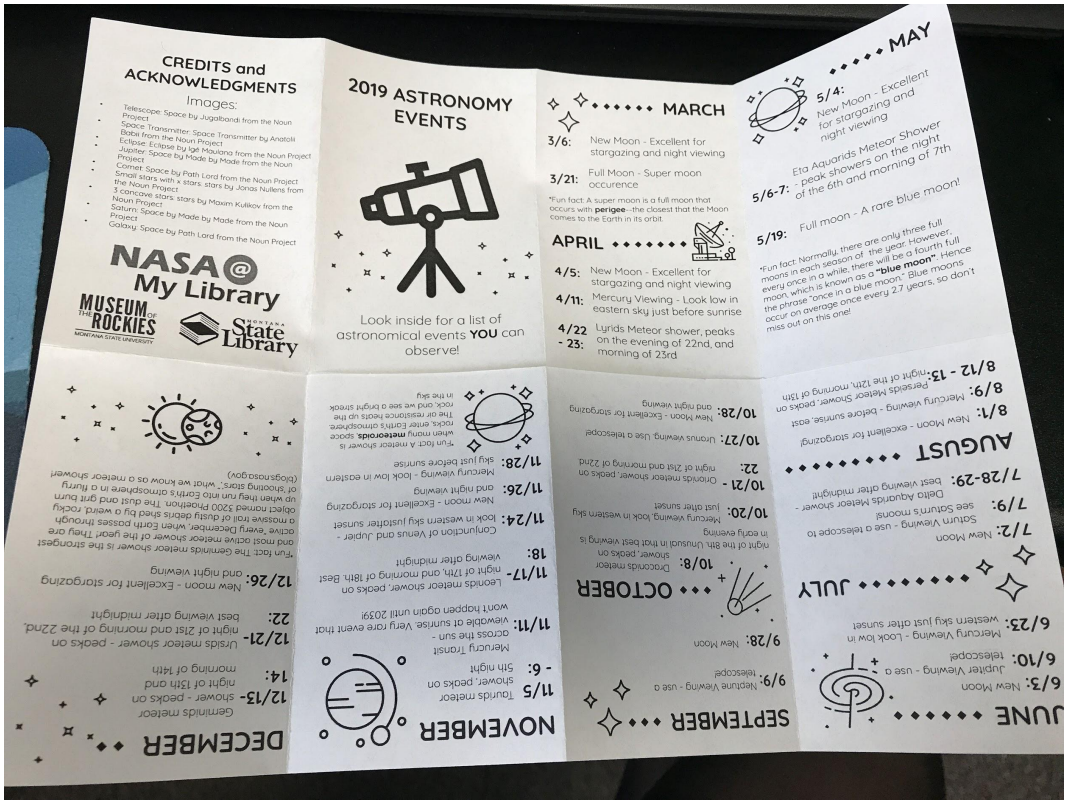
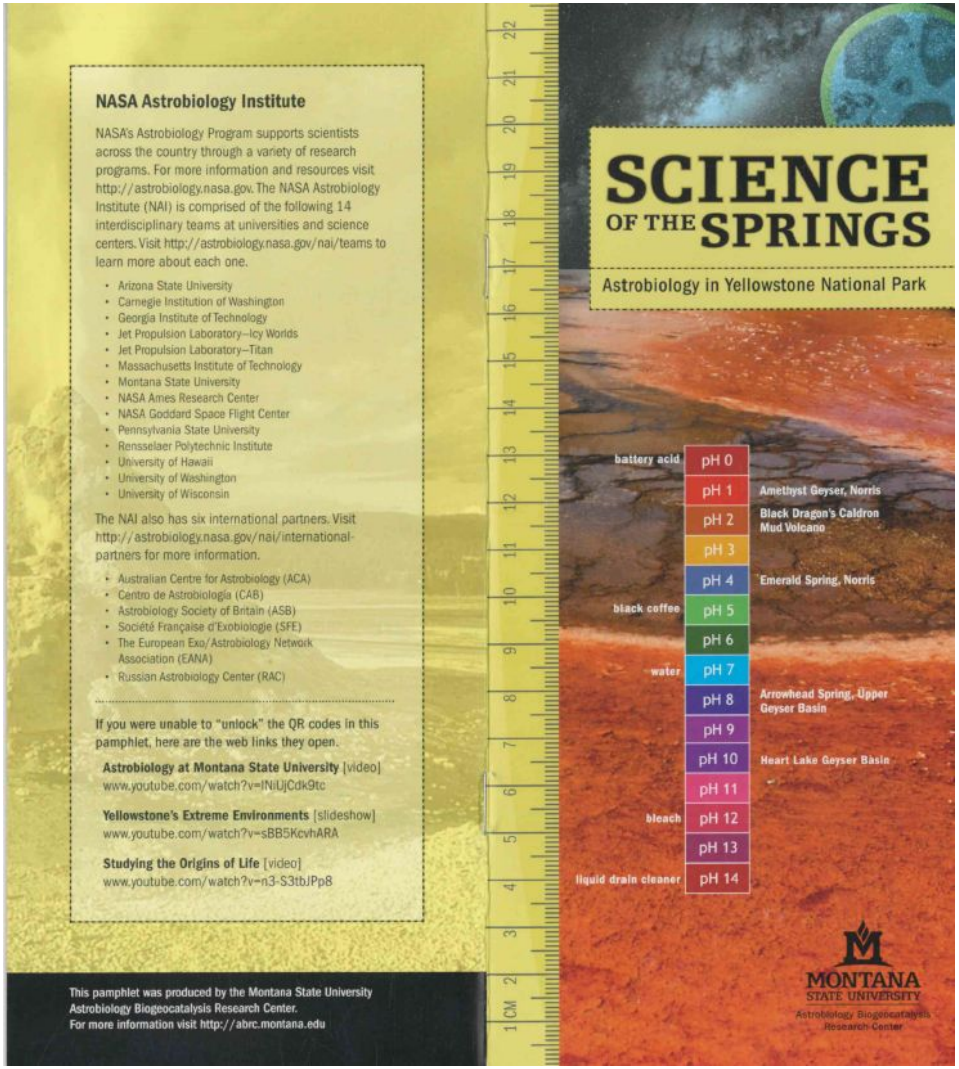
Added Materials: Astronomy Events Zine



NASA @ My Library

Added Materials: Science of the Springs



NASA Astrobiology Institute

NASA's Astrobiology Program supports scientists across the country through a variety of research programs. For more information and resources visit http://astrobiology.nasa.gov. The NASA Astrobiology Institute (NAI) is comprised of the following 14 interdisciplinary teams at universities and science centers. Visit http://astrobiology.nasa.gov/nai/teams to learn more about each one.

- Arizona State University
- Carnegie Institution of Washington
- Georgia Institute of Technology
- Jet Propulsion Laboratory–Icy Worlds
- Jet Propulsion Laboratory–Titan
- Massachusetts Institute of Technology
- Montana State University
- NASA Ames Research Center
- NASA Goddard Space Flight Center
- Pennsylvania State University
- Rensselaer Polytechnic Institute
- University of Hawaii
- University of Washington
- University of Wisconsin

The NAI also has six international partners. Visit http://astrobiology.nasa.gov/nai/international-partners for more information.

- Australian Centre for Astrobiology (ACA)
- Centro de Astrobiología (CAB)
- Astrobiology Society of Britain (ASB)
- Société Française d'Exobiologie (SFE)
- The European Exo/Astrobiology Network Association (EANA)
- Russian Astrobiology Center (RAC)

If you were unable to "unlock" the QR codes in this pamphlet, here are the web links they open.

Astrobiology at Montana State University [video]
www.youtube.com/watch?v=INiUjCdk9tc

Yellowstone's Extreme Environments [slideshow]
www.youtube.com/watch?v=sBB5KcvhARA

Studying the Origins of Life [video]
www.youtube.com/watch?v=n3-S3tbJPp8

This pamphlet was produced by the Montana State University Astrobiology Biogeocatalysis Research Center.
For more information visit http://abrc.montana.edu

SCIENCE OF THE SPRINGS

Astrobiology in Yellowstone National Park

battery acid	pH 0	
	pH 1	Amethyst Geyser, Norris
	pH 2	Black Dragon's Caldron Mud Volcano
	pH 3	
	pH 4	Emerald Spring, Norris
black coffee	pH 5	
	pH 6	
water	pH 7	
	pH 8	Arrowhead Spring, Upper Geyser Basin
	pH 9	
	pH 10	Heart Lake Geyser Basin
	pH 11	
bleach	pH 12	
	pH 13	
liquid drain cleaner	pH 14	

MONTANA STATE UNIVERSITY
Astrobiology Biogeocatalysis Research Center

Chloroflexis is a modern ancestor of the first photosynthetic organism. These interesting microbes use sunlight as an energy source, but do not produce oxygen like plants and algae. Instead, they thrive on carbon dioxide and sulfur compounds.

Q: What's the connection?

YELLOWSTONE HOT SPRINGS & Extraterrestrial Life

What we consider extreme on Earth might be similar to what is normal on other planets or moons.

Not too long ago, scientists discovered organisms that can thrive in the harshest of environments: below freezing, exceedingly hot, very acidic, as well as deep underground and at the bottom of the ocean.

These organisms are called **extremophiles**, and the environments they live in–what we consider extreme on Earth–might be similar to what is normal on other planets or moons. Many scientists think that if we find life elsewhere in the universe, it may resemble these organisms living in Earth's most extreme environments, not the little green men often shown in cartoons and movies.

Extremophiles are microbes: tiny single-celled organisms that you usually need a microscope to see. Yellowstone National Park is one of the best places on Earth to study extremophiles because the Park has such an amazing diversity of them. Yellowstone was established in 1872 as the world's first national park, and it contains half (more than 10,000) of the world's hydrothermal features, including mudpots, hot springs, fumaroles, and geysers. Each thermal feature has its own unique characteristics and hosts a wide array of extremophiles.

Scientists at Montana State University and other institutions examine these life forms and their habitats because it gives them insights into not only what our early Earth might have been like and how life may have formed on this planet, but also because it helps us better consider how life might form and exist on other planets.

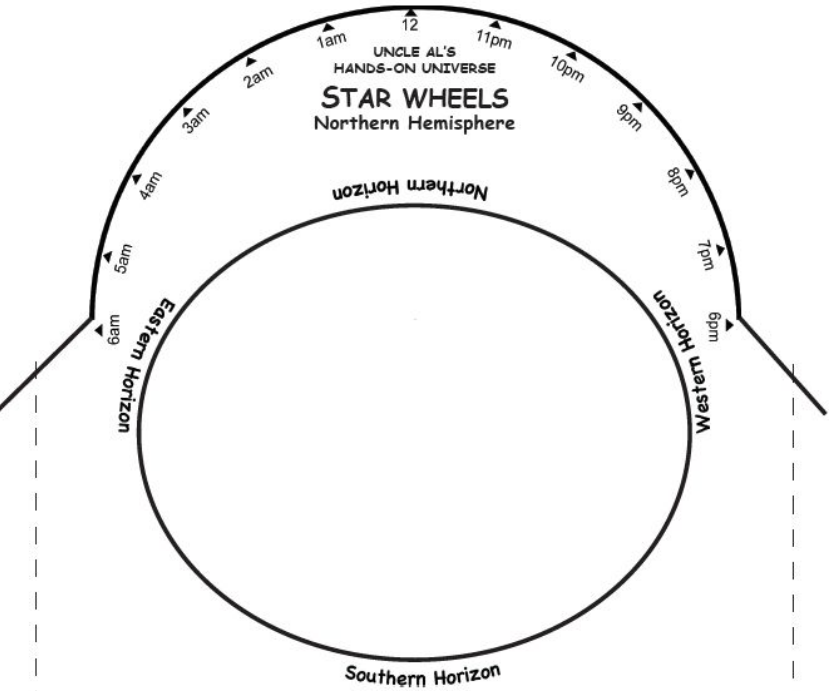
Enjoy your journey to Yellowstone's extreme environments!

View extra content using your smart phone.

Throughout this booklet you will see **QR codes** that "unlock" extra videos and content from the Internet. You need a Web-enabled phone with a camera and QR Reader software, which is installed on many phones or free to download. Search online for your phone model and "QR reader." Web links are also listed on the back.

Added Materials: Star Wheel Activity Template

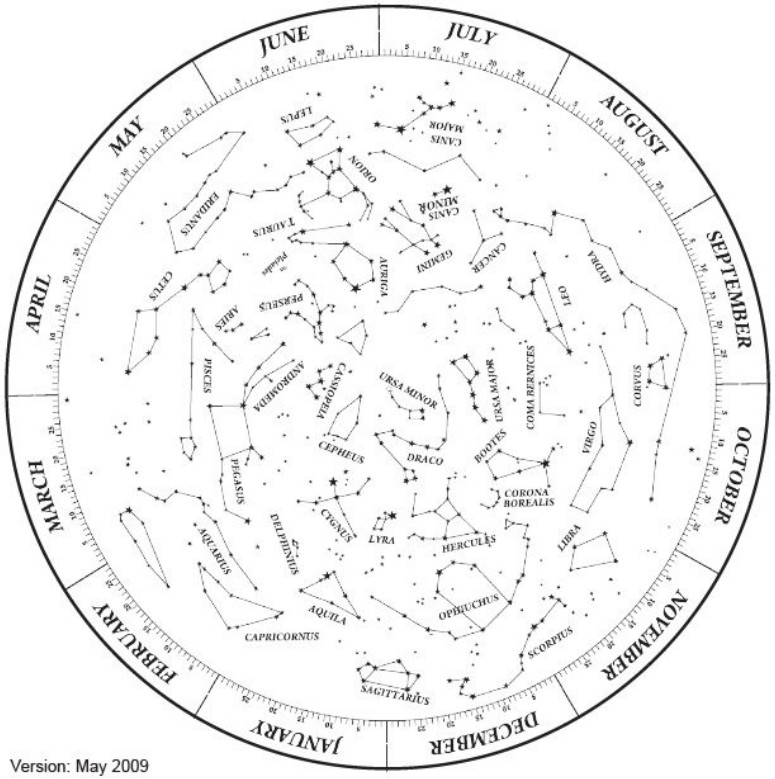
Star Wheel Holder



Version: May 2009

Instructions for Using Uncle Al's Star Wheels

1. Align your date and time, and then look up at the sky
2. Locate the constellation you want to find on the map.
3. Turn your map so the horizon it is closest to is at the bottom.
4. The star positions in the sky should match those on the wheel.



Version: May 2009

INSTRUCTIONS FOR ASSEMBLING UNCLE AL'S STAR WHEELS

Step 1: Print out all pages either on heavy cardstock or paste them onto a file folder or any other sturdy piece of cardboard.

Step 2: Cut along the black outer circle of the Star Wheel and along the solid lines on the Star Wheel Holder. Remove the interior oval shape on the Star Wheel Holder.

Step 3: On the Star Wheel Holder, fold the cardboard along the dashed lines.

Step 4: Tape or staple along the edges of the Star Wheel Holder forming a pocket.

Step 5: Place the Star Wheel in the Star Wheel Holder.

NASA@ My Library

Added Materials: Women in STEM Display

NASA @ My Library

Added Materials: Crow and Blackfeet Astronomy Guides

MONTANA SKIES
Crow Astronomy

Table of Contents

MONTANA SKIES
Blackfeet Astronomy

Table of Contents

Cataloging the Kit

- OCLC Number: 1080202558
- Does not have any of the “Added Materials” cataloged in record

URL:
https://www.worldcat.org/title/nasa-stem-facilitation-kit-1-sun-earth-moon-connections/oclc/1080202558&referer=brief_results

NASA @ My Library

How to Apply for a Kit

Application Deadline:

Friday, March 1, 2019

1. Go to Museum of the Rockies Libraries webpage:
   https://museumoftherockies.org/education/libraries
2. Fill out application form
3. You will be notified by March 8
4. Options to receive your kit:
   - MLA conference April 10-13, 2019
   - Use the Library Courier
   - Have it delivered to your physical address*

*We are hoping to avoid shipping cost and provide as many kits as possible


Other Resources

STARnet Website

1. *A Universe of Stories* Resources
   - ★ *Summer of Space*
2. STEM Activity Clearinghouse
   - ★ Sorting Tool
3. Webinars

STAR★net
Science-Technology Activities & Resources For Libraries

SPOT

Space Public Outreach Team

https://spacegrant.montana.edu/spot.html

- Provides FREE presentations about current NASA missions and research
- Located in MSU Bozeman and UM Missoula
- Can travel, but attendance requirements for farther locations
- Limited availability, so ask early about scheduling

A service of the Montana Space Grant Consortium

MSGC

SSA: Lynn Powers

Solar System Ambassador: Lynn Powers

Email: l.powers@smasweb.org

- Provides space-related programming, outreach, and resources
- Scheduling more flexible in the summer, but limited availability
- No presenter fee, but gas reimbursement charged
- Topics: Apollo landing 50th anniversary, “Ask an Astronomer”, Moon Geology, and much more!

Big Sky Astronomy

Night Sky Network: Big Sky Astronomy

Mark Paulson, mhpaulson@gmail.com

http://www.bigskyastroclub.org/

- Local astronomy club in Kalispell
- Available for presentations and astronomy programming
- Free to book, but limited to Western Montana
- Limited availability
- List of presentation topics: http://docs.msl.mt.gov/librariesweb/documents/NASA/BigSkyAstronomyPresentationList.pdf

Stellarium

Free Open Source Planetarium

http://stellarium.org/

- Shows a realistic sky on your computer
- Easy to use, no special requirements, FREE
- Lessons on MSL webpage that you can use: http://libraries.msl.mt.gov/lifelonglearning/NAML

MOR Outreach

Museum of the Rockies

STARLab and Outreach Kits

Bring Museum of the Rockies to your library!

Real fossils and artifacts, unique hands-on activities and lesson plans.

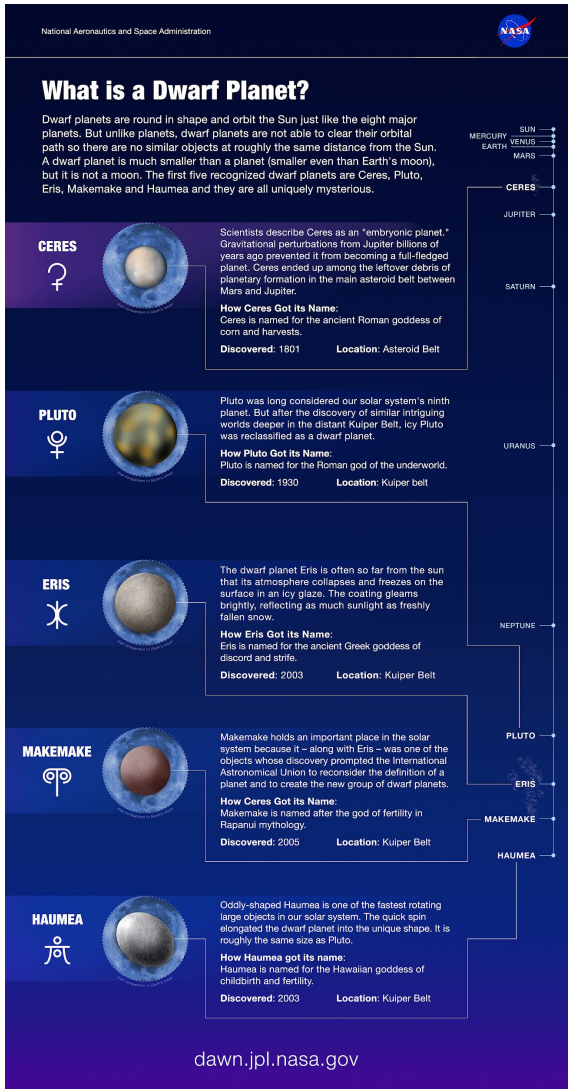
Resources support STEM education, Montana Content Standards and Indian Education for All.
Help your students learn MORE without being at MOR.

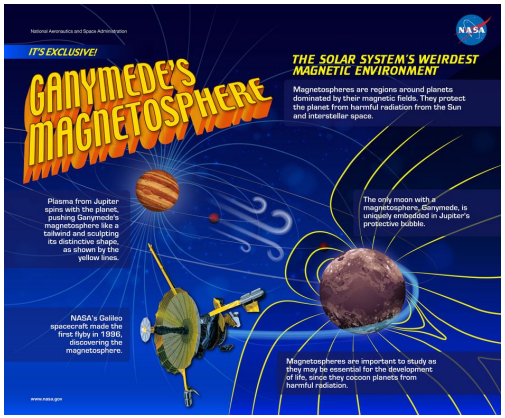
RESERVE THE PORTABLE PLANETARIUM TODAY!

MUSEUM OF THE ROCKIES
MONTANA STATE UNIVERSITY

STARLAB

JPL Infographics






A UNIVERSE of Stories
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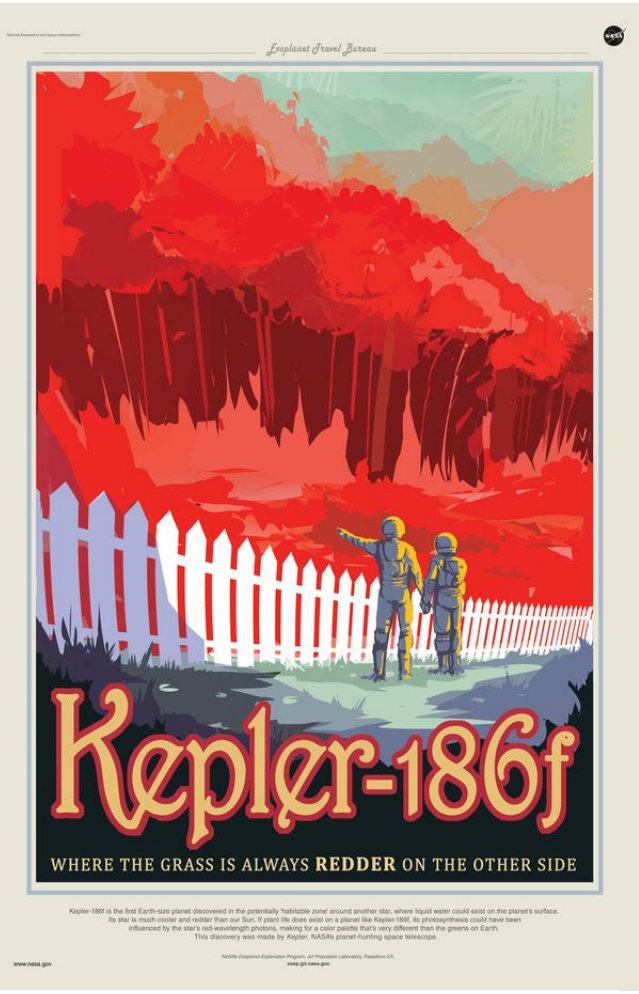
JPL Posters


Exoplanet Travel Bureau
Kepler-186f
WHERE THE GRASS IS ALWAYS REDDER ON THE OTHER SIDE
Kepler-186f is the first Earth-size planet discovered in the potentially 'habitable zone' around another star, where liquid water could exist on the planet's surface.
Its star is much cooler and redder than our Sun. If plant life does exist on a planet like Kepler-186f, its photosynthesis could have been
influenced by the star's red-wavelength photons, making for a color palette that's very different than the greens on Earth.
This discovery was made by Kepler, NASA's planet-hunting space telescope.
NASA's Exoplanet Exploration Program, Jet Propulsion Laboratory, Pasadena CA
www.nasa.gov
exep.jpl.nasa.gov


Exoplanet Travel Bureau
VISIT THE PLANET WITH NO STAR
PSO J318.5-22
WHERE THE NIGHTLIFE NEVER ENDS!
Discovered in October 2013 using direct imaging, PSO J318.5-22 belongs to a special class of planets called rogue, or free-floating, planets. Wandering alone in the galaxy,
they do not orbit a parent star. Not much is known about how these planets come to exist, but scientists theorize that they may be either failed stars or planets ejected from
very young systems after an encounter with another planet. These rogue planets glow faintly from the heat of their formation. Once they cool down, they will be dancing in the
dark. Confirmed and candidate exoplanets and all available data are listed in the NASA Exoplanet Archive.
NASA's Exoplanet Exploration Program, Jet Propulsion Laboratory, Pasadena CA
www.nasa.gov
exep.jpl.nasa.gov


Exoplanet Travel Bureau
EXPERIENCE THE GRAVITY OF
HD 40307g
A SUPER EARTH
Twice as big in volume as the Earth, HD 40307g straddles the line between "Super-Earth" and "mini-Neptune" and scientists aren't sure if it has a rocky
surface or one that's buried beneath thick layers of gas and ice. One thing is certain, though: at eight times the Earth's mass,
its gravitational pull is much, much stronger.
NASA's Exoplanet Exploration Program, Jet Propulsion Laboratory, Pasadena CA
www.nasa.gov
exep.jpl.nasa.gov

NASA @ My Library Kit 2

NASA @ My Library Kit 2:

Be a NASA Detective - Expanding Your Senses

http://libraries.msl.mt.gov/lifelonglearning/NASAStemKit

- Similar set up to Kit 1, different activities you can do
- Has a telescope, and binoculars
- Will be an MSL-hosted collection - tour model
- More details forthcoming on how to host it after MLA

QUESTIONS? FEEDBACK?

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MONTANA State Library

MUSEUM OF THE ROCKIES
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