

Little Cli-Mates

Small Changes for a Big Difference

May 18, 2022



Today's Presenters:

Frank Kusiak, Lawrence Hall of Science

Amber McCammon, The Virgin Islands Children's Museum

Lauren Butcher, Explora Science Center and Children's Museum

Rebekah Domayer, Iowa Children's Museum



Session Overview

12:45-12:55: Session Introduction

12:55-1:15: Successful Programs

1:15-1:30: Heuristics/Metaphors for Climate Communication

1:30-2:00: Table discussions/Report out

Communicating Climate Change: Resources

NISE Net's Climate Change Resource page: Climate Change

<https://www.nisenet.org/climatechange>



A compilation of climate change public engagement and professional learning resources for informal science educators.

Climate Change

Online digital libraries of educational materials

- CLEAN collection of climate literacy and energy education materials: <https://cleanet.org>
- NOAA Climate.gov: <https://climate.gov/teaching>
- MADE CLEAR: <https://madeclear.thinkport.org>



Communicating Climate Change: Resources

- **NASA's Climate Change Science Page** - <https://climate.nasa.gov/>
- **NOAA The Essential Principles of Climate Literacy and CLEAN's Guide to Teaching About Climate Change** - <https://www.climate.gov/teaching/climate>
- **New Hand to Hand: Children's Museums and Climate Change:**
<https://childrensmuseums.org/2022/03/17/new-hand-to-hand-childrens-museums-and-climate-change/>
- **Design & Discovery Forum on Climate Science, Children, and the Media:**
https://www.nsf.gov/news/news_summ.jsp?cntn_id=304714&org=EHR

Communicating Climate Change: Resources

- **National Network for Ocean and Climate Change Interpretation (NNOCCI):**

<https://climateinterpreter.org>

- **NNOCCI resources:** <https://climateinterpreter.org/resources>

- NNOCCI and Frameworks Institute reframing cards for creating effective climate communication
- NNOCCI swamp graphic showing effective messaging language: productive (green), proceed with caution (yellow), and unproductive/avoid (red)
- Recommend NNOCCI's Crash Course for Communicating Climate Change
<https://climateinterpreter.org/training>



Overview of NNOCCL's and Framework's Work

3 Things to Focus on

1) Tested Metaphors to Communicate Climate Change

CO₂ acts like a blanket

2) Tested Values to Facilitate Meaningful Conversations

Protecting people's safety and wellbeing

3) Keep it Local: Using Local Solutions/Issues about Climate Change

What does your community care about?



Amber M. McCammon
VICM Programs Director & Curator

Communicating Climate Change to Diverse Audiences in the VI



- Diverse cultures
- Indigenous peoples
- Multiple languages
- Different grade levels/ ages/ abilities

VI Children by Race/Ethnicity, 1990-2015

Year	Black	Hispanic (any race)	Other Races	White
1990	83%	15%	10.2%	6.8%
2000	82%	15%	11%	7%
2014	83%	16%	12%	5%
2015	86%	18%	9.6%	4%

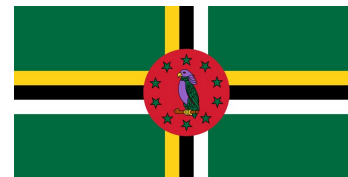
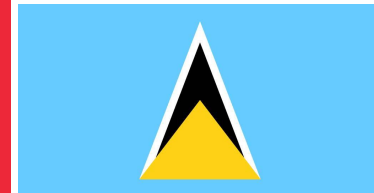
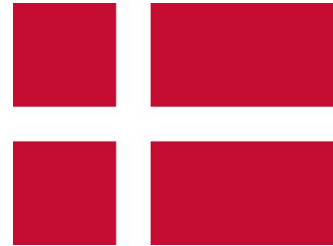
**Note: Population measures VI children age birth through 19 years old.*

"Other races" may include the following: Hispanic, Asian, Middle Eastern, East Indian, or a mix of any races.

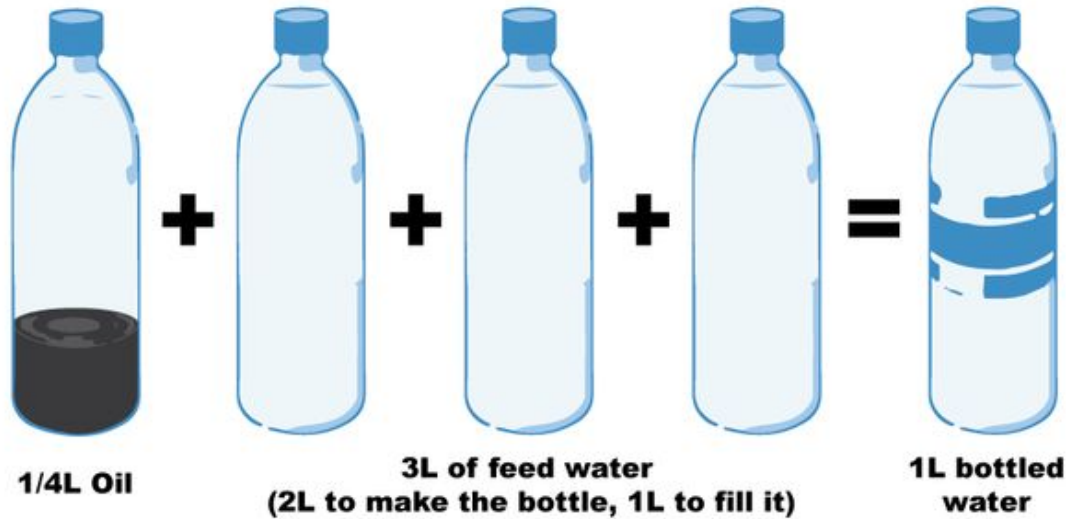


- 75% of children spoke only English in their home.
- Of those children who spoke another language in their home, Spanish made up the majority (65% of children for whom another language was spoken), while French/Patois/Creole followed (28%), and "other languages" combined to make up a small percentage (7%).

Many Nationalities:



Infographic Signage



- Water is a valuable resource
- Issues
- Solutions
- Call to Action
 - Refill your bottle!



HYDRATION STATION

DO YOU KNOW WHAT'S IN YOUR BOTTLED WATER?

Hazardous Chemicals

3L of Feed Water (2L to make the bottle, 1L to fill it)

1/4 of Oil

One-million plastic bottles every minute with 90% of all plastics ending up in the ocean after just a single use.

REASONS TO SWITCH TO REUSABLE WATER BOTTLE

- **The carbon footprint** to produce bottled water is unfathomable.
- **99.9999%** bacteria-free.
- **BPA** often found in disposable water bottles. It can disrupt hormonal function in humans and impact brain development in fetuses and young children.

ISLAND DESIGNS
VIRGIN ISLANDS
VICC
VIRGIN COASTS
VICS
VIRGIN ISLANDS CONSERVATION SOCIETY

Refuse, Reduce, Reuse... Recycling is the last resort!

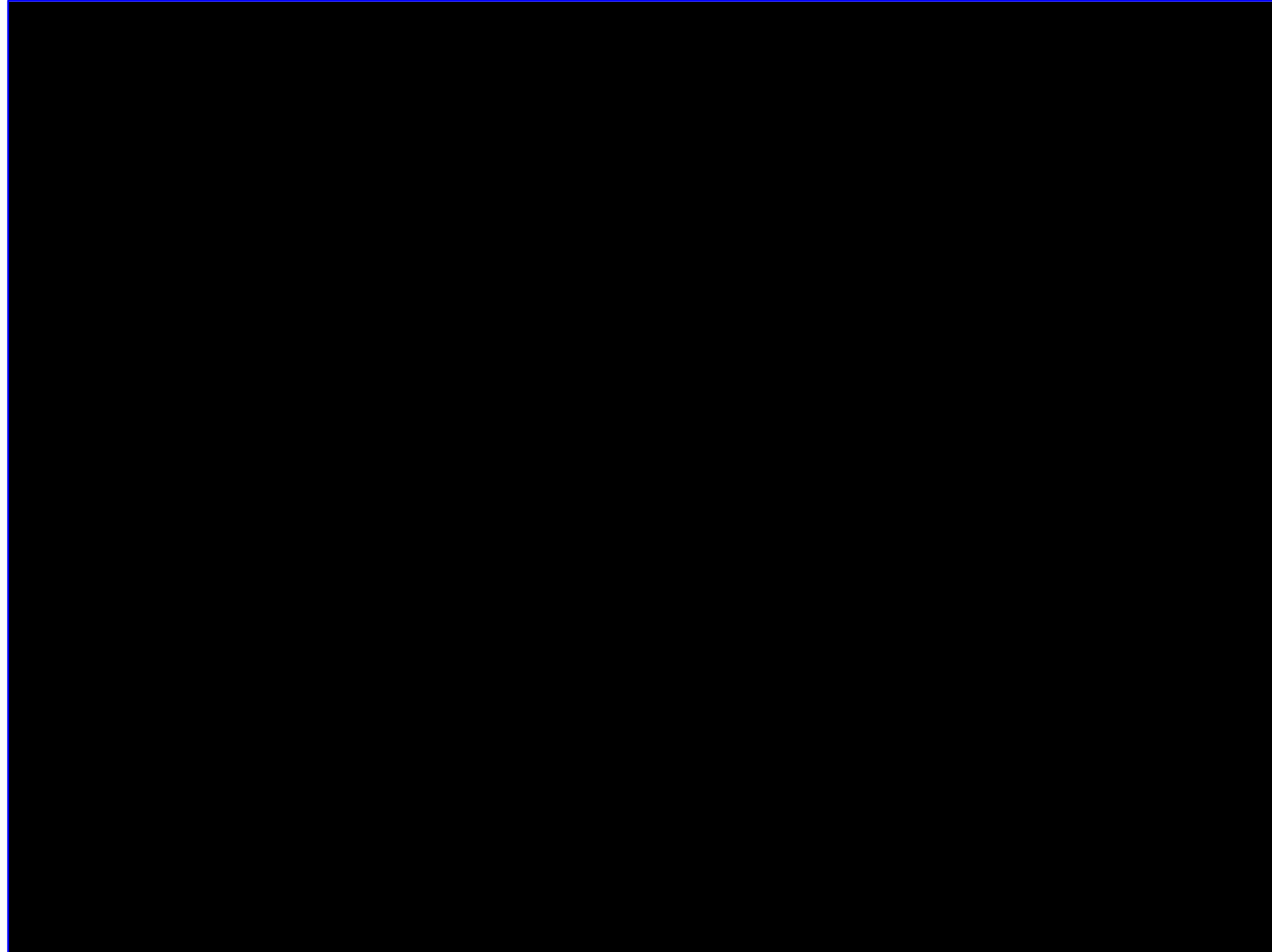
Lead by Example

Recycling and 3D Printing Room

- All visitors can watch recycling and new product production in action
- Currently limited signage with more infographics coming soon

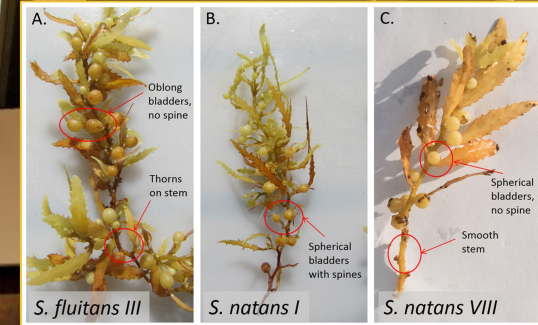
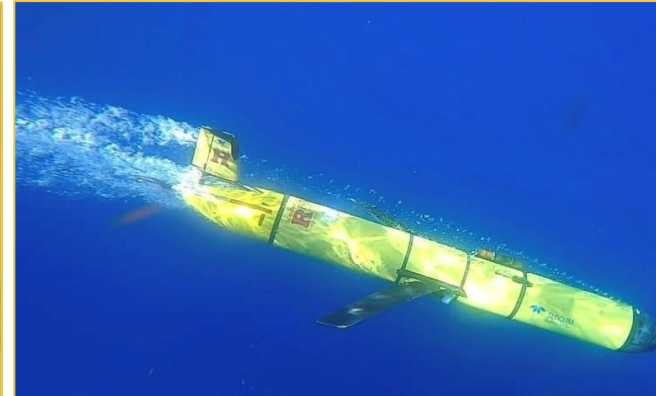


Audiovisual Touch Screen Kiosk Curated by Grade Range



Coastal Ocean Observing Learning Station - COOLS

Audiovisual, Multilingual Closed Captioning & ASL Transcription



COOLS Feature ~ Sargassum Stories Infographic Signage

- Biophysical impacts
- Socioeconomic impacts

- Glider
- Interactive Videomicroscope



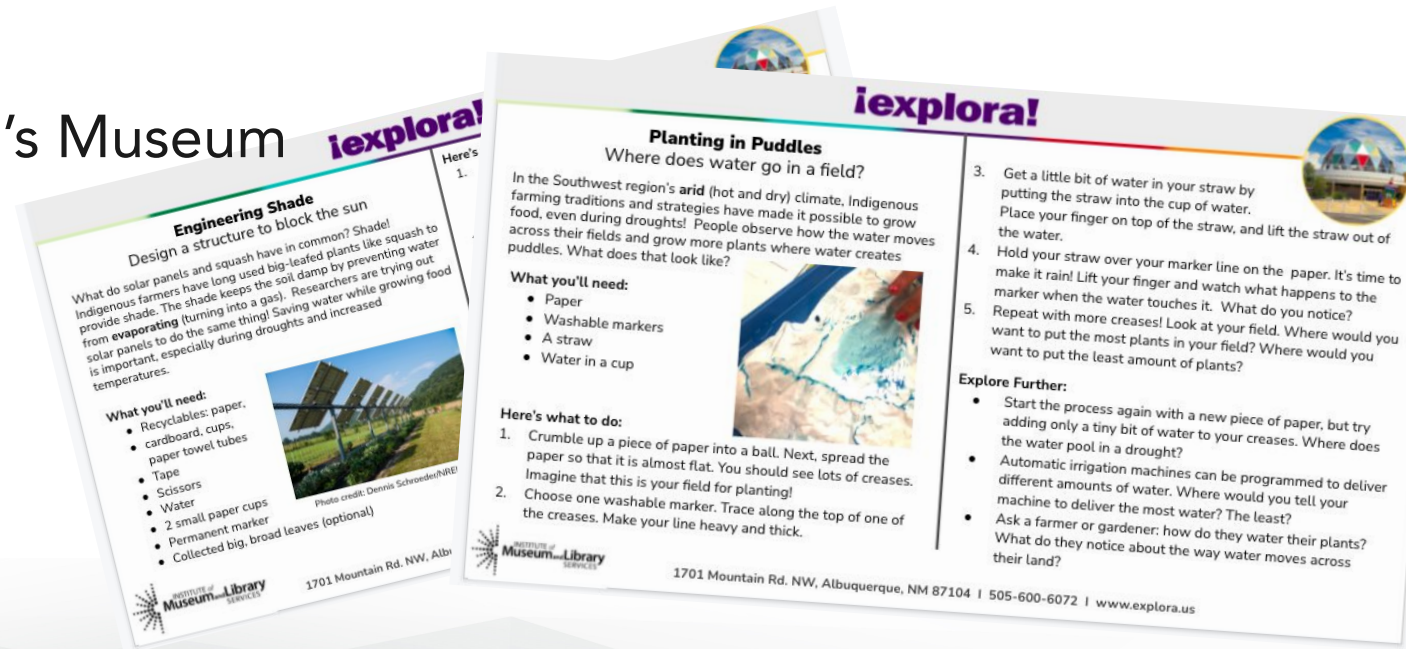
THANK YOU!

Amber M. McCammon
VICM Programs Director & Curator
amber@vichildrensmuseum.org
<https://www.vichildrensmuseum.org/>



Climate Change STEM Activity Cards

Lauren Butcher
Explora Science Center and Children's Museum





Climate Change STEM Activity Cards

- Communicate how Traditional Ecological Knowledge and practices address the effects of climate change
- Small cards with at-home STEM activities for caregivers and children



Waffle Garden Design

How can you grow food with less water?

Indigenous farming traditions and strategies have made it possible to grow food in the Southwest region's **arid** (hot and dry) climate for a very long time, even during droughts! Zuni people **conserve** (save) water by using a "waffle" garden. How does this method work?

What you'll need:

- Some ground to dig in
- Gravel or mulch or sand
- Water



Photo credit: Library of Congress

Here's what to do:

1. Remove plants, twigs, and rocks from an area about the size of your hands side-by-side with your fingers spread wide.
2. Use your finger to draw a square in the cleared area. Dig down about 3 to 4 inches inside the square.
3. Use the soil you remove to make walls along the edges. Add a little water to make the soil stick together.

4. Put some gravel, mulch, or sand in the bottom of your square. Repeat to make a grid.
5. Carefully pour water into the inside of your walls. What do you notice? Where does the water go? How much can you add?
6. Check underneath your gravel, mulch, or sand a little later. Is it still wet? What about the next day?

Explore Further:

- Experiment with the height of the walls and depth of the square. What happens to the water inside?
- Try different **soil compositions** (proportion of sand, clay, and humus). What builds the sturdiest walls?
- Explore different amounts of gravel, mulch, or sand. Does the water stay in the ground longer with a larger amount of material?
- Ask a farmer or gardener: How do they conserve water and keep moisture in the soil?
- Do you have a drought in the area where you live? What are ways you can conserve water?

Read: Visit the library and check out *It's Our Garden: From Seeds to Harvest in a School Garden* by George Ancona

iexplora!

Origins: Working with and for Native communities in NM



iexplora!



Foundation:
Traditional Ecological Knowledge from the past and for the future



Kirk Bemis, hydrologist for Zuni Water Resources
Photo credit:
<https://features.weather.com/praying-for-rain/>



Zuni, New Mexico. Photo credit: ashiwi.org

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Process:

- Interviewed experts in Traditional Ecological knowledge and practices
- Highlighted science and engineering practices
- Referred to the past and the present
- Where relevant, included complementary STEM research

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Example: Three Sisters and Solar Panels



Three
Sisters.
Photo credit:
[https://sciences.ucf.edu/
news/farming-with-traditi
onal-compa
nion-plantin
g/](https://sciences.ucf.edu/news/farming-with-traditional-companion-planting/)



Engineering Shade

Design a structure to block the sun

What do solar panels and squash have in common? Shade! Indigenous farmers have long used big-leafed plants like squash to provide shade. The shade keeps the soil damp by preventing water from **evaporating** (turning into a gas). Researchers are trying out solar panels to do the same thing! Saving water while growing food is important, especially during droughts and increased temperatures.

What you'll need:

- Recyclables: paper, cardboard, cups, paper towel tubes
- Tape
- Scissors
- Water
- 2 small paper cups
- Permanent marker
- Collected big, broad leaves (optional)



Photo credit: Dennis Schroeder/NREL

Here's what to do:

1. Flip this card over. Have a look at the squash plant, solar panels, and any big, broad leaves you might find. How do they block sunlight? What makes them strong? What else do you notice?
2. Use your recyclables, tape, and scissors to design a structure to block the sun. Are you inspired by the leaf, the solar panel, or a combination of both?
3. Time to test it out! Take your paper cups and fill them up with the same amount of water. Use the marker to mark how high the water is.
4. Find a sunny spot for your testing. Place one cup of water underneath your shade structure. Put the other cup of water nearby.
5. Check your cups over the course of a couple days. Use your marker to draw a line where the water is in both cups. What do you notice? Was your design successful?

Explore Further:

- Improve your design! Does your structure provide shade all day, or just during a part of it?
- Ask a farmer or gardener: do they grow plants to shade others? What other plants are grown together and why?



Squash Plant



Solar Panels

Photo credit: Dennis Schroeder/NREL



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Future Plans:

- Developing activity kits for outreach programs
- Incorporating into professional development for teachers, youth development specialists, and librarians
- Translating into local languages



Climate Change STEM Activity Cards

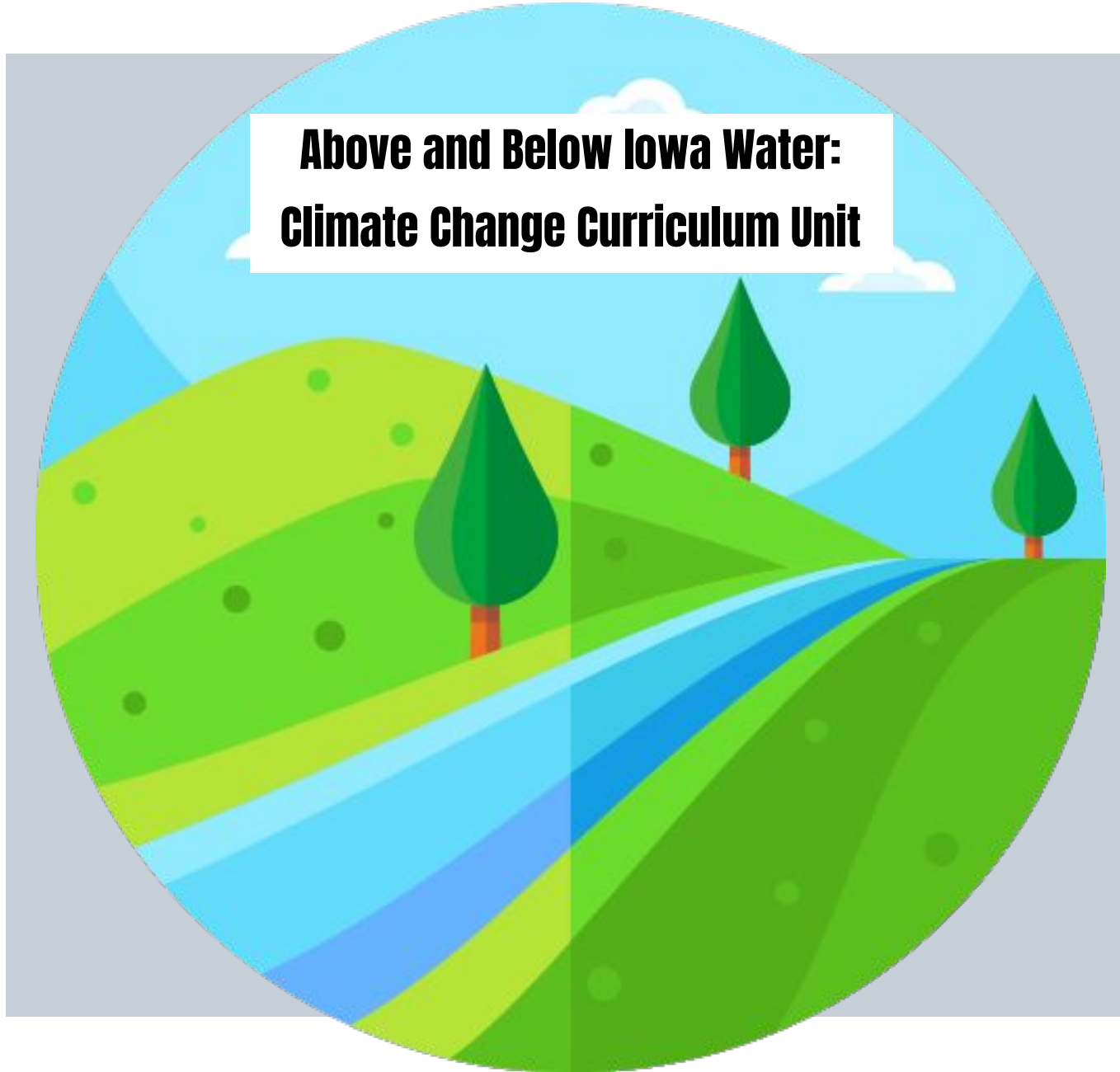
Lauren Butcher

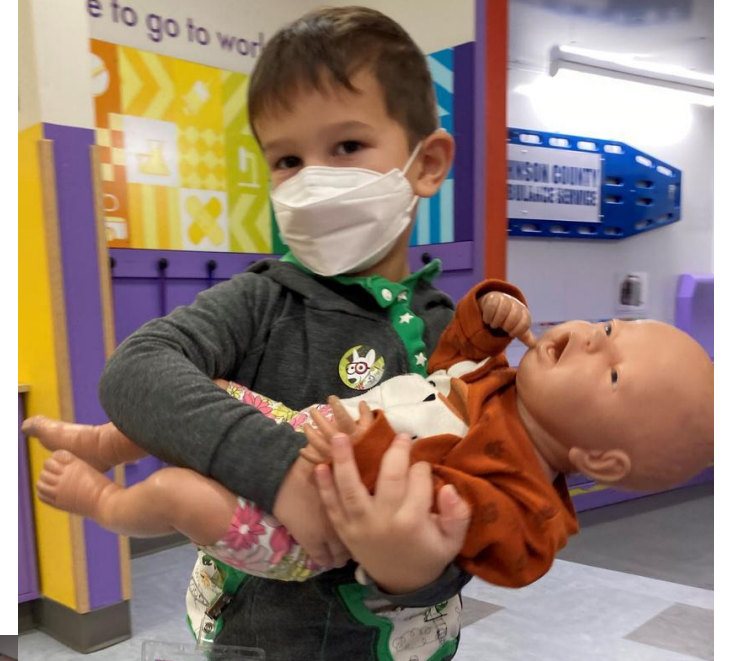
lbutcher@explora.us

Explora Science Center and Children's Museum



**Above and Below Iowa Water:
Climate Change Curriculum Unit**





THE IOWA
CHILDREN'S
museum
imagine • create • discover • explore

21st Century Afterschool Program at the Iowa City Community School District

Who we serve:

- Kindergarten through 3rd graders in four different schools within the district.
- Determined by the district, these schools are considered to have the most underserved and underrepresented populations compared to the rest of the elementary schools in the district.



Our Plan



Expand our curriculum unit to include four activities that support the learning goal of local climate change in Iowa by partnering with the State Hygienic Laboratory at the University of Iowa (SHL). But how do we offer this virtually to our partnering sites?

- **In one activity, students will learn about rivers around the state and what lives in a river by reading "Over and Under a Pond." Students will be expected to create a river scene that demonstrates and depicts what lives above and below a river. This activity is supported by the SHL by providing specimens they have collected in the rivers.**
- **In another activity, students will experience firsthand that climate change can have a direct impact on the environment but we can make solutions for that. Students will experiment with the use of plants to help eliminate erosion from occurring on shore lines of bodies of water during intense rain events and flooding.**
- **Allow for youth voice to be centered in these activities, asking throughout our virtual interaction about their thoughts on climate change!**
- **How do we make it relevant, especially since some of these students have never been to a river or have experienced a flood during their lives?**

Our mascot, Pete the turtle!

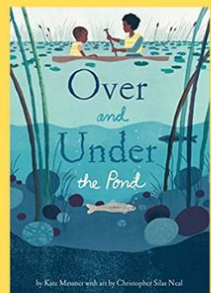


ICM ACTIVITY #1

Theme: Above and Below Iowa Water
(Engineering 101)

What You Need:

- Water scene template
- Markers
- Glue sticks
- Scissors
- Printed animals/plants



What You Learn:

Students will learn about what animals and plants live above and below water and that it is important to take care of our water.

What You Do:

1. Set up materials in a buffet-style set up.
2. Read the book "Over and Under the Pond" by Kate Messner to the students.
3. Students will use the water scene templates and add both animal and plant life above and below the water.
4. During this time, prompt the students to think about the relationships of the plants and animals. What if there was a factory or housing complex built right next to their water? How would that effect what lives near and under the water?
5. Climate change is due to human interaction with the environment. Climate change can be used as an umbrella term that covers a lot of things, but we are focusing solely on the effects of civic development near natural waterways which can lead to kill events by simply disrupting the environment with introducing pollution (noise and chemical) and other kinds of non-native wildlife.
6. Have students share their work with the rest of the group if time allows.



NNOCCI National Network for Ocean and
Climate Change Interpretation



Value

Protection

Why does it matter? What's at stake?



The story you're telling:

We must protect people and places from being harmed by the issues facing our environment.



Strategically redirects thinking away from patterns such as:

- Bottomless Grocery Store • Change Is Natural/Fatalism • Individualism
- Nature Will Fix Itself • Nature Works in Cycles • Solution = Recycling

Protection

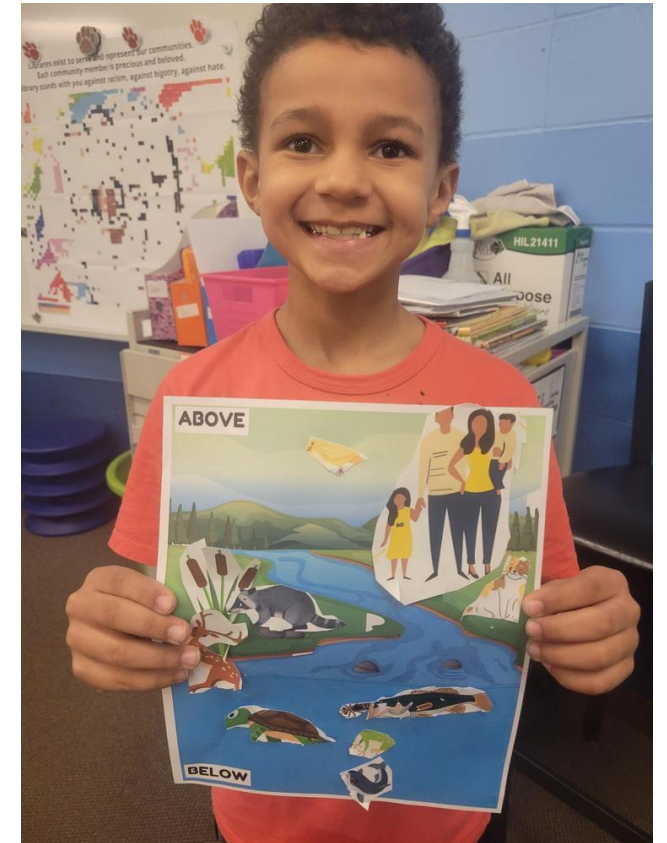
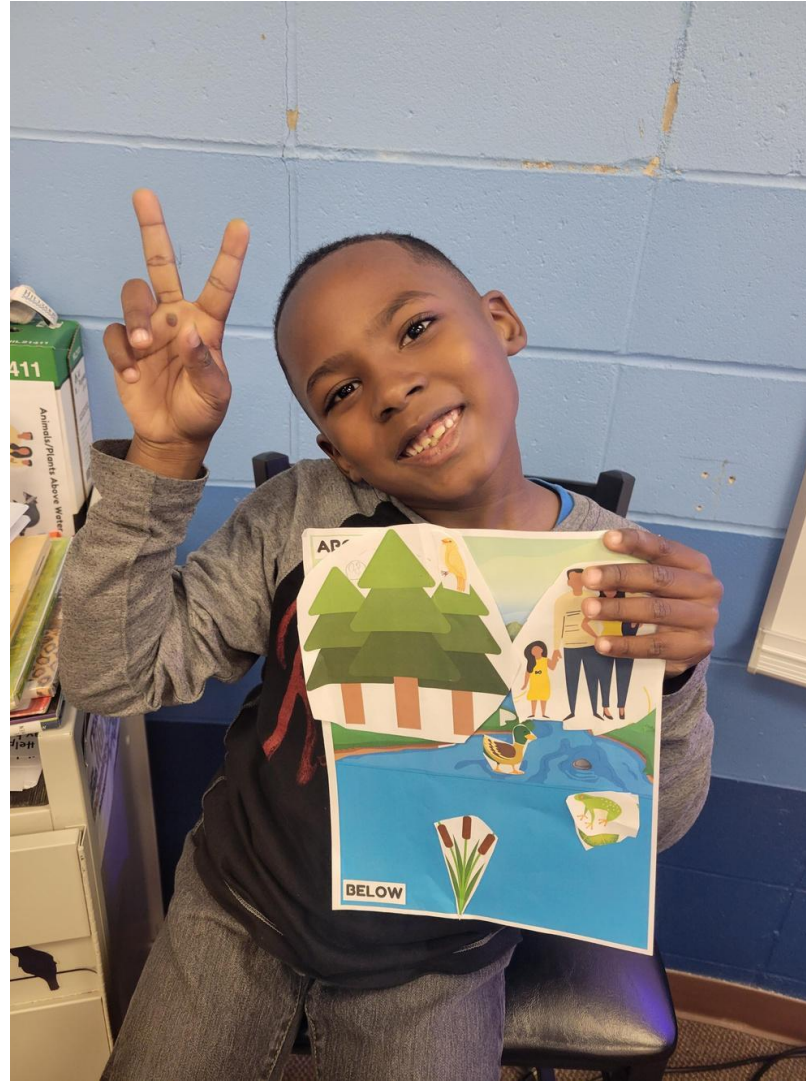


Concepts and ideas included in this frame element:

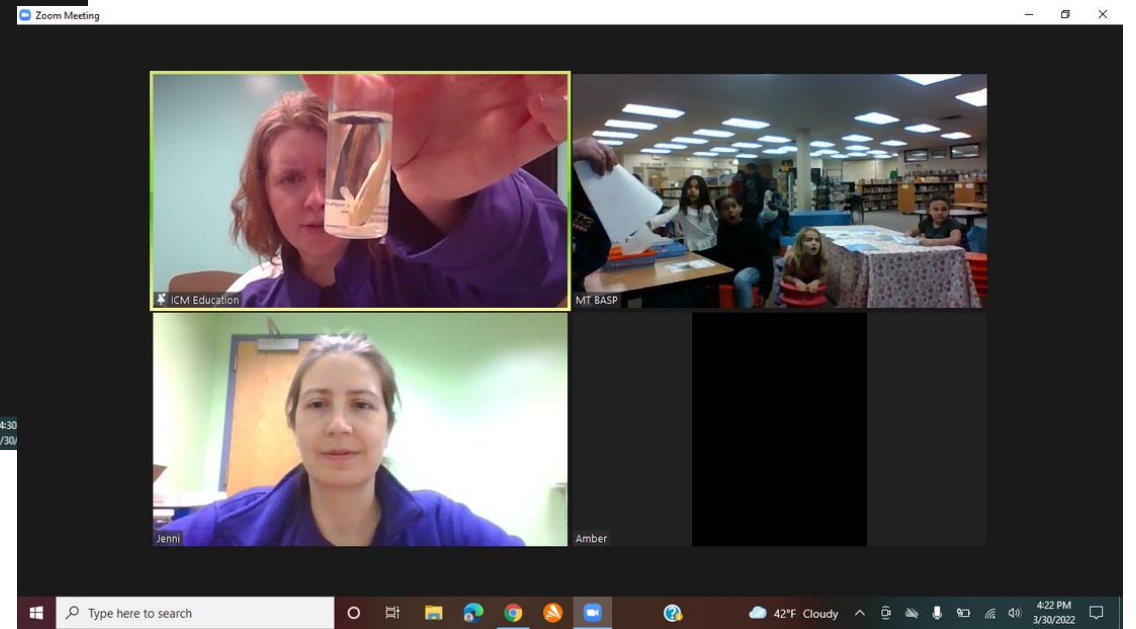
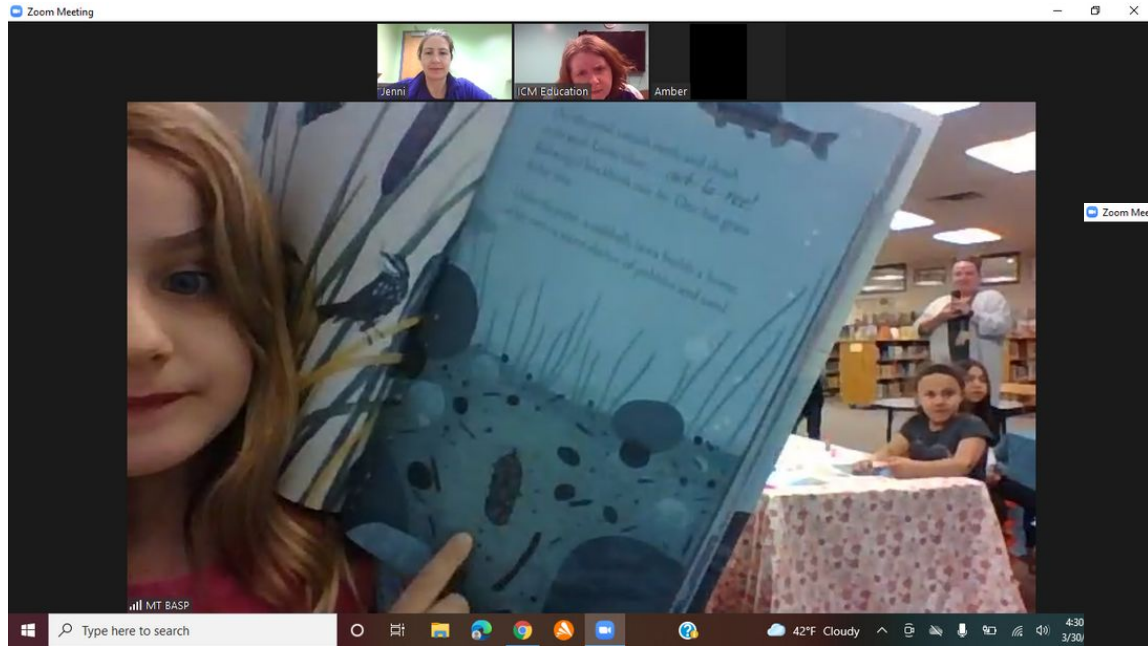
- We must protect and preserve the habitats and ecosystems we depend on.
- Showing concern for the welfare of others is the right thing to do.
- Stepping in to ensure the people's safety and wellbeing.
- Sense of agency: protection means actively eliminating or reducing risks.
- Sense of urgency: let's be vigilant in shielding and safeguarding habitats and people from harm.







What we have learned so far....



Together, we can make a turtle-y big change!



Rebekah Domayer
Education Program Manager
rdomayer@theicm.org
319-625-6255 ext 213

THE IOWA
CHILDREN'S
MUSEUM
imagine • create • discover • explore

NNOCCL Tips Overview

Climate Metaphors



“Heat Trapping Blanket” - CO2 acts like a blanket that surrounds the Earth. **More CO2** in our atmosphere means a thicker **blanket** that traps more heat.

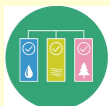


“Climate’s Heart” - Just as a heart circulates blood and regulates the body’s temperature, **the ocean** controls the circulation of heat and moisture throughout the climate system.

Values Metaphors for Communities



“Protection” - We must **protect people and places** from being harmed by the issues facing our environment.



“Responsible Management” - Taking **practical, common sense steps to address problems** facing our environment today is in the best interest of future generations.

Framing for Your Community



“Solutions” - Concern for our climate is normal and action on climate is happening all around us.
We can **come together as community members to address climate change**.

Embrace

Community action, responsibility, safety, the importance of oceans, we are problem solvers, and solutions in your community.

Avoid

(these can get you caught in a conversational “swamp”)

Individualism, jobs vs environment, new study every week, my observation is as good as yours, climate = yearly weather patterns, CO2 is ‘natural’ therefore it is good, politics, nature works in cycles, picking up trash/recycling is the solution.

Helpful Phrases

“Oceans support humans”

“Science is innovation”

“Ecosystems are valuable resources”

“We are connected to nature”

“We are a community of problem solvers”

“Our community came together and we’re
[local initiative]”



Metaphors



The Story You're Telling:

When we burn fossil fuels for energy, we add more and more carbon dioxide into the atmosphere.

This buildup acts like a blanket that traps heat around the world, which disrupts the climate.

Explanatory Metaphor

Heat-Trapping Blanket

A metaphor for the basic mechanism of climate change

Values



The Story You're Telling:

We must protect people and places from being harmed by the issues facing our environment.

Value

Protection

Why does it matter? What's at stake?

Local Issues and Solutions



Frame Element

Solutions

The Solutions frame element fosters hope and instills a sense of agency and efficacy.

The Story You're Telling:

Concern for our climate is normal and action on climate is happening all around us.

We can come together as community members to address climate change and help change the decision making context so that the sustainable choice is the easy choice for more people.

NNOCCL Tips Overview

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“Our community came together and we’re local initiative”]

Round Table Discussions

Sit at a table and discussion with your colleagues about which local issues and solutions you know of or need help identifying.

Share any successes/challenges you have had.

Let's take 10-15 minutes for this.

Round Table Discussions

Share Out!

Round Table Discussions

Q&A

Thank You!

Learn more and access the
NISE Network's online digital resources
nisenet.org



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Thank You

