# The Reflector



Editor Dr. Mary Ellen Durham

# The Wait is Almost Over!



The North Carolina Science Teachers Association will host the 2024 Professional Development Institute (PDI) "Rocking Out the New Standards in an Everchanging World!" on November 7-8. 2024 at the Benton Convention Center in Winston-Salem, N. C.

This annual two-day event promises to be filled with opportunities for educators to expand their scientific knowledge, enhance their instructional skills, connect and collaborate with other energetic and innovative professionals, explore cutting-edge resources, and engage in many other fun-filled activities.

The PDI includes two general meetings featuring keynote addresses by Dr. Carol O'Donnell on Thursday and Dr. Nehemiah Mabry on Friday. Conference attendees will be able to participate in share-a-thons and attend over 120 contentrelevant concurrent sessions. The very popular raffle and spin-a-wheel events will be offered again, providing multiple chances throughout the conference to win valuable prizes. Highlighting Thursday evening will be the annual awards ceremony and reception.

Attendees are encouraged to visit the extensive exhibit hall to examine and assess the latest instructional resources and learning experiences. (A list of <u>exhibitors</u> is on the NCSTA website). Additionally, a unique pre-conference sunset field trip to Pilot Mountain State Park is available on November 6, 2024.

Boost your instructional skills, expand your professional knowledge, and network with other science educators. <u>Register</u> today for the 2024 PDI! Remember, up to 1.2 CEU credits can be earned during the two-day conference.



NCSTA 2024 President's Message

Fall 2024



The recent flooding and resulting devastation to western North Carolina has been catastrophic, disrupting many lives and resulting in both property and human loss. NCSTA extends to all North Carolinians impacted by the natural disaster our deepest condolences for your losses and true concern for your safety and well-being. May you find the strength to face the challenges that lie ahead for you. The NCSTA family keeps you in our thoughts as you recover.

North Carolina science educators are resilient and strong. NCSTA will host the 2024 PDI in November where together, as a team of science education professionals, we will comfort, support, share, and help one another move forward in a united effort to provide the best science teaching and learning that is possible in all areas of the state. Let us all meet in Winston-Salem at the PDI.

Regards,

Tom Savage

# SCHED APP

The conference APP SCHED will be used at the 2024 NCSTA PDI. For the latest updates to the conference sessions and activities, download and install SCHED on your preferred electronic device.

To access SCHED on your tablet or cell phone: 1. Download and install the SCHED APP. A free account is available. (If you choose to create an account you will be able to add sessions to your personal schedule).

2. Search for NCSTA PDI 2024

3. Tap on any listing for detail

For help in using SCHED use this link. <u>https://sched.com/support/section/guide-for-attendees/</u>

Presenters. use this link. <u>https://sched.com/support/section/speaker-tools/</u>



# PDI Registration

Hours for the 2024 PDI registration desk, located in the main lobby of the Benton Convention Center, are 7:30 AM to 3:30 PM on Thursday, November 7th and 7:30 AM to noon on Friday, November 8th. Stop by to pick up valuable raffle tickets, your name tag, lanyard and tote bag.



# **Reception and Awards Ceremony**



On Thursday evening all PDI attendees are invited to a reception to celebrate science education in North Carolina. The reception will feature a heavy hors d'oeuvres buffet and a cash wine, beer and beverage bar. Immediately following the reception will be the annual awards ceremony where NCSTA recognizes statewide and district-level nominees for their roles in promoting excellence in science education. Tickets will be drawn for prizes and Grant-a-Wish winners will be announced. Plan to join the NCSTA board at these exciting and fun-filled events.



# Dr Clinton L. (Jake) Brown: Life-long Science Education Advocate

**D**r. Clinton L. (Jake) Brown has played a critical role in science education in North Carolina for over 60 years and has been an active member of the North Carolina Science Teachers Association (NCSTA) since 1972. Dr. Brown recently met with the editor of The Reflector to discuss his passion for science, his dedication and efforts to promote effective science teaching, and perspectives regarding NCSTA. Highlights from that meeting follow.

#### Q: Dr. Brown, when and why did you become involved with science education?

A: My entry into science education actually began as a biology major while attending Mars Hill University. I discovered that I loved biology and when you love science, you become excited and want to share it with others. My undergraduate experiences led me to becoming a high school biology teacher. My first job as a science educator was at Tuscarora High School in Haywood County, NC. Working with my students, engaging them in science, prompted a desire to be an exceptional science teacher. Subsequently, I pursued a master's in science education from Western Carolina University. Later I attained my PhD in science education from N.C. State. I came to realize that one does not have to "know everything in science". One can instill in your students a joy in learning, excitement and scientific interest through talking, sharing ideas and having hands-on experiences. You do not have to know the names of every seashell on the beach to engage students in classification. Have the students' collect shells then sort by shape or color. Speculate on how the various shapes might benefit the animal. The students, without nomenclature, are engaging in scientific processes.

#### Q. What were your activities beyond that of classroom teacher?

A. Upon leaving the classroom I worked for the North Carolina Department of Public Instruction (DPI). Over my 26-year career with DPI I had the opportunity to be involved with several key science education initiatives. I worked extensively with staff development, conducting many, many teacher workshops. We focused on helping teachers understand what science is: not just content knowledge, but how to enable students to develop scientific process skills. I engaged in curriculum development, often referred to as the Standard Course of Study. Curriculum is vitally important. It is an ordered series of objectives: what should be taught and more importantly, why. Curriculum is multi-faceted. It identifies relevant science topics, demands good teaching and requires assessment. In my opinion teaching is the most important element. The science educator must be able to appropriately relay information, instill a joy in learning, and establish a need to know the science topic with each student. Although the curriculum identifies the topics to be covered, teachers have tremendous flexibility. It is the teacher that decides the instructional strategies, the timing of study, the materials used and how students demonstrate mastery. Teachers are responsible for creating curiosity, relevancy, and student learning.

I also oversaw the planning, development and implementation of North Carolina's first K-12 science testing program. Assessment is critical in that it helps educators know when we are doing a good job and where we need to improve. It identifies factors that can either enhance or be a barrier to student mastery. Two other programs with which I was involved were textbook review and adoption and facility plan reviews. Under the textbook adoption process, publishers would submit texts and learning materials to the DPI for endorsed usage in teaching the standards. I was able to meet and work with science educators across the state as they reviewed and assessed the materials for age appropriateness and science accuracy. As new public schools were being planned and built, contractors sent their design plans to DPI to confirm that science classrooms were designed to meet instructional and safety needs. One of my greatest pleasures was working to establish student competition: Science Olympiad, Student Academy of Science, and the state Science Fair.

Upon my retirement from DPI, I taught science and science methods classes at UNC Central, East Carolina University, Wesleyan College, Mt Olive University and Campbell University. I found working with pre-service teachers and science majors a joy.

Clinton L Brown continued...



#### Q: When did you join NCSTA and what motivated you to do so?

**A:** I joined NCSTA in 1972. I would have joined earlier, but please realize that in the early 70's mail was the prominent means of communication, and it was several years after the Association was founded that I learned of it. I joined to learn what other science teachers were doing. Good teachers need to share, collaborate, and find out about what is effective in the classroom. I credit the classroom teachers, college professors, leaders at DPI and our partners who teach science in non-school settings for establishing an organization dedicated to specifically help North Carolina educators be effective teachers.

# Q: NCSTA has existed for 55 years. During that time what significant events have impacted how science is taught and what role has NCSTA played in addressing those events?

A: Over those 5 decades much has changed. We know more. There has been scientific discovery, content has been updated, and society has changed. The demand for scientifically literate learners has emerged from industry, businesses, world events, parents and the students themselves. NCSTA has played a major role in helping teachers successfully meet those demands. The association has kept science educators informed of content advancements, curricular changes, innovative teaching techniques, and assessments. It has provided venues for professional development, as well as opportunities for educators to learn of scientific discoveries and cutting-edge resources. NCSTA has provided a means for teachers to collaborate and share ideas. It has also helped teachers learn of the opportunities for the teaching and learning of science through our non-traditional science settings like the NC Aquariums, the Zoo and state parks. NCSTA has helped teachers better understand how to conduct classroom activities safely and with consideration for the students' various needs.

#### Q. Considering contemporary practices, how do you see the role of NCSTA today?

**A.** I see that our ultimate goal is to equip every child in the state with the knowledge and skills to be scientifically literate. That occurs when our children have excellent science teachers. NCSTA works to ensure we science educators teach our courses properly; so, every child knows what is in the realm of science, understands the science topics cited in the standards, and can successfully use the skills and processes associated with the discipline. NCSTA provides a venue for teachers to share and collaborate on best practices, identify proper resources, and enrich the curriculum with new and innovative instructional ideas.

#### Q. Why should today's science teachers join NCSTA?

**A.** NCSTA is the science teacher's advocate. It provides information on the curriculum, resources, assessment and professional development. More importantly, it assists educators in "sharpening their skills." It promotes cooperation, networking, and professional discussion. It showcases effective classroom strategies and ideas. It helps one learn new, and possibly better ways, to teach, evaluate and know how to reach your students.

#### Q. How many PDIs have you attended? Why do you attend?

A. This year will be my 51st PDI. The conference offers new teaching ideas and showcases excellence in the science classroom. When there I get to visit with friends and talk to other teachers. I become aware of instructional issues and what works to solve learning problems. The PDI enables science teachers to help other teachers. Simply put, the PDI keeps me up to date with what works best in today's science classrooms.

#### Q. Why should our current classroom teachers attend the PDI?

**A.** I encourage today's science teachers to join NCSTA and attend the PDI. There is enormous pressure on teachers today to provide quality instruction that ensures our children are benefiting from their learning experiences. Teachers need to help one another in attaining effective instruction. A teacher may have the most perfect lesson that always leads to all the students engaging and learning science, but if she keeps it to herself only her students benefit. If she shares it with other teachers and they use the technique, many students successfully learn. Teachers need to meet, talk, and help each other professionally grow and develop. NCSTA through its PDI provides a platform for mutual support, encouragement, problem-solving, and sharing of ideas. Joining NCSTA and attending the PDI helps science teachers help one another.

#### Q. What do you see as the future for NCSTA?

**A.** NCSTA needs to continue helping our science teachers engage in best practices. The organization needs to serve as a science teacher advocate and increase its efforts to collaborate with school administrators and superintendents, which will garner greater support for professional development for those teaching science at all grade levels. The association could make efforts to inform the General Assembly regarding advancements in science learning and seek greater awareness and support from our legislators.

In addition to his 52-year membership in NCSTA, Dr. Brown has held multiple positions on the association's board. He has served as DPI Liaison, Pre-service and University Liaison, and past editor of The Reflector. Dr. Brown was the 2003 Vi Hunsucker awardee. NCSTA commends Dr. Brown for his lifelong commitment to enhancing science education and helping North Carolina's science teachers.



# Wednesday 11/6/2024 5:00 PM to 8:30 PM

Join the Schools in Parks team for a science enrichment field trip to Pilot Mountain State Park. Transportation will be provided from the NCSTA conference, meeting at the lobby of the Winston-Salem Marriott downtown/convention center. Enjoy the sunset (6:26 PM) from the overlook atop Pilot Mountain. See the new Visitor Center featuring natural science exhibits. A catered dinner and talk with park rangers about the science of protecting the natural resources including monitoring migrating hawks and setting prescribed fires.

Meet partners from UNC-Institute for the Environment, the Office of Environmental Education, and North Carolina State Parks. Network with fellow science educators in a state park, after hours.

#### Maximum: 30 participants

Cost \$18.00 per person. To Register and pay click here: <u>Pilot Mountain Field Trip.</u>

Schedule

5:00 PM Meet at the Winston-Salem Marriott-downtown lobby for Van Transportation

5:45 PM Guided Hike on Pilot Knob Trail (1-m optional) or hang out at the Overlook

6:25 PM Sunset, then vans Depart the Summit for Dinner in Visitor Center

7:45 PM Vans Depart the Park to Return to Winston-Salem

8:30 PM Arrive back at Marriott Downtown

note: catered meal includes vegan and gluten free options



### Supporting Pre-Service Teachers: Call to Action by NCSTA



#### By Adrienne Evans

As the president-elect of the North Carolina Science Teachers Association (NCSTA), I am excited to reaffirm our organization's strong commitment to supporting pre-service teachers as they embark on their journey to becoming effective science educators. Preparing the next generation of science teachers is critical, and we believe that engaging pre-service educators with professional development opportunities early in their careers is an invaluable investment in the future of science education.

One of the key benefits for pre-service teachers who join NCSTA is access to our annual Professional Development Institute (PDI). For two days in November, teachers will attend sessions led by veteran educators in their subject areas. These sessions are designed to provide practical lessons, strategies, and activities that can be implemented in the classroom immediately. Attendees will walk away with tools they can confidently use from day one in their own teaching careers.

The PDI is structured to foster professional connections, enabling pre-service teachers to meet and network with seasoned educators who can offer mentorship and support throughout the year. A standout event for pre-service teachers is **"Reality Check – Networking with Science Educators,"** an informal lunch where participants engage with accomplished teachers and share their experiences with fellow pre-service educators. This casual setting allows them to build relationships and gain insights into the realities of classroom teaching.

Pre-service teachers are encouraged to participate in the Share-a-Thon. This is a low-pressure opportunity for them to share an activity or lesson with peers and veteran teachers, helping them build confidence while adding valuable experiences to their resumes. More details about the Share-a-Thon can be found <u>HERE</u>.

Beyond the November PDI, our pre-service science educators have access to the NCSTA newsletter, The Reflector. This e-publication recognizes the professional accomplishments of North Carolina science teachers and student groups engaged in science activities. It provides updates regarding science related events and student competitions, as well as identifies professional development opportunities. Articles summarizing NC relevant science topics, ideas for learning experiences and teaching tips are included.

NCSTA is diligent in recognizing undergraduate teacher education students seeking certification from a North Carolina college or university who demonstrate outstanding ability and promise in the teaching of science during the student teaching process. The Association may award an elementary, middle grades, and high school Outstanding Student Teacher Award to novice science educators who show exceptional teaching skills.

We encourage all pre-service science teachers to join us and take advantage of these invaluable opportunities. Together, we can continue to strengthen science education in North Carolina.







NCSTA commends our preservice teachers for their career choice and welcomes our emerging professionals to the 2024 PDI. The association will host **REALITY CHECK-Networking with Science Educators**, a pizza party and informal session exclusively for undergraduate education majors, pre-service educators, and student teachers on Thursday, November 7, 2024. During the party, veteran teachers and NCSTA board members will address questions, share classroom strategies, and make recommendations on how to effectively engage in a wide range of teaching/learning activities. University advisors and cooperating teachers are asked to facilitate our emerging science educators' PDI attendance and participation in Reality Check.

# Warning: Troubled Waters



The World Resources Institute (WRI) warns that the demand for water could outstrip supply by 2050. Many areas are already experiencing water stress fueled by climate change, overextraction for agriculture, population over consumption, pollution, and land-use changes. Most populated areas on the planet are experiencing more frequent periods of drought. The earth has lost almost 33.3% of its freshwater ecosystems and has seen an 83% decline in freshwater species populations. Only a third of the world's rivers remain free-flowing, and wetlands are declining three times faster than forested areas. WRI encourages science educators at all grade levels to engage students in learning activities that focus on the importance of protecting and preserving wetlands and water sources.

# My Go Global NC Educational Experience



#### By Carrie Fugel

This past June I participated in the Go Global NC professional development initiative in South Korea. The experience was nothing short of fantastic! As the 2023-2024 Cabarrus County Teacher of the Year, I am incredibly grateful that the Mariam and Robert Hayes Charitable Trust made it possible for me to participate in this year's study program.

The Go Gobal delegates from across North Carolina who participated in the South Korean program were incredible leaders: hardworking, dedicated and education-minded folks. Engaging with these outstanding educators led to the best possible professional development opportunity! South Korea offered us an upclose glimpse of their educational practices, sustainability initiatives, culture and history. It was an experience that was truly remarkable, and I am forever thankful.

There were many program events that were very meaningful for me. I visited an all-girls public high school that encourages young women to pursue careers in science related fields. I interacted with educational leaders who emphasized the importance of incorporating nature into their lessons. I examined incredible advancements in sustainability practices with waste management in Seoul. I learned about the rich culture of the Korean people.

As an Earth/Environmental science teacher, much of my passion for environmental science was evidenced during my South Korea experience. We visited schools located in Incheon, approximately 30 minutes from Seoul. As we traveled to and from each day, I enjoyed seeing the changing landscape where so many of the urban areas incorporated greenspaces and agriculture practices. In Korea, 70% of the peninsula is mountainous with less than 20% of the land used for agriculture. With the need and desire for fresh local food, the Korean people have added agricultural space into what appeared to be every corner. Whereas in the USA, the gap area alongside the interstate is usually grass, Koreans have maximized this space by using it for growing their own food. Even little shops have vegetables growing in containers right outside their doorsteps. Every school we visited had greenspaces and gardens. With an emphasis on respecting the environment, the students took ownership in learning about native species and cultivating plants from seed. This aspect of my South Korea trip helped me to remember that my, oftentimes exhausting, efforts to create a school garden and maintain a greenhouse is achievable and important for my students and their educational experience.

Another delegate commented that the sheer number of "non-scheduled moments" truly enhanced this experience for us. This statement resonated with me as there seemed to always be short periods in between our scheduled activities where we were able to brainstorm, connect, and collaborate in completely authentic ways. Go Global NC offers professional development opportunities every summer. Teachers who may be interested in participating in study programs should explore their website, <u>Global Teachers Fellowship</u>.

공유하게 해주셔서 감사합니다 Thank you for allowing me to share,



Carie Fugle, Cabarrus County Teacher of the Year ('24) West Cabarrus Science Teacher, NCSTA District 6 Director



Want to deepen your understanding of the Science and Engineering Practices (SEPs)? Join us for an evening of learning, laughter, and beers (for science) as we dive into the SEPs and the **new North Carolina Science Standards!** 

# Oct 24, 6pm

Tobacco Road Sports Cafe 280 S. Mangum Street Durham, NC 27701



Spots are limited, so RSVP today!

# What to Expect:

#### **Expert Guidance:**

Become a pro! We'll show you how to incorporate these practices and directly connect them to the standards.

#### **Collaborative Atmosphere:**

It's networking, but at a pub! Meet with other educators, swap ideas, and enjoy complimentary beverages.

#### Vetted and Recommended:

Stile is the only complete middle school curriculum recommended for approval by NCDPI (not to brag).

#### A Toast of Appreciation:

Did we mention beers are on us? We're sponsoring this evening as a thank you to North Carolina teachers.

Come thirsty for knowledge - and a great time!

# NCSTA Spotlight

This Reflector spotlight is on Joann Blumenfeld, a STEM/Special

**Education** rockstar. She is a 20-year Wake County Public School System veteran teacher of K-12 special education, middle and high school science, and middle grades language arts. However,

it is her passion and unending commitment to helping students with disabilities that makes her extraordinary. In addition to writing curriculum, publishing articles and making presentations advocating STEM support for learners with disabilities, Blumenfeld founded and is currently the program director of Catalyst. Located at the Science House at NC State University, Catalyst is a free national awardwinning program opportunities for designed to create STEM high school students with disabilities. The Catalysts program equips its enrollees with STEM content and skills, as well as workforce and college readiness skills.

Ms. Blumenfeld is recognized as a Kenan Fellow, NASA Educator Ambassador, NCSLA Fellow, NSTA Beginning Teachers Dow Fellow, and was selected in 2022 by Time Magazine as an Innovative Teacher. She has won the Friday Medal, The Henry Ford's Innovation Nation Teacher Innovator Award, and The North Carolina Council for Exceptional Children's Teacher of Excellence Award and many other honors. NCSTA commends Joann Blumenfeld for her tireless dedication in providing STEM learning experiences to ALL students.





# Help for Our Forests

Our forests are under constant attacks from invasive insects and diseases. The negative impact of woodland pests on forest health, wildlife, and local economies is huge. In addition to safeguarding many ecosystems, forest health is critical for climate stability. According to a recent study by Leigh Greenwood, a forest pathologist, woodlands severely damaged by insects and diseases sequester an average of 69% less carbon than healthy forests.

Many infested trees die each year, but remarkably not all succumb. Some survive for years longer than their neighbors, and occasionally, a few imperiled trees manage to stay healthy even after exposure to the deadly pests or disease. The ability to resist infestation may be explained by the genetic makeup of these lingering trees. The USDA Forest Service is collaborating with universities and research organizations to identify and monitor trees that survive pathogen attacks with hopes of finding genetic clues that will facilitate the breeding of trees that are resistant to invasive threats. Research agencies that focus on tree species found in North Carolina that are partnering with the USDA Forest Service are The Hemlock Restoration Initiative, The American Chestnut Foundation and the Forest Restoration Alliance.

Science educators, student science clubs, and individuals interested in helping imperiled forests by identifying and locating trees that survive infestation are encouraged to visit the TreeSnap site (TreeSnap - Help Our <u>Nation's Trees!</u>) and use the free iPhone or Android TreeSnap app.

2024 Raffle Prizes





# **NCSTA Elections**

Elections for NCSTA officers and district directors is open until 10/30/2024. To vote, log into <u>www.ncsta.org</u> using the email address in your online profile and password. Once logged in, you will see the voting link above your profile.



# Hubert and Sheets Complete NC Environmental Education Certification

The North Carolina Science Teachers Association congratulates Adam Hubert and Dena Sheets upon their recent completion of the North Carolina Environmental Education Certification Program. Your commitment to expanding your professional knowledge and teaching skills is commendable.

Adam Hubert, a middle school science teacher at Hope Academy GSO, credits the NC Environmental Education Certification Program with providing him opportunities to see the beauty of North Carolina, connect with other like-minded professionals and think



creatively about ways to get his students engaged with the natural world. He states that his experiences while pursuing the certification, particularly snorkeling with hellbenders in the Blue Ridge mountains and participation in research on the Neuse River Waterdog, impacted on his perceived role as an educator

In relationship with the Piedmont Land Conservancy, Adam helped establish a cover board research transect at Knight Brown Nature Preserve as his community partnership project. Learning that there was no formal data collection on the vernal pools existing on the Preserve, Adam saw an opportunity for his 8th grade students to have a real-world experience collecting data and caring for the environment. Under his guidance, Hope Academy students began collecting data and documenting amphibian breeding during the spring and fall at the vernal pools. This monitoring will become an ongoing learning experience for the Hope Academy students.

Adam says the program enhanced his professional skills, introduced him to a wide range of instructional resources and engaged him in activities where effective teaching strategies were modeled. He says that he now views teaching environmental issues differently. Instead of bombarding his students with the environmental crises occurring on the planet, he focuses on building with his students a valued connection and concern with the environment. **Dena Sheets** serves as an Envirothon Advisor to middle school students and is an elementary teaching assistant at Piney Creek School in Alleghany County. Dana says her favorite thing about earning the NC



Environment Education Certification is "being able to share what I have learned with the students". She also praised the program for providing her opportunities to explore the state with other environmentally conscious professionals. A workshop at Fort Macon State Park where she worked with others to develop imaginary beach developments, and an outing at Carolina Beach State Park which included crabbing in the marsh and locating Venus flytraps, were her favorite learning experiences.

Dena did a "From Seed to Plate" educational program for her community partnership project. Through a partnership with Piney Creek School and the NC Cooperative Extension she promoted an awareness of plant growth and food production. Dena provided materials and assistance for teachers and students to start vegetables and fruits from seeds and later to transfer the resulting plants to outside raised-bed gardens. Crediting the certification program with changing her approach to teaching, Dena now believes students have greater interest and retain more information when given opportunities to engage in hands-on learning experiences. She also states the program has expanded her personal knowledge regarding the environment and made her aware of the many factors beyond weather and physical changes that impact the natural world. Dena states that completing her certification has created a desire to generate with her students an interest and passion for the outdoors.



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Save Time

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Engage your students with Plasma Games resources and digital interactive activities - you have ACCESS! Plasma Games is grant funded through DPI making it available to your district at no cost. Sci-Ops: Global Defense is statistically proven to improve learning, motivation and confidence in 6-12 middle school, chemistry, and physical science courses..



**SIGN UP** for a webchat today to learn how to gain access to the Plasma Games platform and get details about how to apply for our NCDPI grant!



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#### Look Up r Moons and Meteor Showers are among the intere

Super Moons and Meteor Showers are among the interesting celestial events that can be viewed this fall.

**October 17- Supermoon, full Moon:** As the Moon will be located on the opposite side of the Earth as the Sun its surface will be fully illuminated. This full moon was known by early Native American tribes as the Hunters Moon as at this time of year leaves have fallen and game is fat. This is the second of three supermoons for 2024. It will be near its closest approach to the Earth and may look slightly larger and brighter than usual.

**October 21-22** - **Orionids Meteor Shower:** This is an average shower producing up to 20 meteors per hour at its peak which will be on the night of October 21 and early morning of October 22. It is produced by dust left by comet Halley. Meteors will radiate from the constellation Orion.

**November 1** - **New Moon:** The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. Weather permitting, this will be a good night to view other celestial bodies.

**November 4-5 - Taurids Meteor Shower:** This is a long-running minor meteor shower producing only 5 to 10 meteors per hour. It is unusual in that it consists of two separate steams. The first is produced by dust left behind by Asteroid 2004 TG10. The other stream is produced by debris left by Comet 2P Encke. Meteors will radiate from the constellation Taurus. Best viewing will be just after midnight on the 5th. Reflected light from the first quarter Moon may block all but the brightest meteors.

November 15 - Supermoon, full Moon: This is the last of 3 supermoons for 2024 and as it is near its closest approach to Earth, it may look slightly larger and brighter than usual. Native Americans called it the frosty Moon or the Beaver Moon because this was the time of year to set beaver traps before waterways froze.

**November 16 - Mercury at Greatest Eastern Elongation:** Mercury reaches its greatest eastern elongation of 22.5 degrees from the Sun. This will be the best time to view the planet as it will be at its highest point above the horizon in the evening sky. Look for it low in the western sky just after sunset.

**November 17** - **Uranus at Opposition:** Uranus will be at its closest approach to Earth and its face will be fully illuminated by the Sun. it will appear blue-green and will be brighter than any other time of the year. It will be visible throughout the night but will appear as a small green dot unless viewed through a powerful telescope.

November 17-18 - Leonids Meteor Shower: The Leonids runs annually from around November 6th to the 30th with the night of the 17th and morning of the 18th being its peak period. This is an average shower producing up to 15 meteors per hour at its peak. The Leonids shower is produced by dust left behind by comet Tempel-Tuttle and will radiate from the constellation Leo.

**December 1** - **New Moon:** The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. Weather permitting this will be a good night to view other celestial bodies.

**December 7** - **Jupiter at Opposition:** Jupiter will be at its closest approach to Earth and its face will be fully illuminated by the Sun. The giant planet will be brighter than at any other time of the year and will be visible all night long. A good pair of binoculars should let you see Jupiter's 4 largest moons which will appear as bright dots on either side of the planet. Using a medium-sized telescope, one should be able to view and photograph Jupiter and its moon in some detail.

**December 13-14 - Geminids Meteor Shower:** This shower runs from December 7th to the 17th with its peak during the night of the 13th and morning of the 14th. It is produced by debris left behind by an asteroid known as 3200 Phaethon (discovered in 1982). The Geminids radiate from the constellation Gemini and is sometimes referred to as King of the Meteor Showers" At its peak it can produce up to 120 multicolored meteors per hour.

**December 15 - Full Moon:** The Moon will be located on the opposite side of the Earth as the Sun and its face will be fully illuminated. It was known by early Native American tribes as the Cold Moon.

**December 21 - December Solstice:** The South Pole of Earth will be tilted toward the Sun, which will have reached its southernmost position in the sky and will be directly over the Tropic of Capricorn at 223.44 degrees south latitude. This is the first day of winter in the Northern Hemisphere and the first day of summer in the Southern Hemisphere.

**December 21-22** - **Ursids Meteor Shower:** This is the peak of the Ursids meteor shower. It will produce 5 to 10 meteors per hour radiating from the constellation Ursa Minor. It is produced by debris left behind by the comet Tuttle.



# What Did You See?

Hold on! Did you say you were in the North Carolina mountains and saw an ARMADILLO? As strange as this may seem, the North Carolina Resource Commission has been tracking the occurrence of the state's newest resident mammal. The nine-banded armadillo (Dasypus novemcinctus) originated in South America but has slowly expanded its range since the 1700's. It first entered Mexico, crossed the Rio Grande in the 1800's, spread steadily northward across our southern states during the 1900's, and finally reached North Carolina in 2008. Confirmed sightings by way of carcass or photograph have occurred in 28 North Carolina counties. As of today armadillos are established, breeding and birthing in six southwestern counties: Transylvania, Swain, Macon, Clay, Jackson, and Cherokee. Road construction, forest clear cutting, and land clearage for farming has removed natural obstacles, facilitating the northward expansion of these interesting creatures. They are good swimmers and can cross water by holding their breath for several minutes and filling their stomachs and intestines with air for buoyancy. Thus, they are able to use rivers and streams as passageways.

Armadillos are "ecosystem engineers", changing habitats through their foraging and sheltering habits. They dig through the soil searching for grubs and worms. They also create burrows for shelter and protection from cold temperatures. These borrows are often shared by reptiles, amphibians, birds and other small animals. Whether armadillos will continue to expand their range will be determined by the severity of cold winters and their ability to penetrate the soil.

Most interactions between humans and armadillos are harmless, but their digging can destroy landscaping and damage tree roots. Although relatively uncommon, less than 10%, these mammals can be infected with Hansen's disease/leprosy. If you come in contact with an armadillo you are cautioned to wear gloves or avoid touching them. Email armadillo@ncwildlife.org with a photograph, date, time of observation and location if you encounter this animal in the wild.



# District Highlights

**District 1: Student Competitions Showcase Innovation and Excellence:** Students across District One are actively engaging in various STEM-based competitions that highlight their creativity and problem-solving skills. Teams are gearing up for the upcoming FIRST Robotics competitions, where they'll design and program robots to tackle complex challenges. In addition, students are preparing for the North Carolina Science Olympiad, with participants from elementary, middle, and high schools competing in events that test their scientific knowledge and abilities. We are incredibly proud of the dedication and hard work of the teachers, families, and volunteers who make these competitions possible, helping foster a spirit of innovation and collaboration.

**New Science Standards Bring Fresh Focus to Classrooms:** This school year marks the implementation of the new North Carolina K-12 Science Standards. These updated standards, designed to incorporate current scientific research and real-world applications, emphasize inquiry-based learning, critical thinking, and the integration of technology. Across District One, teachers are bringing these standards to life in their classrooms, ensuring students are well-prepared to tackle modern scientific challenges. A key feature of the new standards is their focus on cross-disciplinary connections, encouraging students to apply the scientific method to projects that involve engineering, technology, and mathematics. This holistic approach not only enhances their understanding of science but also equips them with the skills needed for a wide range of STEM careers.

**Professional Learning Opportunities for Educators:** Teachers are eagerly anticipating the upcoming NCSTA Professional Development Institute (PDI), with some preparing to present their own work. We also look forward to honoring the District One Outstanding Science Teachers at the awards ceremony on November 7, celebrating their contributions to advancing STEM education.

**Looking Ahead:** As we progress through the school year, we are excited to see how the new science standards and professional development initiatives will continue to enrich students' learning experiences. We encourage educators, students, and the wider community to stay engaged as we work together toward excellence in STEM education.

District Highlights continued...

District 2: UNCW's Center for Education in STEM (CESTEM) offered professional development during the summer for integrating the use of technology in the classroom. One workshop, sponsored by a grant from The Friends of UNCW, highlighted the integration of Science and Engineering Practices (SEPs) in K-2 using Storytime STEM kits. The kits are available for teachers to borrow for free from CESTEM's Technology Loan Program.

Onslow County provides professional development support sessions through their multi-year STEM grant. This year's focus is 6th grade science, but any middle school science teacher is welcome to participate.

The Center for Inquiry Based Learning provided a free workshop at UNCW on October 2nd. This session was for district teams to explore the Center for Inquiry Based Learning Student Activity Packs that are easy to use and with standards aligned.

District 5: The Greensboro Science Center is offering a Free Project Wild Workshop for teachers at the Center, on November 5, 2024, 9:00 AM to 3:15 PM. Many of the lessons offered align with the new science standards. <u>CLICK HERE TO REGISTER</u>.

Throughout the year the Greensboro Science Center also offers Sensory Nights. To learn more: https://drive.google.com/file/d/1FfSctJB1ggP81khfJ6twLaGQiEJv-j1n/view?usp=sharing

NC GreenPower's Clean Energy Education Program is a STEM-based initiative that brings exciting and engaging energy curriculum to the classrooms of North Carolina teachers. Aligned with North Carolina State Science Standards, this new program combines educator professional development, hands-on classroom activities, and classroom mini grants to enhance the experience of all students and expose them to the energy field and STEM. All K-12 schools are encouraged to apply for this opportunity! Participating schools are invited to take part in energy education workshops where they will receive STEM kits for their classrooms. Classroom kits will engage students in the science of energy and how energy impacts their life daily. Schools will receive: ·Professional development for a team of educators.

Hands-on classroom kits on energy transformations, renewable energy, and energy efficiency.
Materials to conduct an energy fair for their community.
The opportunity to apply for a classroom supply mini grant.
An educational energy audit for students with one of NEED's Certified Energy Managers.
To learn more and apply <u>click here</u>





NCSTA recognizes our 2024 PDI sponsors for their support and on-going commitment to enhance science teaching and learning in North Carolina. Their advocacy and contributions are greatly appreciated.



# **Teaching Tip: Discrepant Events**

#### Submitted by: Mary Ellen Durham

Research supports the use of discrepant events as an effective strategy for teaching science. Discrepant Research supports the use of discrepant events as an effective strategy for teaching science. Discrepant events are typically demonstrations that result in unexpected, counterintuitive outcomes that prompt students to ask "why" in real and meaningful ways. Discrepant events also help teachers assess and target learner preconceptions. When faced with an unexpected outcome, students experience cognitive conflict where they are forced to reconsider their preconceptions in light of new evidence. This leads to conceptual change and learning. Discrepant events promote student curiosity, questioning, discussion, and debate leading to critical thinking. Two suggested discrepant event demonstrations follow. If these strategies are included in your lesson plans, remember to follow the proper equipment and safety guidelines.

## Discrepant Event Demonstration #1 Miscibility (High School level)

Materials: 4 graduated cylinders, water, ethyl alcohol, gallon jar, marbles, tennis balls

1. Fill 2 graduated cylinders with 20 ml water (you may tint with food coloring) and 2 graduated cylinders with 20 ml ethyl alcohol.

2. Have several students examine the cylinders to confirm there is exactly 20 ml of fluid in each.

3. Have the students identify how many milliliters of fluid they should have if the two fluids are joined. (The answer will probably be 40 ml.)

4. Pour 20 ml of ethyl alcohol into one of the graduated cylinders containing water and wait a few seconds. 5. Have the students read the markings on the cylinder to measure the volume of the mixture. (It will be less than 40 ml).

6. Have the students speculate why there is less than 40 ml when the two fluids are combined.

7. Repeat steps 1 to 4, but this time pour the 20 ml of water into the cylinder of ethyl alcohol.

8. Have the student read the marking on the cylinder to measure the volume of the second mixture (It will be 40 ml)

9. Allow for student comments, but do not explain. Instead, drop 6-8 tennis balls into a clear gallon jar. Then add 20 marbles. Simply ask where did the marbles go?

Guide the student discussion to consider the size of the water and ethanol molecules. Ethanol molecules are smaller than water molecules, so when the two liquids are mixed, the smaller molecules fall between the spaces left by the water. Fluid volumes (liquids and gases) are not necessarily additive. As an extension to the discussion, you can introduce intermolecular forces (Hydrogen bonding and dipole/dipole forces) as also playing a role in the miscibility (mixability) of the fluids.

#### Discrepant Event #2 (Middle School Level)

Materials: large sturdy candle, lighter, long handled metal mesh strainer



1. Secure the candle in a location visible by all students. Placing it in front of a dark background will help the students see the event.

2. Have the students confirm that there are no linings or barriers across the mesh of the strainer by blowing air or pouring water through it.

 Light the candle, letting it burn with a tall visible flame.
 Challenge the students to identify how to position the mesh part of the strainer over the lit candle so that the flame can be seen under, through and over the mesh. Practicing safety guidelines, and following the students' suggestions, the teacher or a student positions the strainer over the candle flame in an attempt to have the flame visible below, through and above the mesh.

The students will soon realize that no matter how the strainer is positioned they will not see the flame pass through the mesh so that the flame is visible both below and above the mesh. Allow for student questions and explanations as to why the flame does not pass through. Carefully let a student examine the strainer to see where discoloration from the flame has spread (It may even feel warm to the touch). The energy from the flame has been conducted by the metal wire composing the mesh. This serves as an introduction to conduction, a characteristic of metals



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