NISE Net Online Workshop

What's in your 2018 Explore Science: Earth & Space toolkit?

Tuesday, February 6, 2018



Welcome!

Today's presenters are:

Ali Jackson, Sciencenter

Thai Chang, Science Museum of Minnesota

Ethan Kruszka, Science Museum of Minnesota

& the NISE Network toolkit team



As we wait to get started with today's discussion, please:

Introduce yourself! Type your name, institution, and location into the Chat Box

Questions? Feel free to type your questions into the <u>Chat Box</u> at any time throughout the webinar or use the raise your hand function in the participants list and we'll unmute your microphone.

Today's discussion will be recorded and shared on nisenet.org at: <u>nisenet.org/events/onlineworkshop</u>

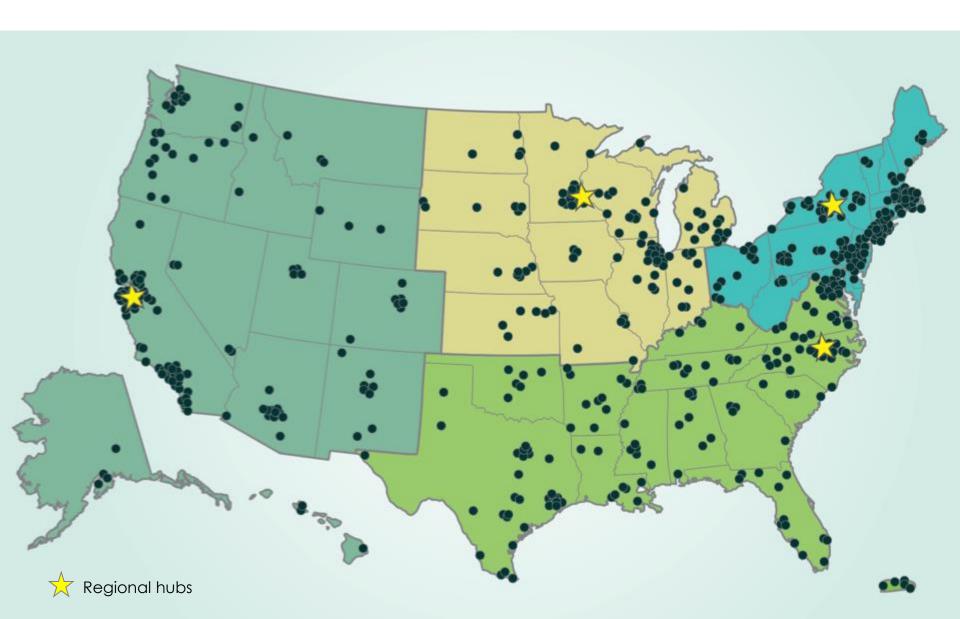
Online Workshop Overview



NISE Network Overview

Explore Science: Earth & Space Toolkit

2018 Toolkit Activities Q/A **Hundreds of organizations** regularly participate in NISE Network activities.



Stay Connected

NORTHEAST - Ali Jackson - Sciencenter, Ithaca, NY

Northeast: NY, VT, NH, ME, RI, CT, and MA

Mid-Atlantic: PA, NJ, MD, DC, DE, OH, and WV

SOUTHEAST – Brad Herring - Museum of Life and Science, Durham, NC

Southeast: VA, NC, SC, KY, TN, LA, MS, AL, GA, FL, and

Puerto Rico

South: TX, AR, and OK

MIDWEST – Christina Leavell - Science Museum of Minnesota, St. Paul, MN

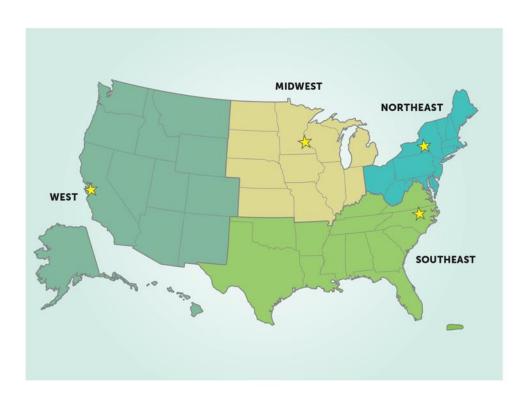
ND, SD, NE, KS, MN, IA, MO, WI, IL, MI, and IN

WEST – Frank Kusiak - UC Berkeley Lawrence Hall of

Science, Berkeley, CA

Southwest: CA, NV, AZ, and HI

West AK, WA, OR, ID, MT, WY, CO, UT, and NM



Earth and Space

GOALS

Engage public and professional audiences in learning about Earth and space sciences

Encourage new and strengthened partnerships among national and local organizations that support informal and lifelong learning





Explore Science: Earth & Space



STEM Focus



Disciplinary

- Heliophysics
- Earth science
- Planetary science
- Astrophysics

Cross-disciplinary

Science, technology, and society

Learning Framework

- 1. Experience Earth and space **PHENOMENA** and explore science findings.
- 2. Use the scientific **PROCESS** and reflect on science as a way of knowing.
- 3. **PARTICIPATE in** the scientific community and identify as a science learner.



Design



Overall:

- Inviting, appealing, and engaging
- Compatible with the exhibition design

Materials and maintenance:

- Safe for visitors of all ages
- Easy to, set up, clean up, and store
- Consumables are inexpensive and readily available

Accessibility:

- Universal Design approach
- Bilingual English and Spanish

Design principals:

- Engaging
- Authentic
- Current
- Relevant

Target Audiences



Public: Informal and lifelong learners

- Museum audiences
 - Families with children ages 4-10
 - School groups K-6
 - Other museum visitors
- Underserved audiences
 - Museum visitors
 - Offsite programs

Professional: Informal educators

- Museum educators
- Educators in out of school settings

Promotional Resources





Promotional materials, including banner, ads, poster, photos

Planning and Training





Tips for leading hands-on activities

Greet your guests

viect your guests
Say 'hello,'' make eye contact, and smile. People will come over if you look wekoming, available, say rienu, make eye contact, and sinile, reupie will come over if you look welcoming, available, and friendly, As much as possible, let your guests do the hands-on parts of the activity, and let them

Encourage exploration
Provide positive feedback and assistance when people need it, but let them experiment and learn for Provise postive revolució and association when people nied is, vol, let unen experiment and rean two themselves. Don't insist people do things the "right" way—sometimes learning how something doesn't

NK open-enced questions (elp people observe and think about the activity. Try to use questions that have more than one wer, such as: "what do you see happening;", "why do you while that happened;", " about what you saw?", and "Does this remind you of anything you've seen before?"

8000 ISSENE Recessed in what your guests tell you, and let their curiosity and responses drive your conversation

at you know simple language. Focus on one main idea—you don't need to explain everything at one

mples can help explain abstract c do not have the same skills or v

't quite grasped a concept, you pn't say, "No" or "Wrong." You (See the other side of this st

pout something, it's ok to say, more, either by trying and

aggest other activities th

Using positive responses with difficult concepts

What are misconceptions?

Throughout life we make observations and form patterns to try to understand the world around us. People often use mental shortcuts grounded in previous experiences to make sense of difficult recently concept and the previous experiences to make sense of difficult recently and the previous experiences to make sense of difficult recently and the previous experiences to make sense of difficult recently and the previous experiences or are too simple. Our intuitive recently concept of the previous experiences are to make the previous experiences are to make the previous experiences are to make the previous experiences. The previous experiences are the previous experiences are the previous experiences are the previous experiences.

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For example, once Observation we make at a young age is that the closer you are to a hot stove, the hoster varies or this observation we make at a young age. For example, one observation we make at a young age is that the closer you are to a hot stove, the thorter you get. This observation can lead to the common misconception that warmer temperature in the summer happen because carn is closer to the Sun. The scientific explanation from seasons on Earth is some proper because carn is closer to the Sun. The scientific explanation for light is a more difficult concept to deservated—involving the angle of Earth and the amount of light is a more difficult concept to deservated—involving the angle of Earth and the amount of light is a more difficult concept to deservated—involving the angle of Earth and the amount of light is a some concept to the scientific explanation is a scientific explanation of the scientific explanation is a scientific explanation of the scientific explanation is a scientific explanation of the scientific explana

Building scientific thinking

Overcoming and avoiding nisconceptions requires more than just providing the correct scientifically about the separation Mands on activities are a good way to help visitors think more scientifically about the visitors with Mands on activities are a good way to help visitors think more scientifically about the visitors than the manufacture of the providing the concept comes up, try to build on previous knowledge and experience in a gostive way.

experience in a positive way.

Help participant, express their thinking by asking open-ended questions.

Suggest the participant consider new information. Use the activity or model to demonstrate endered and support a new way of thinking. It is not not be near-invanted and are moved to making these sections are described to the sections and are moved to making these sections are described to the sections and are moved to making these sections are described to the section of the sections are described to the section of th evidence and support a new way of thinking.

Lister to the participant and respond to what they are saying. Try the "Yes, and..." approach, the to the participant and respond to what they are saying. Try the "Yes, and that is helpful borrowed from improvisational siteater. YES, I acknowledge something you said that is helpful to order that will be a say to the say they are the say that they are the say that they are the say that they are they are the say that they are the say that they are the say that they are they are they are they are the say that they are they are the say that they are the are they are the they are they are they are they are the they are th

help deepen your understanding.

AND respond with...

YES, Earth does look flat to us, AND that's because it's so big that we can't tell that it's actually shaped like a ball. Let's earnine this scale model Earth experiment. YES, it is usually true that when you get closer to something hot you get warmer, AND

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YES, it is usually true that when you get closer to something hot warmer in the northern hermisphase, when it's calle model of the Earth to chart,

where hermisphase during the warm.



Exploring Earth: Paper Mountains



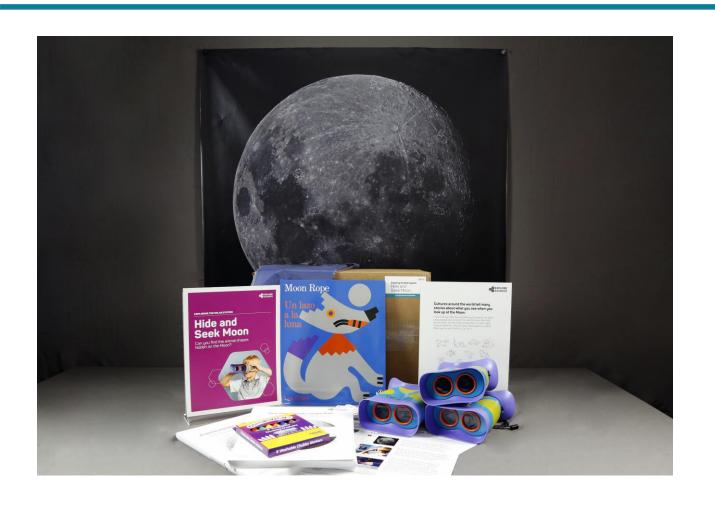


Exploring the Solar System: Craters





Exploring the Solar System: Hide and Seek Moon





Exploring the Solar System: Magnetic Fields



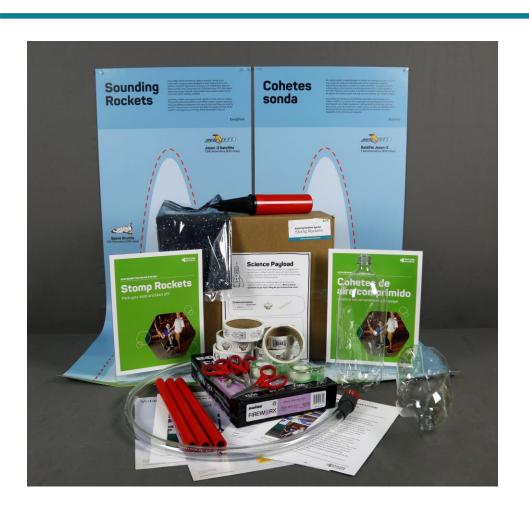


Exploring the Solar System: MarsRovers



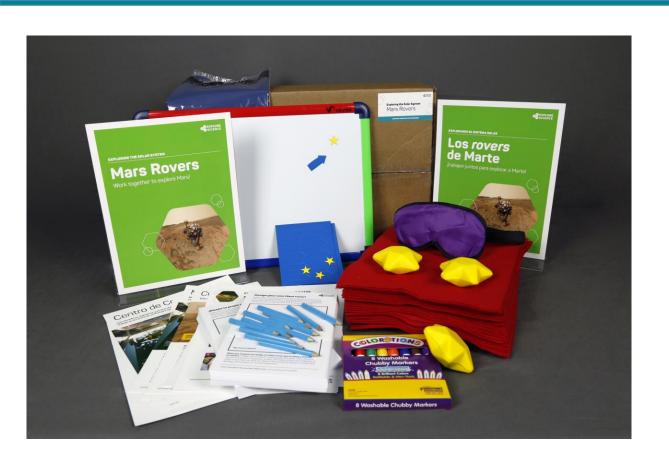


Exploring the Solar System: StompRockets



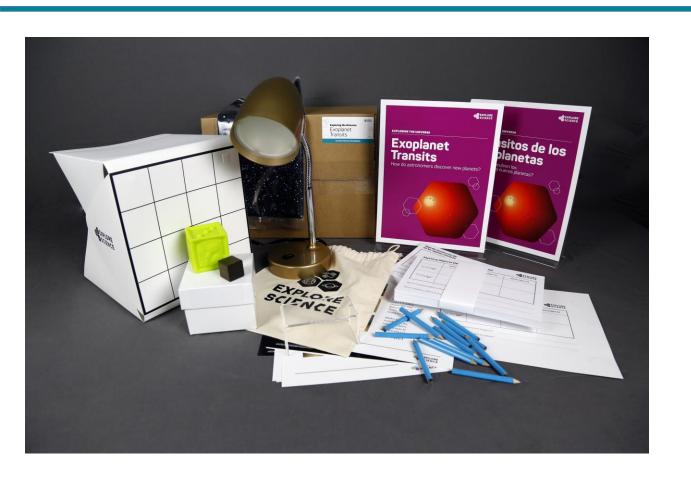


Exploring the Solar System: MarsRovers



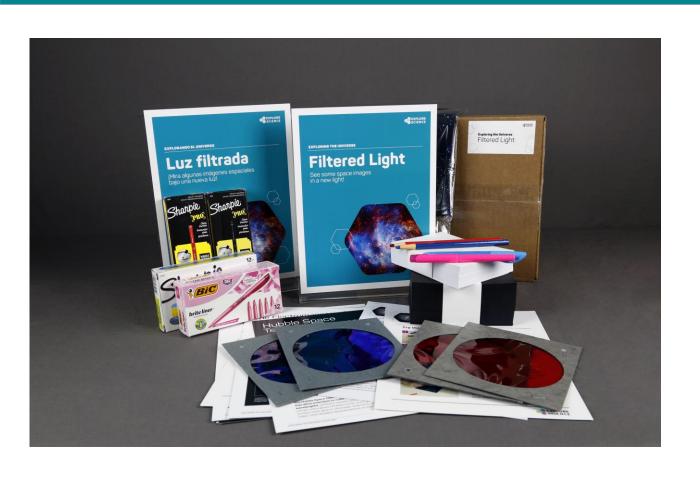


Exploring the Solar System: ExoplanetTransits





Exploring the Solar System: Filtered Light





Exploring the Solar System: Objects in Motion





Exploring the Solar System: Pack a Space Telescope



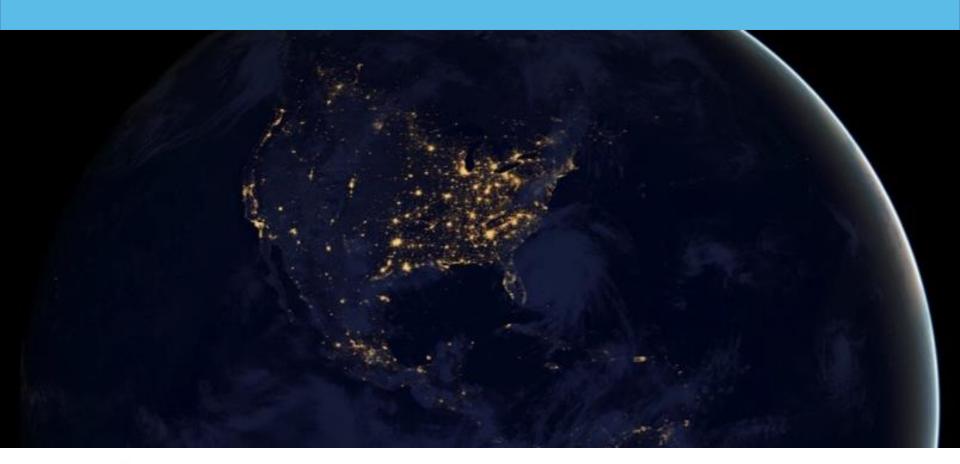


Events and Reporting



- If you received a physical toolkit
- Physical toolkit recipients are also required to complete an online survey report by June 15th, 2018.
- Reports will be shared this spring.

Thank You + Questions





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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the view of the National Aeronautics and Space Administration (NASA).

Questions

- 1. Share current plans or thoughts for your Explore Science: Earth & Space events, and discuss ways you might use the materials throughout the year.
- 2. What questions do you have for the development team about the activities or materials in the toolkit?

Upcoming NISE Net Online Workshops

All workshops 11am - 12pm PDT / 2 - 3pm EDT

The Science Behind the 2018 Toolkit – Earth and the Solar System

Tuesday, Feb 27, 2018

The Science Behind the 2018 Toolkit – Beyond the Solar System

Tuesday, Mar 13, 2018

NGSS and the Explore Science: Earth & Space Toolkit

Tuesday, Mar 20, 2018



Recordings of Past Online Workshops

All available at: nisenet.org/eventtype/online-workshop



ASTC CoP and NASA's "Universe of Learning" team at the Space Telescope Science Institute (STScI) is hosting a webinar series for informal science educators.

First webinar is tomorrow Wednedsay, Feb 7 at 2:00 p.m. ET

Register:

ttps://register.gotowebinar.com/register/487008173109424899





An engaging and interactive museum exhibition about Earth and space science for family audiences.







Application goes live Thursday February 8, 2018

http://www.nisenet.org/sunearthuniverse

Applications due May 1, 2018