NASA @ My Library

2019 Summer Reading Program

Montana State Library
Museum of the Rockies

Webinar: Wednesday, February 13, 2019
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
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
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 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
Activity Guide Binder

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**NASA STEM Facilitation Kit**

Sun-Earth-Moon Connections

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**Table of Contents**

**Getting Started**
- Welcome Letter
- How to Use This Resource
- Inventory Checklist
- Kit Evaluation Instructions/Survey
- NASA Mission Spotlight

**Activity Guides**
- Modeling Meaningful Eclipses (Yardstick Eclipse Demonstration)
- UV Kidd! (Ultraviolet Sensitivity)
- Sorting Games: How Big? How Far? How Hot?
- Jump to Jupiter

**Quick Facilitation Guides**
- Sunoculos for Solar Viewing

**Science Books and Related Resources**
- List of Included Books
- Web Links to Kit Materials
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.)
Activity 1: Modeling Meaningful Eclipses
Activity 1: Modeling Meaningful Eclipses

Yardstick Eclipse

Step 1: How far are you from Earth if the Moon? Let's make a model.
If you put the Moon at the far end of a yardstick (or other measuring stick) and the Earth at the near end, the Moon will appear to be a certain distance away from the Earth. How far away is the Moon? Estimate this distance and record it.

Step 2: How close is the Moon to the Earth? Use a smaller model of the Moon to represent the actual size of the Moon. Place the Moon model at the near end of the yardstick and move it closer to the Earth until the Moon model and the Earth model appear to be the same size. Record the new position of the Moon model.

Step 3: Can you make a model of a solar eclipse? Place a small object (like a key or marker) in front of the Moon model to represent the Sun. Observe the eclipse as the Moon model moves closer to the Earth model. Record your observations.

Step 4: Can you make a model of a lunar eclipse? Place the Moon model behind the Earth model to simulate the Moon being in Earth's shadow. Observe the eclipse as the Moon model moves closer to the Earth model. Record your observations.

What will you see if you make an eclipse? Will everyone see an eclipse? Why or why not?
Activity 2: UV Kid

- UV flashlight
- Bag of colorful beads
- Bag of pipe cleaners
Activity 2: UV Kid
Activity 2: UV Kid
Activity 2: UV Kid
Activity 3: Sorting Games
Activity 3: Sorting Games

- Lions
- International Space Station
- Moon
- Mars
- Earth
- Jupiter
- Sun in Ultraviolet Light
- Solar System
- Andromeda Galaxy
Activity 3: Sorting Games

- Soaring Eagle
- Jet Airplane at Cruising Altitude
- Hubble Space Telescope
- Aurora Northern Lights
- Sun in Ultraviolet Light
- Moon
- Constellation & Nebula
- Saturn
- Andromeda Galaxy
Activity 3: Sorting Games

- The Sun’s Corona
- Comet
- Sunspot
- The Sun’s Core
- Earth’s Core
- Lightning
- Meteor
- Surface of the Sun
- Volcanic Lava
Activity 4: Jump to Jupiter
Activity 4: Jump to Jupiter
Other Kit Materials
Other Materials: Sunoculars
Added Materials
2019 ASTRONOMY EVENTS

Look inside for a list of astronomical events YOU can observe!
Added Materials: Science of the Springs

SCIENCE OF THE SPRINGS
Astrobiology in Yellowstone National Park

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!
INSTRUCTIONS FOR ASSEMBLING UNCLE AL'S STAR WHEELS

Step 1: Print out all pages with an 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: Place the Star Wheel Holder in the slot provided in the Star Wheel Holder.
Step 4: Tape or staple along the edges of the Star Wheel Holder to attach the Star Wheel to the Star Wheel Holder.

Version: May 2009

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Uncle Al’s HOU Star Wheels are based on LHS Sky Challenges created by Bud Weitz and available through the LHS Discovery Corner Store 520-447-1076
http://fberkley.edu/users/AJT120D51/astronomy.html

Download Uncle Al’s Sky Wheels from http://fberkley.edu/users/AJT120D51/astronomy.html

Instructions for Using Uncle Al’s Star Wheels:

1. First, you must decide what time and day you are looking at the sky.
2. Look up the desired time and day from the sky chart and then read the section for that time and day.
3. Print out the desired chart for the correct time and day and cut along the solid lines.
4. 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.
5. Place the Star Wheel Holder in the slot provided in the Star Wheel Holder.
6. Tape or staple along the edges of the Star Wheel Holder to attach the Star Wheel to the Star Wheel Holder.

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# Crow Astronomy

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- Constellations / Star Maps Activities: Earth Maps and Star Maps: 18
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# Blackfeet Astronomy

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- Listening to the Blackfeet Stories: 4
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## Blackfeet Stories and Science Stories

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- Scarface Spiral Galaxies Activity: Making the Milky Way: 14
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- Browning High School Singers—Blackfeet Star Stories Song: 36
- Say It in Blackfeet: 37
- Resources: 38
Cataloging the Kit

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

URL:
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
1. **A Universe of Stories Resources**
   - ★ **Summer of Space**

2. **STEM Activity Clearinghouse**
   - ★ **Sorting Tool**

3. **Webinars**
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
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!
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:
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
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!
**What is a Dwarf Planet?**

Dwarf planets are round in shape and orbit the Sun just like the eight major planets. But unlike planets, dwarf planets are not able to clear their orbital paths so there are no similar objects at roughly the same distance from the Sun. A dwarf planet is much smaller than a planet; generally less than 1000 km across, but it is not a moon. The first five recognized dwarf planets are Ceres, Pluto, Eris, Makemake and Haumea and they are all uniquely mysterious.

**CERES**
Scientists describe Ceres as an "embryonic planet." Observations of its nucleus over the years has proven this fact becoming a full-fledged planet.
- **Name:** Ceres
- **Known as:** The smallest dwarf planet in the Solar System
- **Distance:** 28.5 AU
- **Discovered:** 1801
- **Location:** Asteroid Belt

**PLUTO**

Pluto was long considered our solar system's ninth planet. But after the discovery of similar drifting objects, the dwarf planet status was restored. Over time, it's likely Pluto was reclassified as a dwarf planet.
- **Name:** Pluto
- **Known as:** The smallest dwarf planet in the Solar System
- **Distance:** 39.5 AU
- **Discovered:** 1930
- **Location:** Kuiper Belt

**ERIS**

This dwarf planet is often as far from the Sun that its atmosphere condenses and freezes on the surface in icy glass. The rotating planet is known for its unique "hydropod." It's likely the surface of the planet was once frozen in a liquid state.
- **Name:** Eris
- **Known as:** The fourth largest dwarf planet
- **Distance:** 38.7 AU
- **Discovered:** 2005
- **Location:** Kuiper Belt

**MAKEMAKE**

Makemake holds an important place in the dwarf planet discovery, helping to confirm the identification of these objects whose discovery propels the International Astronomical Union's classification of a planet and to make the new group of dwarf planets.
- **Name:** Makemake
- **Known as:** The first dwarf planet discovered beyond Pluto
- **Distance:** 37 AU
- **Discovered:** 2005
- **Location:** Kuiper Belt

**HAUMEA**

Cricket-shaped Haumea is one of the fastest rotating large objects in our solar system. The quick spin is believed to have inflated it to the shape we see. It is roughly the same size as Pluto.
- **Name:** Haumea
- **Known as:** The third largest dwarf planet
- **Distance:** 34.3 AU
- **Discovered:** 2005
- **Location:** Kuiper Belt

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dawn.jpl.nasa.gov
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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