Engaging families and young children in Earth & space science content

NISE
NATIONAL INFORMAL STEM EDUCATION NETWORK

NISE Network Partner Meeting
Tempe, Arizona - February 2019

EXPLORE SCIENCE
Earth&Space
www.nisenet.org

Session Organizers

- **Emily Belle,** Sciencenter (Ithaca, NY)
  ebelle@sciencenter.org

- **Michelle Kortenaar,** Sciencenter (Ithaca, NY)
  mkortenaar@sciencenter.org

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Presenters

- **Anna Hurst,** Astronomical Society of the Pacific, ahurst@astrosociety.org
- **Katie Julsrud,** Children's Museum of Eau Claire, katie@childrensmuseumec.com
- **Dawn Baldwin,** Children's Museum of Science & Technology, dbaldwin@cmost.org
- **Margaret Beswick,** Hawaii Children's Discovery Center, margo@discoverycenterhawaii.org
- **Stephanie Kadam,** Stepping Stones Museum for Children, stephanie@steppingstonesmuseum.org
- **Gina Anderson,** The Children's Museum of Green Bay, ganderson@gbchildrensmuseum.org
- **Anne Drake,** Great Lakes Children's Museum, adrake@glcm.org

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NATIONAL INFORMAL STEM EDUCATION NETWORK

Anna Hurst

Director of Museum, Parks & Library Programs

Astronomical Society of the Pacific

“My Sky Tonight”

www.astrosociety.org

Anna Hurst: ahurst@astrosociety.org


ORION

A Program from the Astronomical Society of the Pacific

www.astrosociety.org/MySkyTonight

My Sky Tonight is based upon work supported by the Division of Research On Learning (DRL) of the National Science Foundation under Grant no. AISL #1217441. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Overarching Goals of My Sky Tonight

Engage young children in *developmentally appropriate* astronomy activities

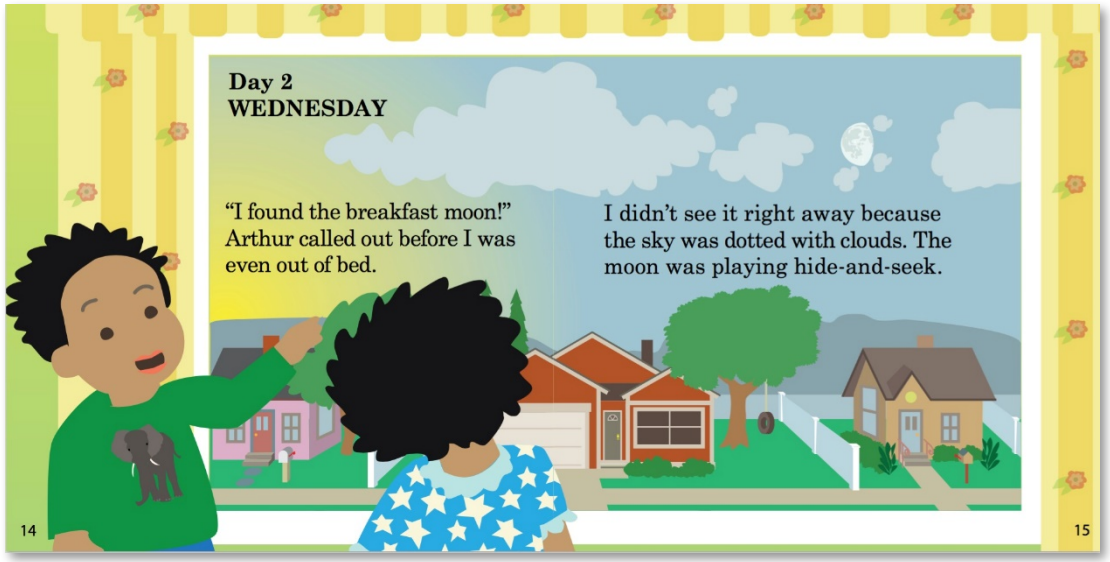
Engage young children in *science practices* as they investigate astronomy

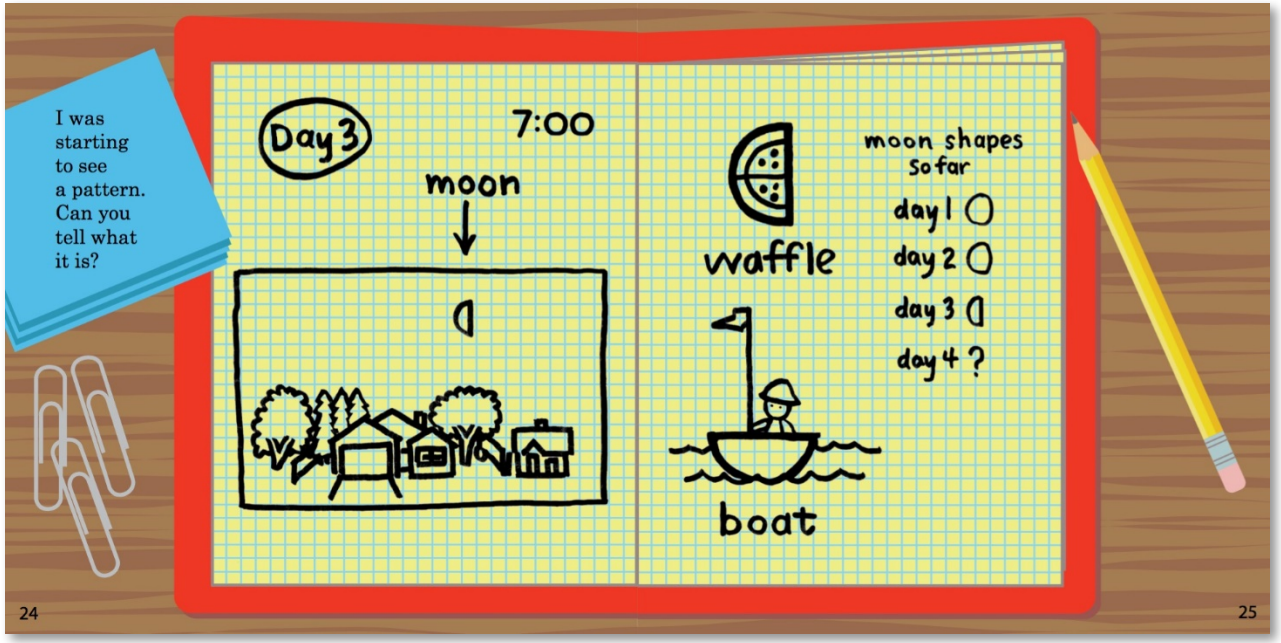
astrosociety.org/MySkyTonight


DONE


Xavier
Waning
(getting less)
The whole cycle of the Moon
from Full to New and back t
takes about a month.


BREAKFAST
MOON
Written by Meg Gower
Illustrated by David Barker


Day 2
WEDNESDAY
"I found the breakfast moon!" Arthur called out before I was even out of bed.
I didn't see it right away because the sky was dotted with clouds. The moon was playing hide-and-seek.
14
15


I was starting to see a pattern. Can you tell what it is?
Day 3
7:00
moon
waffle
moon shapes so far
day 1
day 2
day 3
day 4 ?
boat
24
25

A Program from the Astronomical Society of the Pacific

www.astrosociety.org/MySkyTonight

Anna Hurst: ahurst@astrosociety.org

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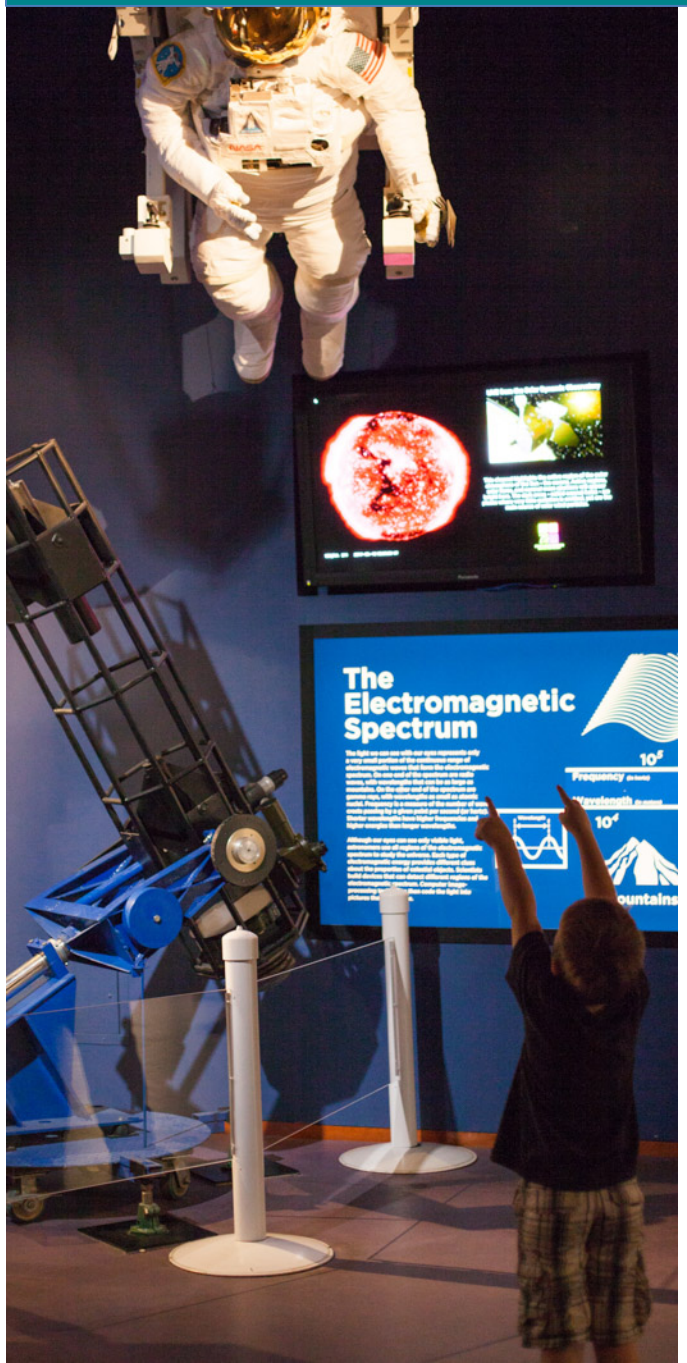


Katie Julsrud

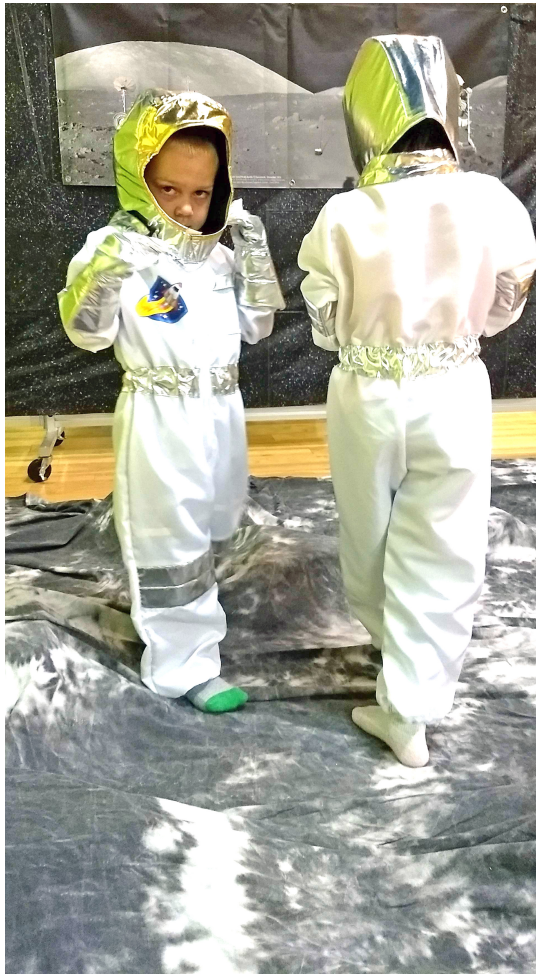
Director of Education & Outreach

Children's Museum of Eau Claire

Pop-up Programming
Inflatable Planetarium
Space Summer Camp

Space Quest!

Katie Julsrud -
Director of Education
+ Outreach



Fast Facts:

Located in Eau Claire, Wisconsin, the Children's Museum of Eau Claire serves children (and their grown-ups!) in West Central Wisconsin.

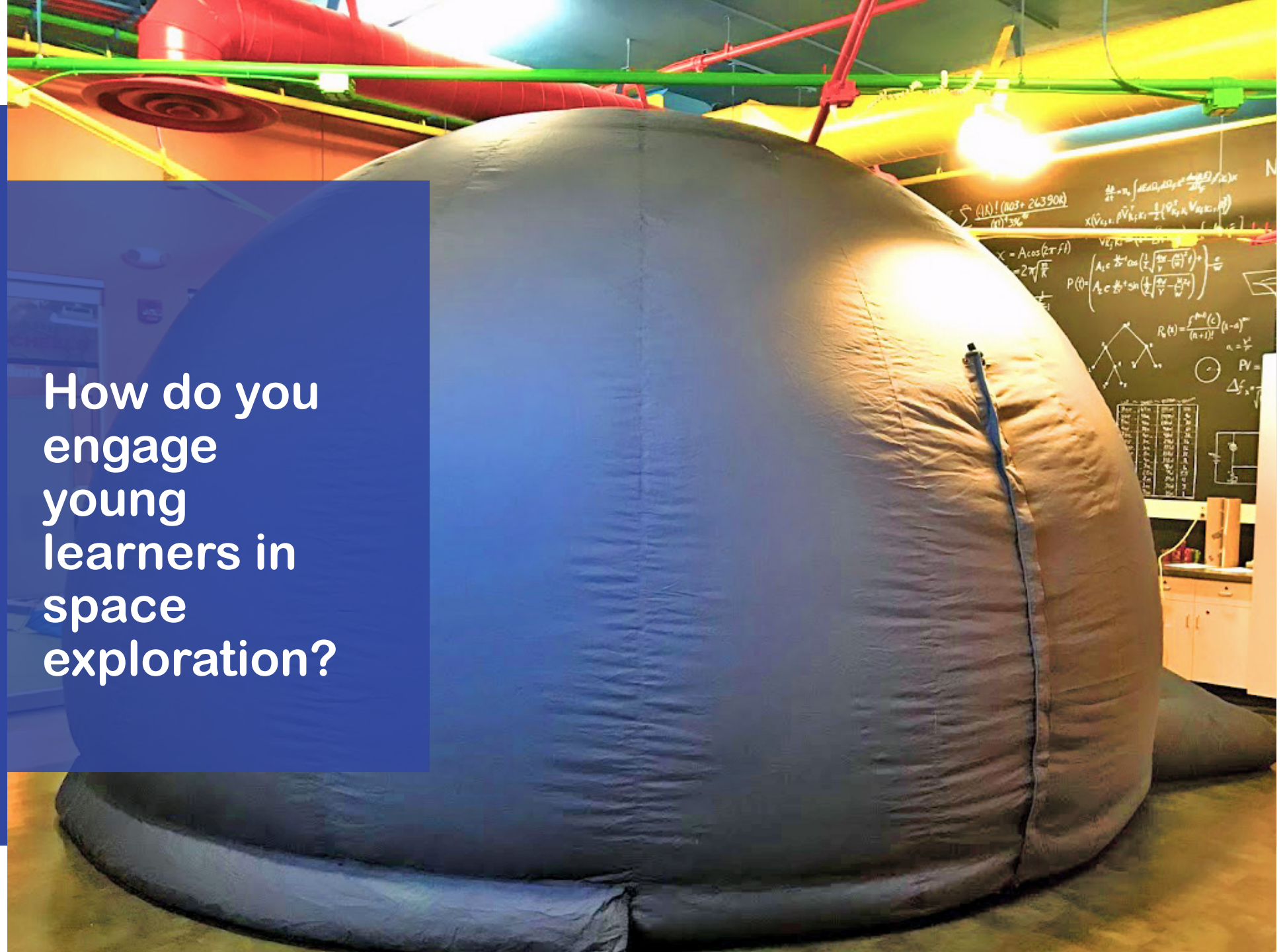
Our target demographic is children aged birth – 10 years old.

We will celebrate our 15th year of operation this December!

In 2018 we had an attendance rate of 78,222 total visitors.

Did you PLAY today?

A place to SEE, TOUCH, LEARN, and GROW!



How do you engage young learners in space exploration?


THIS MONTH:
CMEC
GOES TO
SPACE!
Full Museum
Programming

Make your own Comet!

You will need:

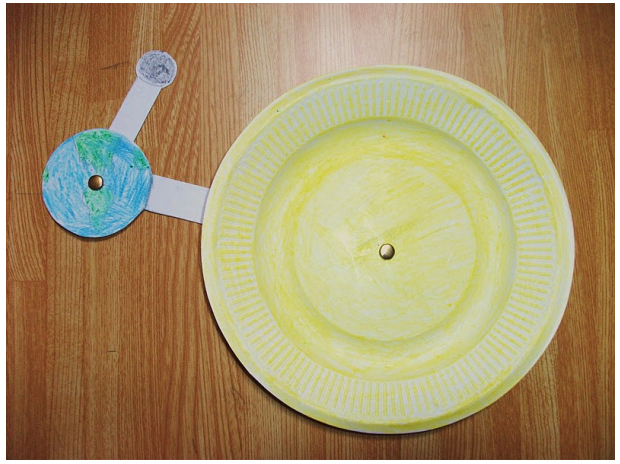
- 1 Popsicle stick
- 4 pieces of ribbon
- 2 pieces of tin foil
- tape (optional)

Directions:

1. Tie or tape ribbons around the top of the Popsicle stick.

2. Crumple tin foil in a ball around the top of the Popsicle stick covering the ribbons.

3. Fly your comet!

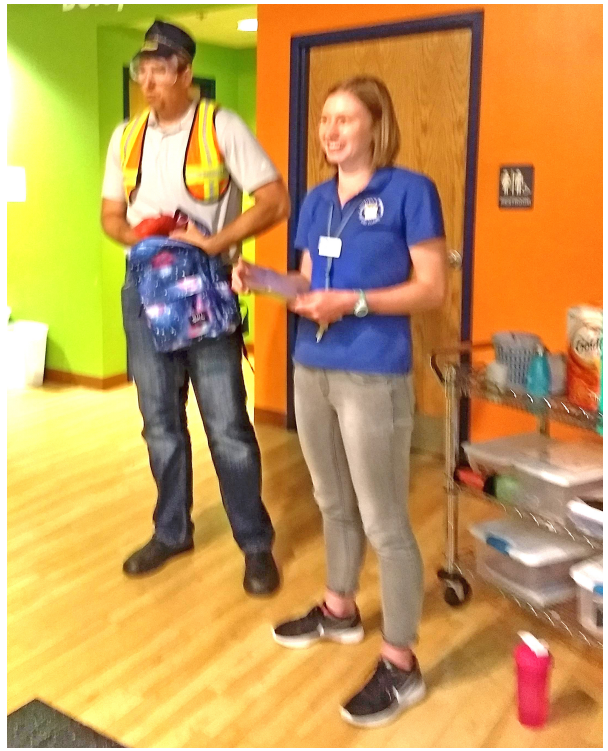


Camps for 4 year olds:

- Station activities
- Costumes
- Pretend Play
- Free explore time (approx. 20 min)

Snacks!
(Including Freeze Dried Ice Cream bars)

Staff



Details matter

ASTRONAUT
Emmeline

Thanks!

Katie Julsrud
Director of Education & Outreach

Children's Museum of Eau Claire

Dawn Baldwin

Education Program & Volunteer Manager

Children's Museum of Science & Technology

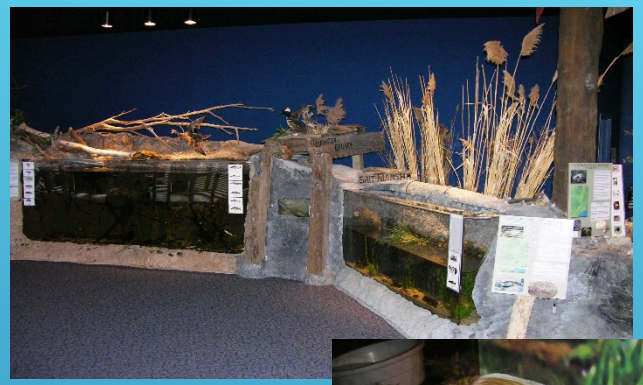
Themed Sensory Play


THE CHILDREN'S
MUSEUM
of Science and Technology

“To instill a sense of wonder and discovery in young minds, inspiring a lifelong exploration of science and technology”.

CMOST was founded in 1954 by the Junior League of Troy and was the first of it’s kind, in our area, “you can touch” museum to encourage active involvement of it’s visitors. True to our beginnings, all of our exhibit experiences continue to be designed with science discovery and play in mind. Our discovery environment provides children with the opportunity to investigate, observe, analyze, and build in a pressure-free setting.

The museum is designed specifically to engage children ages 18 months through the tween years and their caretakers. We provide prompts to foster creativity and invention, along with materials that encourage creative play. Our discovery environment provides children with the opportunity to investigate, observe, analyze, and build in a pressure-free setting.



CMOST is located in Troy, NY, just a short drive from the state capital. Our building is located in a technology park, and consists of 10,000 square feet of exhibit space and a small outdoor classroom. We also have access to a short trail and a small stream located on the property. We serve approximately 80,000 people a year, including visitation to the facility, group programs and outreach events.


Sounding Rockets
Cohetes sonda


EXPLORING THE UNIVERSE
Filtered Light
See some space images in a new light!

- In order to engage our youngest visitors, we find we must engage the adults and older siblings.
- Activities for younger visitors need to be facilitated.
- Don't be afraid to do what you do best. It will add to each experience.
- Substitutions and additions are OK and sometimes necessary based on your visitors.
- Make things so much fun that they forget they are learning!
- Silly is a good thing.

Margaret Beswick

Science Programs Coordinator

Hawaii Children's Discovery Center

Incorporating the Arts

Cultural Relevance & Cross-cultural Learning

ALOHA!

The Hawaii Children's Discovery Center is a world-class learning environment that is filled with hands-on interactive exhibits that empower and inspire children to learn about themselves and the world through exploration and play. We are the only children's museum in Hawaii and are located in the beautiful Kaka'ako Waterfront Park. Opened in 1998 at our current location, the museum is 45,000 sq.ft. and has 5 galleries, 3 classroom spaces, and an outside courtyard. We are a private non-profit that sees about 125,000 visitors annually.

Makerspace: Sparking Family Curiosity

On the weekends we have the Makerspace open for families to learn and play together.
Earth and Space Science we have done with 3- 5 year olds:

- Imagining Life- We invited children to use upcycled items to construct their own alien.
- Investigating Clouds- We invited children to create their own weather satellite using upcycled items.
- Integrating art and sensory projects into the activities provided helped to engage our younger visitors. Activities such as space themed playdough are a huge hit.

Makerspace and Beyond: Families Sharing Together

- With the Hide and Seek moon activity we gave many parents and caregivers a chance to share their own culture's stories of what they see in the moon.
- We have many families that visit the center who have immigrated recently or in the past several generations from Japan, China, the Philippines, and many other places and we work to integrate cultural learning along with science in our activities as a way of creating cross-generational bonds.

Preschool Camps

With Preschool camps we strive to do more and say less! Our recipe for success includes:

- We integrate movement into lessons such as kinesthetic astronomy and trying out things astronauts do.
- We incorporate imaginative play such as creating a giant cardboard rocket and drawing buttons inside.
- Given the high diversity of our audience we start with familiar cultural practices and add in scientific content.
- One of the best activities we did was pounding rice to make mochi and reading or saying the Japanese story that explains the rabbit pounding mochi visible in the moon, then learning about craters.
- As with the Makerspace programs incorporating art with science content is key for keeping the younger children engaged.

Discovery Camps

The campers are between 5-8 years old. However many of the activities would be appropriate for younger children, especially with caregivers and children working together.

- When studying the solar eclipse we set up stations to learn about the eclipse in multiple ways. Campers rolled an earth, a moon, and a sun out of playdough, used the earth moon and flashlight from the solar eclipse kit, and created their own solar eclipse viewers. We created mixed media models of the eclipse. Finally we discussed the connection between shadows and eclipses and went outside to trace a friend's shadow.
- After trying the Investigating Cloud activity we mixed together shaving cream and glue to create puffy cloud paint.
- After trying the Pocket Solar System we painted our own solar system.

STEM Lab

Our Preschool STEM lab is a part-time preschool for children 4-5 years old. In August 2018 our theme was space.

- To study gravity we first gave the kids a balloon and had them try to blow it towards the ceiling with a straw. Then we used the same straw and made a rocket to fit over it to blast off. The children observed it rise with air and fall with the force of gravity.
- One day we focused on the sun. We talked about the idea that the sun gives us light – which is energy and, some of the energy from the sun is invisible ultraviolet light. We explained that we can see the UV light by using some tools. We made UV bead bracelets and sun prints on photosensitive paper.
- We learned about the universe and how matter exists in different states in the rest of the universe just as it does on earth. We got out our plasma ball and tried it out. We did an experiment with solids, liquids, and gases. We mixed orange juice with baking soda and watched carbon dioxide bubbles form and bubble up.

Moving Forward

- We are excited to continue to implement earth and space science content. Over the next year we will have several space themed camps. We will also continue to cover earth and space science with a wider audience through gallery programs.
- In all of our camp and our STEM program we will continue to send children home with a journal and projects so they can share with their families what they have learned in each class.

HAWAII CHILDREN'S DISCOVERY CENTER

Stephanie Kadam

Senior Manager of Exhibit Content Development

Stepping Stones Museum for Children

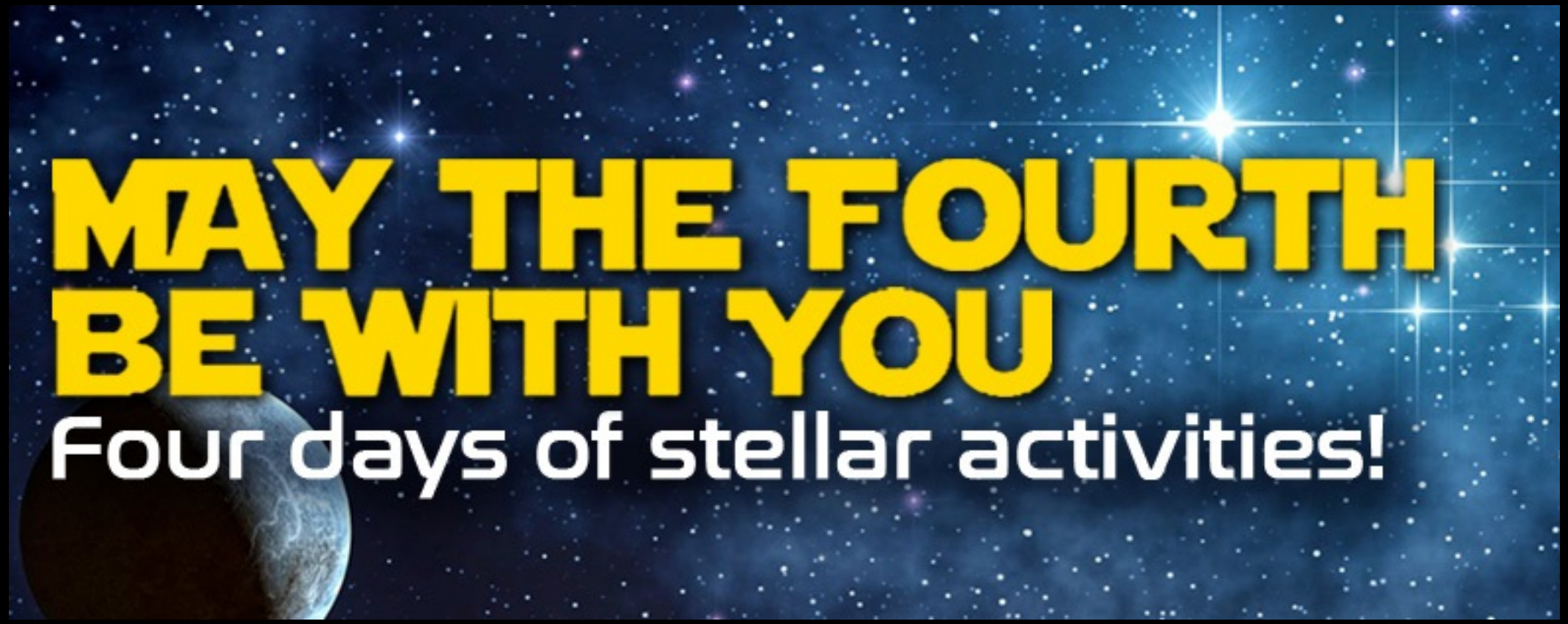
Using Pop Culture

Stepping Stones Museum for Children

Children's museum in Norwalk, CT

Children 10 years and younger and their families

The content of our exhibits and programs focuses on literacy, health (including social and emotional), culture, arts and STEM


MAY THE FOURTH
BE WITH YOU
Four days of stellar activities!

Bear’s Shadow

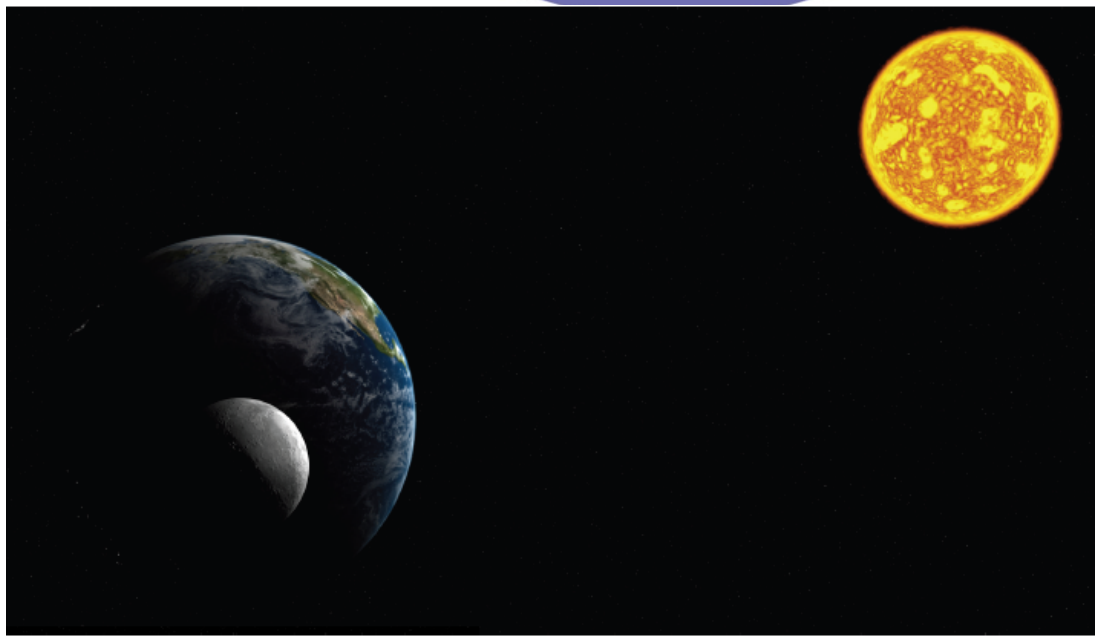
Stepping Stones Museum for Children

Shadows on Tatooine

Does a droid's shadow look different on Tatooine than it would on Earth? Explore the phenomena of shadows in a two star system versus a one star system.


Four days of stellar activities!
Shadows on
Tatooine

Orbiting Objects



Gravity keeps the Moon in orbit around Earth, and Earth in orbit around the Sun.

Stepping Stones Museum for Children

The Moons of Endor

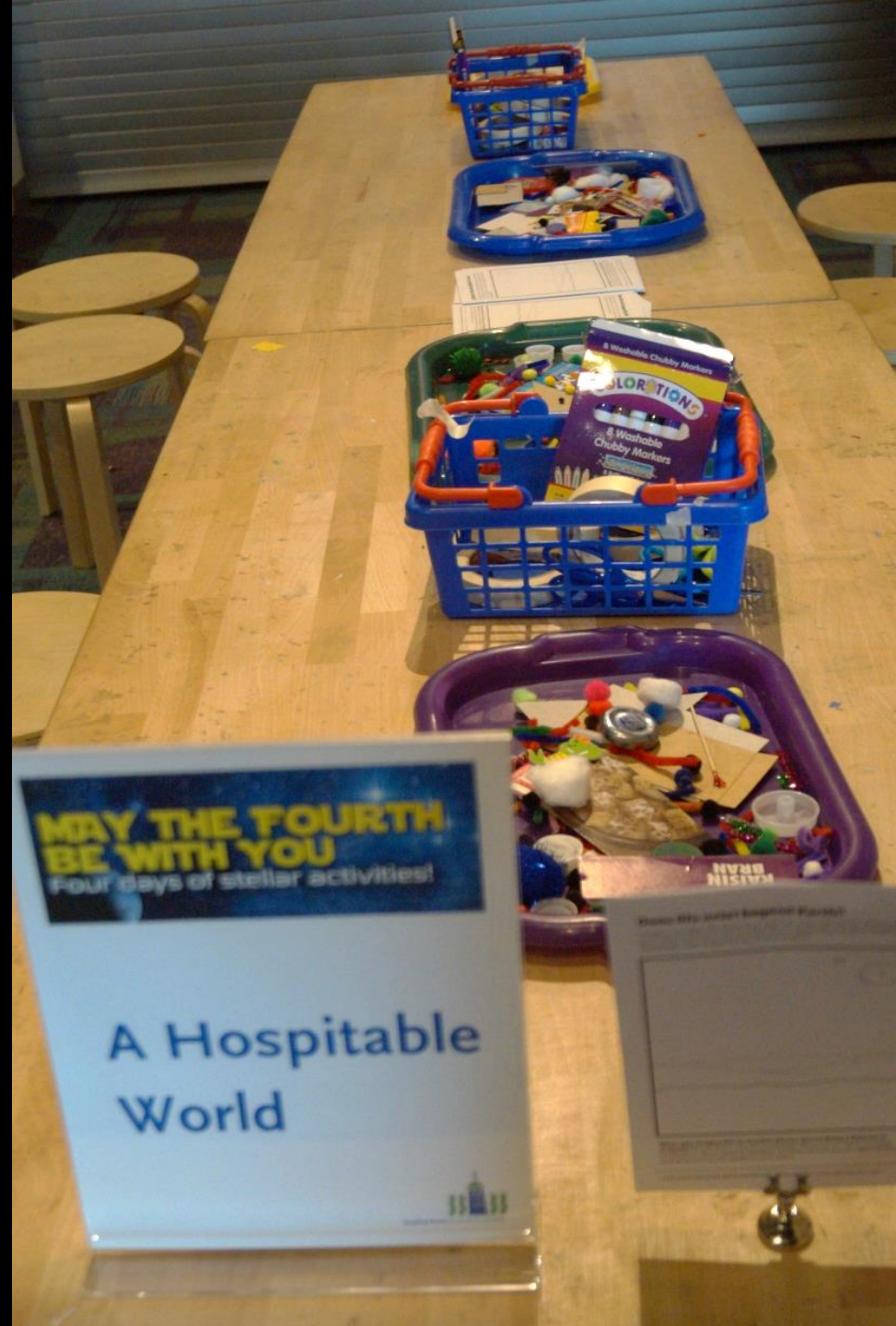
Ewoks live on a forest moon that orbits Endor, a giant gaseous planet. Learn how the forest moon and the eight other moons are affected by Endor's gravity and what keeps them circling the planet.

Imagining Life

Stepping Stones Museum for Children

A Hospitable World

In the Star Wars world, all the characters are able to coexist in the atmospheres of the planets and the ships. Can you imagine a creature that would live on a planet that is very different from earth?



Pocket Solar System

Stepping Stones Museum for Children

Engage the Hyperdrive

Just how far away is Saturn?
How long would it take to get there?
Find out why Han Solo relies
on his hyperdrive.

How long does it take to get to other planets?

The table below shows the time it takes light to travel from the sun to the different planets (and Pluto). Without faster-than-light travel, the Millennium Falcon would not be able to travel from planet to planet in Han Solo's lifetime.

Planet	Distance (AU)	Travel time
Mercury	0.387	3.2 min
Venus	0.723	6 min
Earth	1.000	8.3 min
Mars	1.523	12.6 min
Jupiter	5.203	43.2 min
Saturn	9.538	79.3 min
Uranus	19.819	159.6 min
Neptune	30.058	4.1 hrs
Pluto	39.440	5.5 hrs

* times may vary depending on the orbit of the planet

Stepping Stones Museum for Children

Other Adaptations

Big Sun, Small Moon and Solar Eclipses → Death Star Eclipses

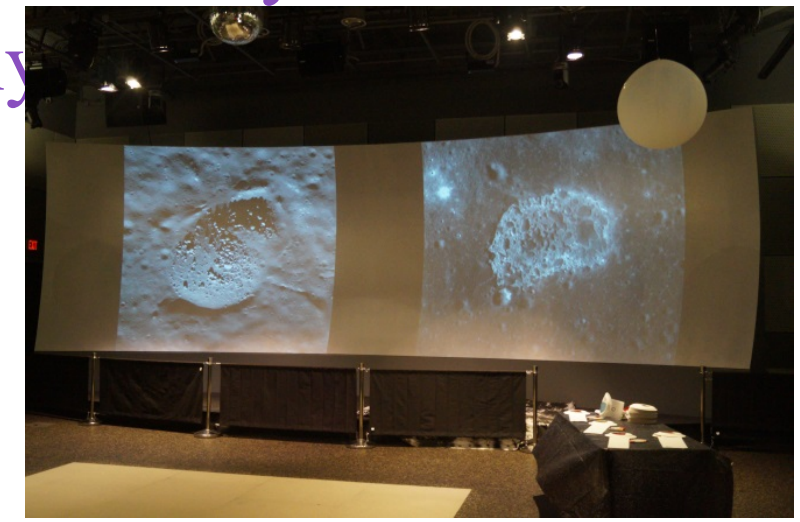
Did the Empire choose a good location to build ultimate weapon, the Death Star? Find out why orbiting the planet Geonosis may thwart their evil plans.

Stepping Stones Museum for Children

Other Adaptations

Lunar Landscape → In a Galaxy Far, Far Away…

Create and gather equipment that you would need to use while alaxy



Stepping Stones Museum for Children

Other Adaptations

Rising Sea→ Swamps of Naboo

The Gungan inhabitants of Naboo may not mind if water levels were rising, but the Naboo might! Learn how rising sea levels are affecting our world and how scientists keep track of the water levels.

Stepping Stones Museum for Children

Other Adaptations

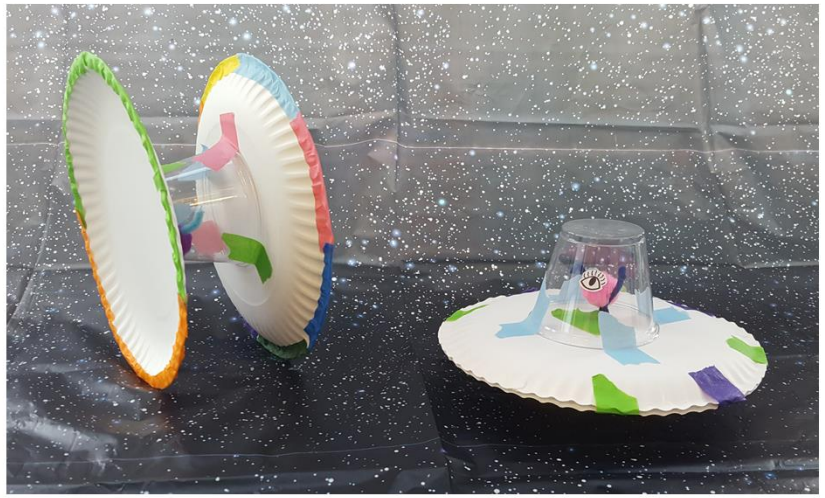
Creating Craters → Crater Field

The How are craters formed? Make a field of craters to find out! Your crater field will not be big enough to hold a podrace like the Boonta Eve Classic, but it will help you learn about these features found on Earth, the moon and other planets.

Stepping Stones Museum for Children

Paper U.F.O.

Make a UFO using everyday household items that will rival the Millennium Falcon!



Stepping Stones Museum for Children

Martian Slime

Create your own slime inspired by Jabba the Hutt.

Stepping Stones Museum for Children

Rocket Science

Build and launch your own rocket
with a Chewbacca sized stomp!

Stepping Stones Museum for Children

Nebula Space Jars

Make a galaxy that fits in a in a jar.

Recommended for ages 4 and older.

Stepping Stones Museum for Children

Jedi Forces

Channel your inner Yoda and master invisible forces like static electricity and gravity.

Recommended for ages 3 and older.

Stepping Stones Museum for Children


STAR
WARS


The Mood Meter
EXIT
ALACIOUS
CRUMB

Gina Anderson

Programs Manager

Children's Museum of Green Bay

Monthly Science Saturdays

The Children's Museum of Green Bay

Green Bay, Wisconsin

- Located in the heart of downtown Green Bay
- Opened since June 2012
- Average of 68,000 visitors per year
- Provides learning through play experiences for families with children ages 2-10.

A place where children play to learn and adults learn to play.

The Children's Museum of Green Bay

Programming

Monthly Science Saturday program

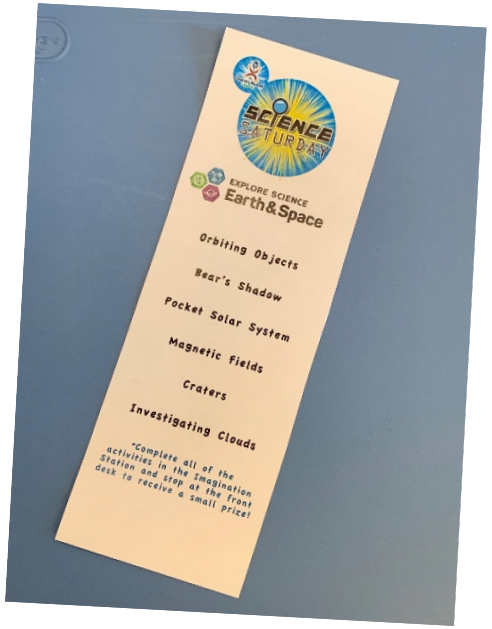
- Science stations set up around the museum with activities run by volunteers on one Saturday morning per month
- Each month revolves around a different science topic or theme
- Many months have utilized NISE Net materials

The Children's Museum of Staten Island

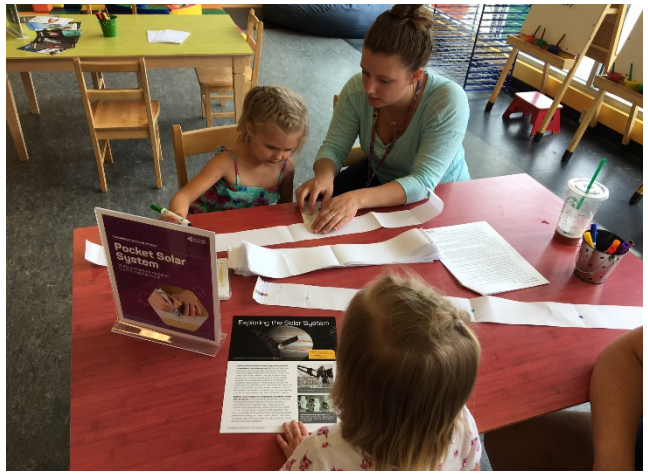
SCIENCE SATURDAY

Explore Earth & Space Science Saturday

- Children receive a passport to visit up to 6 science stations with different activities/experiments.
- Families visit the stations at their leisure.



- Volunteers are trained on their activity before the event.
- Children receive a small prize for completing all stations.
- These events drive attendance!



Why is this programming important?

- **Why do we feel that this type of monthly program is important?**

- It engages children and adult caregivers with hands-on learning, in a playful and non-threatening way.
- Aligns with our mission to explore, create, conquer fears, develop confidence, and master the world around them.
- Allows for scaffolding, making the activities developmentally appropriate for various ages.
- Exposes families to new topics to heighten interest and awareness.

Anne Drake

Museum Educator

Great Lakes Children's Museum

STEM Countdown – Activity Calendar

The Great Lakes Children's Museum

Play To Learn. Learn To Play.

About Us:

Located in Traverse City, MI

Thirty Five Thousand Visitors per year.

Gallery Space: 3000 Sq. Feet

Funded by Admissions, Memberships, Grants and Donations.

Currently 495 Members.

½ of all visitors are subsidized.

Educational Offerings:

Interactive Story Time
Discover With Me
Get Crafty
Maker Space Monday
Summer STEAM
Arts In Action
Partner Programs

Events:

Members Nights
Energy Bus
Peace Day
Daddy Daughter Dance
Spring Break Science
Earth Day Explorations
Kids Free Fishing Day
Cherry Festival Activities
Kids T C Film Fest Activities
Children's Art Fair
Museum's Annual Birthday Celebration
Children's Vision Day
Holiday Break Specials
Draw NoMI
Countdown to Noon

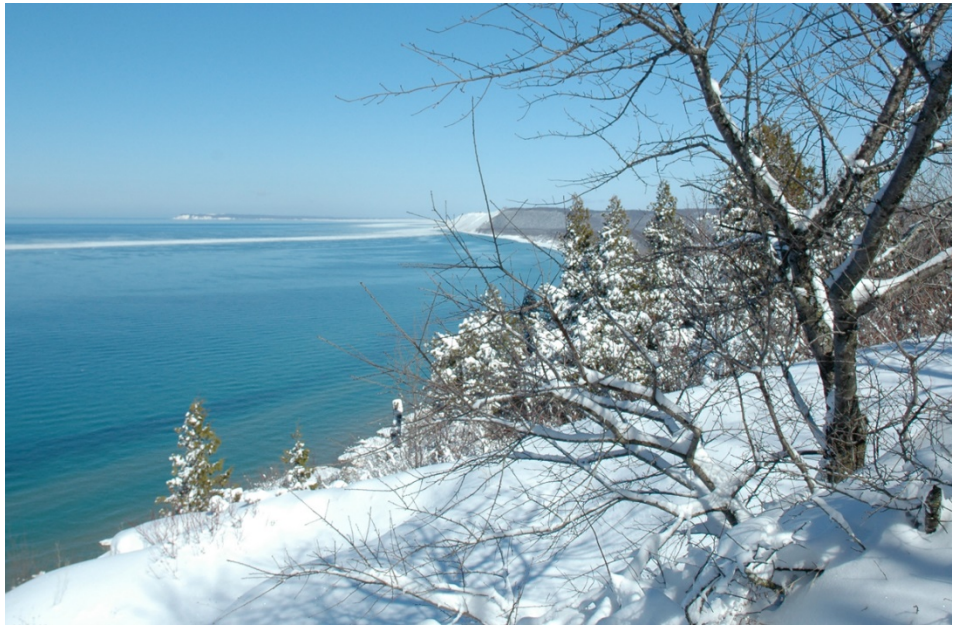
Metro Rural

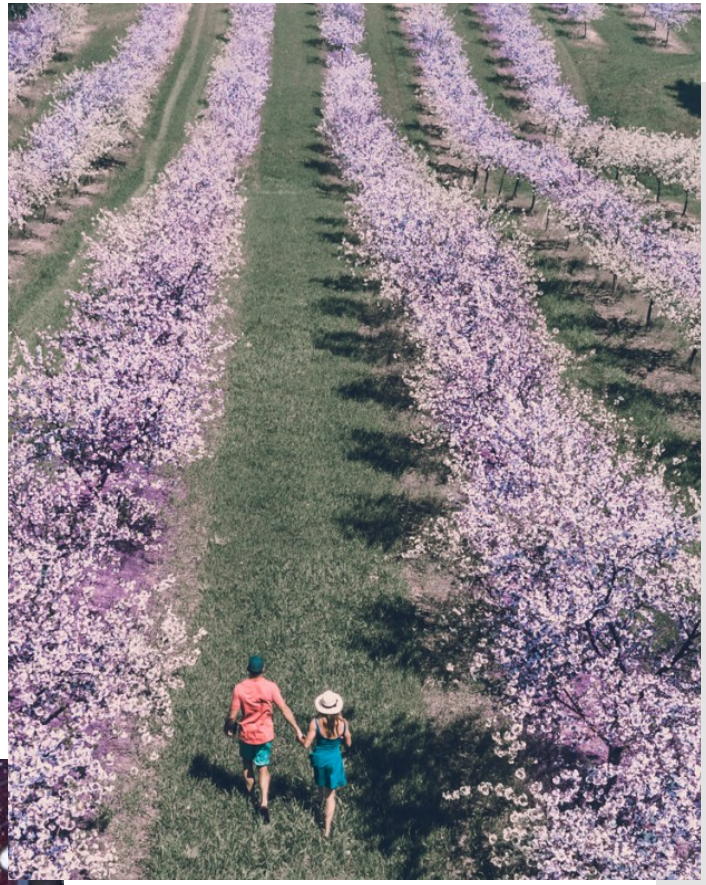
Traverse City is:

A travel destination city rich in water and natural wonders.

Surrounded by agriculture and wild areas.

An area hub for technology and art.





Holiday STEM Challenge!

Investigate like a Scientist.

Invent like a Technologist.

Fabricate like an Engineer.

(Imagine like an Artist,)

Solve problems like a Mathematician.

. . . And Play together this Holiday season

Holiday STEM Challenge

Celebrate A Season of Holiday Science, Technology, Engineering and Math.

1. Holiday Maker Kit

Start the season by giving your child a workshop in a box. Fill a shoebox with materials your child can use to invent, engineer and build their ideas and homemade gifts.

2. Jumping Tinsel

Static Electricity Experiment

Rub a balloon over your hair. Pick up pieces of tinsel. Find out what happens. Experiment with different sizes of tinsel. What else will the balloon pick up?

.4. Magnetic Magic Ornaments

A. Put small metal objects in clear fillable plastic ornaments . (paper clips, jingle bells, nuts, bolts) What will a magnet attract?

B. String nuts, bolts and washers, along with plastic beads onto a colorful pipe cleaner. What will the magnet stick to?

5. Needle Nose

Scratch and Sniff

Go outside and collect several different kinds of tree needles. Scratch each one and compare. Do they all smell the same?

Countdown Calendar

Encourage and support families learning together.

Provide a play based STEM opportunity

Keepin' It Simple!

Activities included had to use supplies commonly found at home.

Selected activities could be carried out with limited mess.

Ways To Play!

How we made this resource available to families.

In house advertising with physical copies available at museum

Daily activities posted on the museum's Facebook page and website.

Posted on UpNorth Family 29& 8 Facebook page.

Promoted multiple times on UpNorth Family News Cast

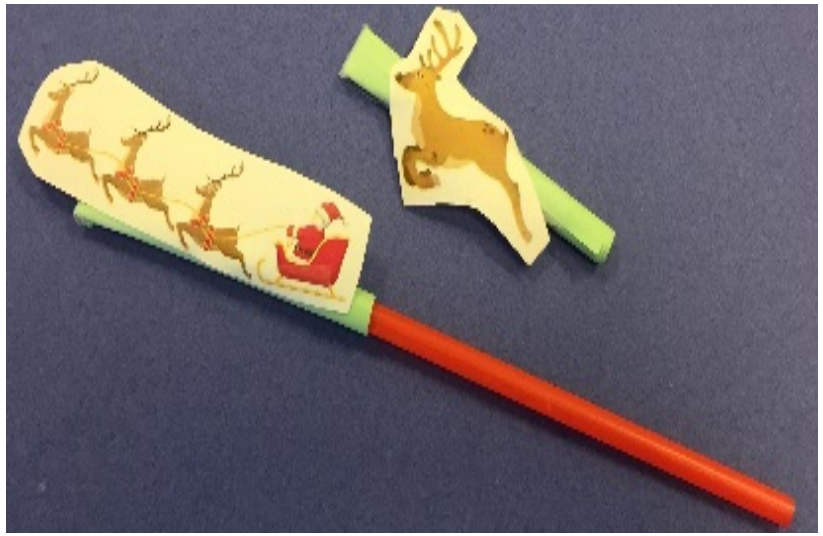
What We Learned

Need to increase multi-culture appeal

Out door activities may have excluded some families.

Need to make the Resource Pages more comprehensive.

Provide a possible incentive for families who complete the challenge.



Children's Books & Activity List

https://docs.google.com/document/d/1QY4h0ApQPVfnAQCgREPulat-jbALpE6xwfNe-XXX7wc/edit?usp=sharing

GET INVOLVED

Learn more and access online digital library:

nisenet.org

Monthly newsletter
nisenet.org/newsletter

Social networking:
nisenet.org/social

http://www.nisenet.org/2019-partner-meeting

Thank You

NISE NATIONAL INFORMAL STEM EDUCATION NETWORK

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