
SOUTH CAROLINA'S COALITION FOR MATHEMATICS & SCIENCE

SCCMS

– Achievement by Design –

South Carolina



Education Month

DUKE ENERGY SCIENCE NIGHT

2023-2024 Program

Webinar #3 – Kit & Activities Overview

February 27, 2024

INTRODUCTIONS



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PARTNERSHIPS



Special Thanks to...

Tom Peters – SCCMS - Executive Director

Amanda Dow - Duke Energy Foundation – Stakeholder Manager

Erik MacIntosh– NCSciFest – Director

Kim Moore – NCSciFest – K-12 Program Assistant

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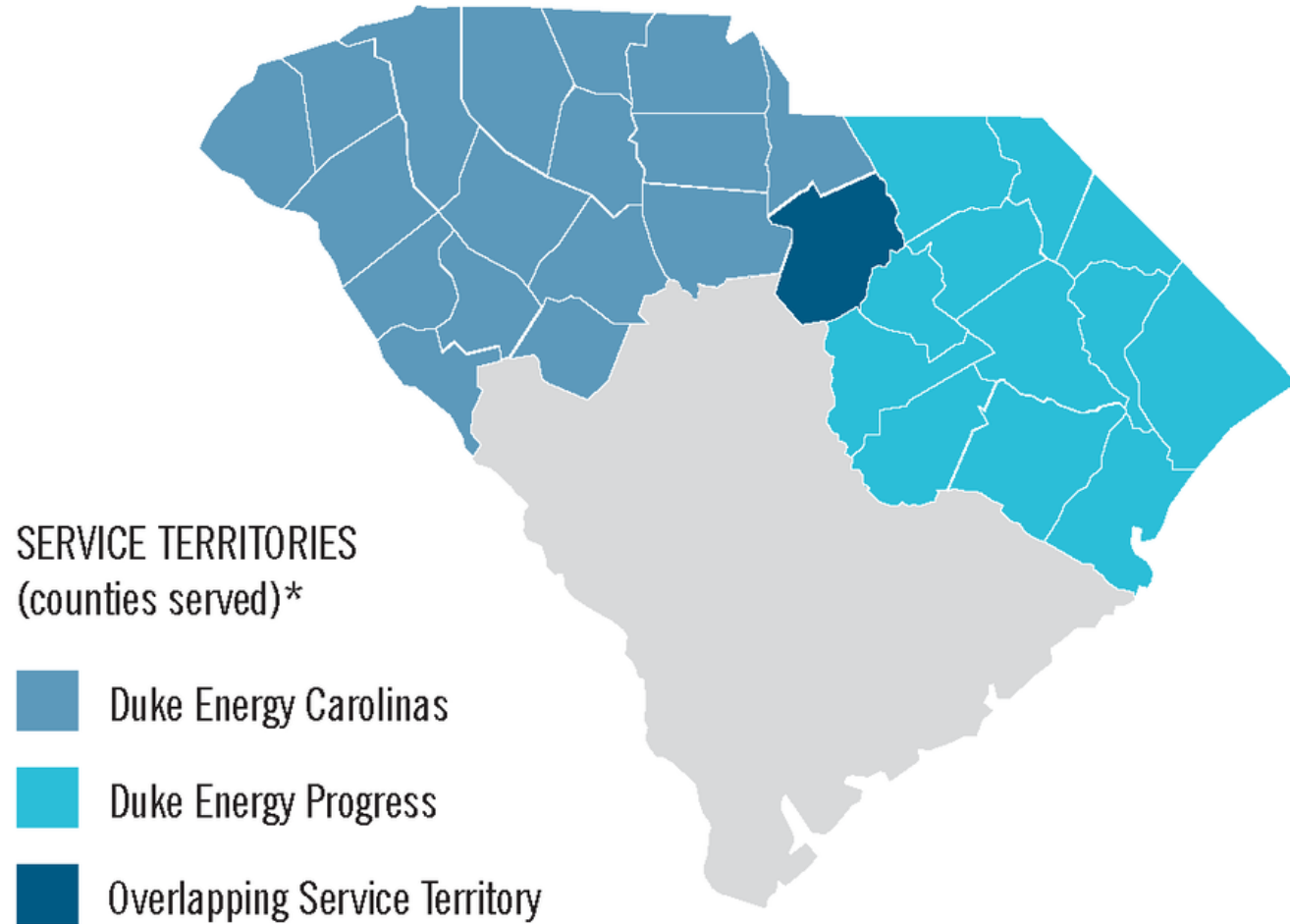


ABOUT SCCMS

- South Carolina's Coalition for Mathematics & Science
- Supporting STEM Education in South Carolina
- www.sccoalition.org

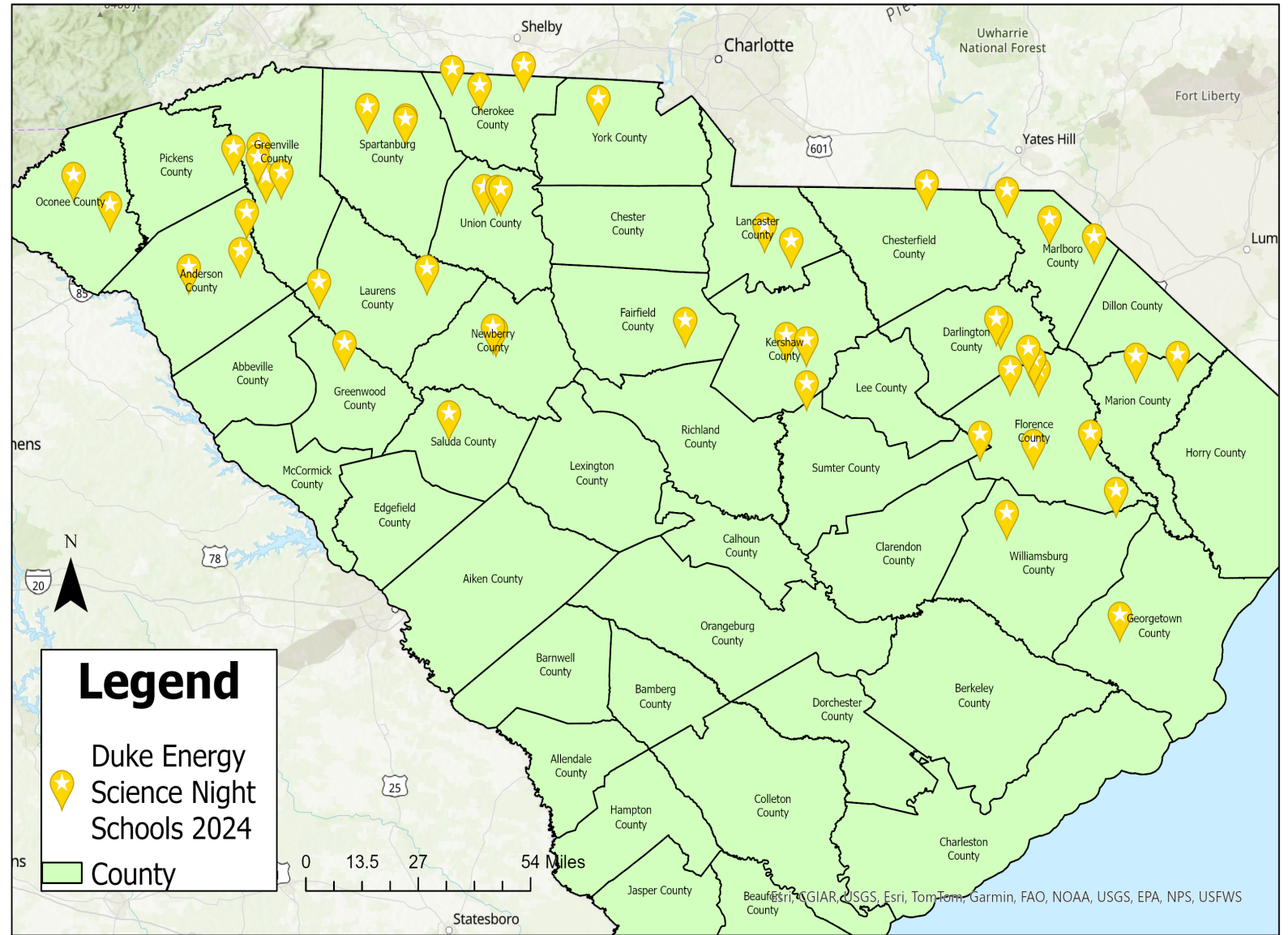


Duke Energy Service Area in South Carolina



**Portions may be served by other utilities.*

2024 Duke Energy Science Nights In 50 SC Schools



Duke Energy Science Night Participating Schools 2024

SC STEM EDUCATION MONTH



- March 14 – April 14, 2023 (starts on Pi Day!)
- Theme – Opportunity in the EcosySTEM
- Inviting students, educators, business / industry and government to celebrate STEM education.
- STEM Day at the Capitol – April 10, 2024

www.scstemmonth.org

#SCSTEMMonth

#SCEcosySTEM

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ACTIVITY GUIDES & INSTRUCTION SHEETS

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DUKE ENERGY SCIENCE NIGHT Boat Builders

Big idea
Explore a force called **buoyancy** by designing and building a boat with a simple household material.

You will need
WHAT WE GAVE YOU:
• aluminum foil
• glass stones
• Boat Builders instruction sheet

STUFF YOU PROVIDE:
• 1-2 large plastic tubs
• 1-2 large towels
• 1-2 containers to hold the glass stones
• water
• paper towels



Set it up
Fill the plastic tubs no more than 2/3 full of water. Place the towels on a stable surface that won't be easily jostled and put the containers of water on the towel. Place the Boat Builders instruction sheet on the table along with the foil sheets and glass stones.

It's showtime!
Explain to students they'll be using the design process (question, plan, build, test, improve) to experiment with buoyancy. The essential question to ask students is if different shapes of boats can hold different amounts of weight before sinking. Give each student one sheet of aluminum foil to shape and fold however they would like. Once they're ready, have them place their boat in the tub of water and count how many glass stones they can add before it sinks.

If they love it...
After their boat sinks, they can pull it out of the water and reshape it to see if they can build a better boat. Students can redesign and retest their boat as many times as they'd like as long as it doesn't rip the foil.

Fun options
AHEAD OF TIME
In one of the plastic tubs, create a saltwater solution inside. Stir in regular table salt ¼ cup at a time until no more salt will dissolve in the water. Ask students to compare how the same vessel behaves in both fresh and salt water.

Continued >



DUKE ENERGY SCIENCE NIGHT
Boat Builders

Why is this science?
Gravity is a force that pulls everything on Earth downward. **Buoyancy** is a force that pushes upward on objects that are in fluids (liquids and gases). Ships use the force of buoyancy to float even when the ship itself is made of a very dense material that would normally sink, like metal. The shape of a ship determines how much weight it can carry. Large ships such as cargo ships and aircraft carriers push a lot of water to the side; this is called displacement. The more water that a ship displaces, the more buoyancy will push up on it, and the more weight it can carry. If you look closely, you may even see the water level going up in the plastic tub as students add marbles to their boats causing their boats to displace more water.

South Carolina College- and Career-Ready Science Standards 2021
Explore a force called buoyancy by designing and building a boat with a simple household material.

Performance Expectation: K-PS2-2: Analyze data to determine if a design solution works as intended to change the speed or direction of an object with push or pull. 5-PS2-1: Support an argument that the gravitational force exerted by Earth on objects is directed down.

Science & Engineering Practice: Analyzing and Interpreting Data; Engaging in Argument from Evidence

Disciplinary Core Idea: PS2.A: Forces and Motion – Pushes and pulls can have different strengths and directions. Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. PS2.B: Types of Interactions – The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center.

Cross-Cutting Concept: Cause and Effect

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2024 ACTIVITIES

Activity	Concept	Activity Details
Boat Builders	Buoyancy	Design and build a boat with simple materials.
Capillary Flowers	Botany	Explore capillary action while making a colorful paper flower.
Fingerprints	Life Science	Explore the 3 main fingerprint patterns.
Light It Up	Conductivity	Explore electrical circuits through transfer of energy.
Moon Craters	Earth, Moon, & Sun	Explore what causes craters in the moon.
Paper Flying Machines	Forces & Motion	Build different flying machines to explore forces of flight.
Solar Eclipse Art	Earth, Moon, & Sun	Learn about solar eclipses while making a work of art.
Sound Sandwich	Sound	Discover why we can hear and sometimes feel sound.
Stomp Rockets	Forces & Motion	Build a rocket and blast it into the air.
UV Bracelets	Earth, Moon, & Sun	Make a bracelets using special beads to learn about UV light.



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2024 Duke Energy Science Night


NCSciFest
10 videos 24 views Updated 3 days ago


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Funding from the Duke Energy Foundation allows NC Science Festival staff to produce this program for elementary schools across the state. The Duke Energy Science Night program is designed to help schools host a fun science event for their students and families with the use of a resource kit that includes hands-on activities, a planning guide, activity instructions, materials for up to 200 participants, and the support of NCSciFest staff.


- 


Moon Craters - Duke Energy Science Night Activity
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Boat Builders - Duke Energy Science Night Activity
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Fingerprints - Duke Energy Science Night Activity
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Solar Eclipse Art - Duke Energy Science Night Activity
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Capillary Flowers - Duke Energy Science Night Activity
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UV Bracelets - Duke Energy Science Night Activity
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- 

Sound Sandwiches - Duke Energy Science Night Activity
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BOAT BUILDERS

- **Requires items not included in kit:**
 - Large tubs of water, towels to catch spills, small plastic containers.
- **Additional Idea:**
 - How many stones does it take to sink your boat?



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CAPILLARY FLOWERS

- **Requires items not included in your kit:**
 - Pitcher of water to refill cups, paper towels for easy clean-up.
- **Setup tip:**
 - 3 tables/stations: 1 for conducting the experiment, 1 for coffee filters to dry, 1 for making flowers.



- **Additional Idea:**

- Make a real capillary action flower the day before your event.



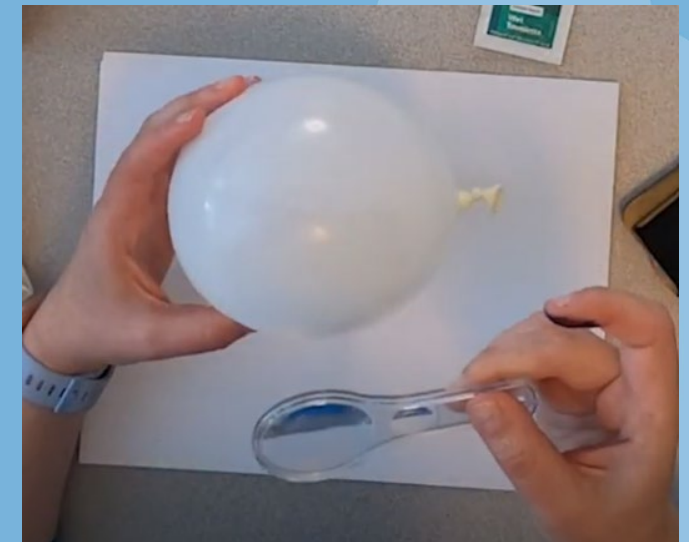
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FINGERPRINTS

- **Requires items not included in your kit:**
 - Printer paper
- **Set up tips:**
 - Keep a trashcan near by.
- **Troubleshooting:**
 - The more the balloon is blown up, the more the ink spreads out making it more difficult to see the fingerprint.



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LIGHT IT UP

- **Additional Ideas**

- Have a group stand in a circle holding hands. The person on one end of the circle touches a metal piece while the person on the other end of the circle touches the other metal piece to close the circuit.



MOON CRATERS

- **Troubleshooting:**
 - Remember to remove plastic sheet that blocks the battery.
- **Additional Recommendations:**
 - Drop different sized and shaped rocks from different heights or angles to see how it impacts the craters made.
 - Using the flashlight – hold at an angle to represent a half moon to help see differences in craters made.



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PAPER FLYING MACHINES

- **Setup tips:**

- Use masking tape to make a “runway”.
- Mark distance measurements to participants can see how far their flying machine travels.



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SOLAR ECLIPSE ART

- **Requires items not included in your kit:**
 - Pencils, scissors, tissues are recommended for easy cleanup.



SOUND SANDWICH

- **Troubleshooting:**

- Make sure larger rubber band is only wrapped around one of the craft sticks.
- Make sure small rubber bands are wrapped tightly on each end – younger participants will need help with this.
- Make sure the participant is blowing air through the craft sticks and not through the straws.

- **Additional Recommendations:**

- Encourage participants to see if they can make different pitches by adjusting their sound sandwich.



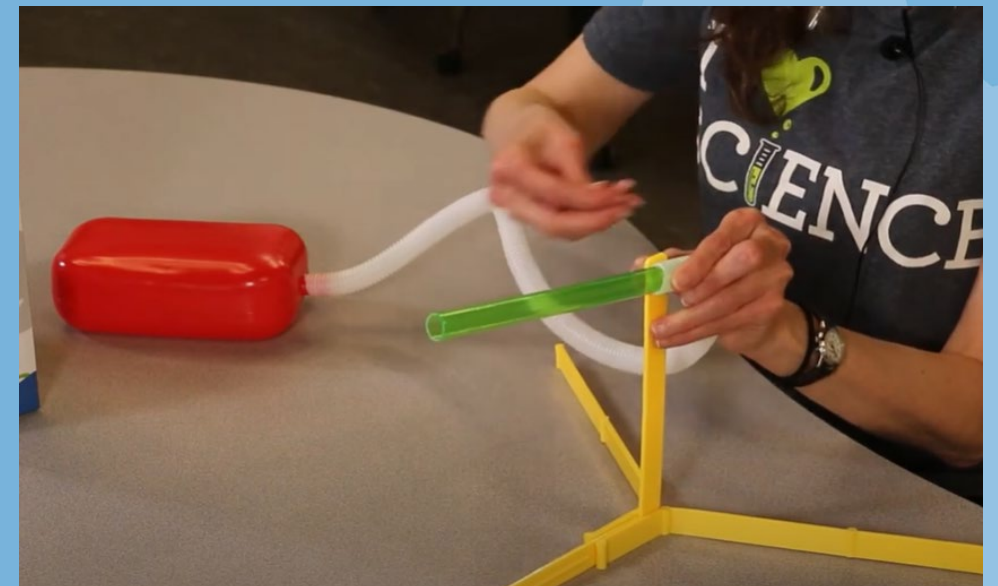
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STOMP ROCKETS

- **Set up Tips:**
 - Outside or in a large indoor space with high ceilings (gymnasium).
 - Follow along with video to build a model and assemble the launcher.
- **Additional Recommendations:**
 - Use a marker to help make the body of the rocket the right size.
 - Adult should be staffing the launcher at all times.



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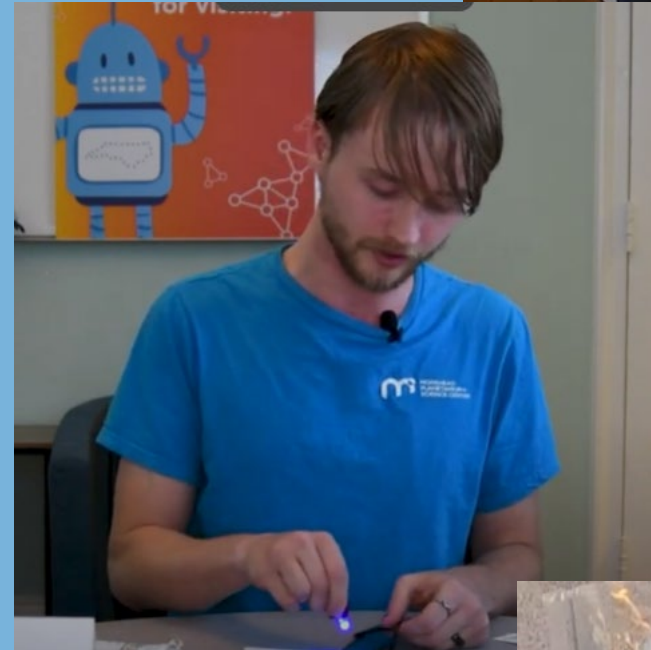
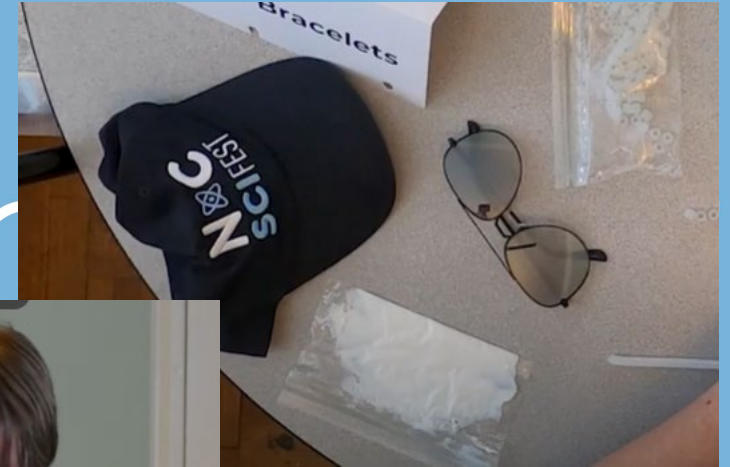
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UV BRACELETS

- **Requires items not included in your kit:**
 - Sunglasses, hat, sunscreen, etc.
- **Additional Recommendations:**
 - If you use sunscreen – keep in a plastic baggie to reduce messes.

- **Safety Note:**

- Beads are a choking hazard for little ones.
- Do not look directly into UV light.



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TIMELINE



- **Feb 27, 2024:** Webinar - Kit and Activity Overview
- **Mar - Apr 2024:** DESN Events! Yay!
- **Apr 25, 2024:** Evaluation and feedback due to SCCMS
- **May 2, 2024:** Webinar - Program debrief and feedback

Questions?

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