



**VAST's Vision:**  
**Excellence in Science Education**  
**Through Innovation**

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# The Science Educator

Winter, 2024

A Publication of VAST, The Virginia Association of Science Teachers

Vol. 72, No. 3

## Remembering November 2023 PDI



**RISE Award Winners. See the list of winners on [page 15](#).**  
**See more PDI 23 photos inside.**

**Welcome to 2024!**

**2024 Annual In-Person Professional Development Institute**

**PDI Theme:**

**Global CSI:**  
**Curiosity.**  
**Science.**  
**Inspiration.**



**Date:**

**November**  
**14, 15, 16**  
**2024**

**Location:**

**DoubleTree**  
**by Hilton,**  
**Williamsburg**

## New Year Thoughts —



Susan Booth

As I continue to be your Executive Director, I cannot explain how honored and humbled to be a member of VAST. This past November was a blast and re-energized me for another year. I have learned so much and continue to grow and change to be the one of the best from your support and shared knowledge.

We continue to serve our students, parents, and community to exemplify the best of the best. We continue to empower each other into the leaders that the Commonwealth needs. But we still want to continue to share our passion to grow teachers and ourselves.

Times really don't change. Needs don't really change. What is important to you doesn't really change either. So, I ask you this year to make it your mission to support the VAST mission and make a difference.

*Susan Booth*

Susan Booth, Ed.S., VAST, Executive Director  
Fellow, Virginia Academy of Science

### *Mission of the Virginia Association of Science Teachers (VAST)*



- *inspire students,*
- *provide professional learning opportunities,*
- *build partnerships,*
- *advocate for excellence at the school, local, state and national level.*

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# Happy New Year 2024



Welcome to an exciting new year filled with promises of great opportunities! I hope that your winter break offered you some time to relax, reconnect, reflect, and rejuvenate. While all those words begin with re- (v., to do again), I'd like to add one more: refresh! It is so awesome that we were able to experience our recent Professional Development Institute (PDI) in Roanoke and reinvigorate (!) our teaching through all the wonderful sessions, exhibitions, and speakers. Your presence and participation directly contributed to the event's success... and inspired our wonderful PDI committee to think BIG for our 2024 PDI in Williamsburg, VA, November 14-16. Go ahead and mark those dates on your calendar now as it is going to be a great one too!

Science is the best lens through which all subjects can be taught. We, as science teachers, know this. Science explains, after all, the first question children ask and wonder about the answer. What is that question? I'm sure that you know it well... "Why?" In addition to parents, we are the ones who can answer this question often and best. We become science teachers! We desire to share our knowledge with the next generation and continually learn. This is the driving purpose behind our organization – to help support teachers and science education. I am so glad that YOU are part of it!

Education is one of those fields in which one can never be bored – unless, of course, you are comfortable in your spot and don't desire to change anything. This year, I challenge you to grow in your own practice of your craft. You will stretch yourself into a growth mindset and your students will respond as well. Think outside the box! Go outside...explore... wonder... sketch! Try a new format for teaching your favorite science topic! For example, if you've always rolled cars down a ramp and timed them, why not try

rolling them down the ramp with different types of surface materials while timing them? Or, have you tried an effective strategy such as hands-on activities, project- or problem-based learning, or inquiry driven investigation? Partner with another classroom in your school for learning! THINK and DO globally!

A global education is one that incorporates learning about cultures, issues, and interconnectedness of people – critical as barriers between nations fade. It develops students' skills to engage with their global peers and develop skills to be compassionate citizens, understand multiple perspectives, and analytically think about the world. Teachers are critical to creating these meaningful learning opportunities which all students deserve.

As a military spouse, we traveled quite a bit and made friends globally. Our mobile lifestyle led us to homeschool our children for a number of years and curriculum sequence continuity was important. A strong benefit was the education gained from their global connections to diverse people and places. I continued that type of learning when I transitioned into traditional public-school teaching.

From experience, I know that students can use these experiences to understand the world and their place in it. In short, they learn to understand their "why", find a purpose, and learn how they can be an educated citizen in an increasingly global world. In 2024, we'll journey along with Global C.S.I. Curiosity. Science. Inspiration. That's what we're all about. Join me as we venture forth!

*Lori Pawlik*

**2024 VAST President**





## Advocacy: VAST Stands for You!

### Eric Rhoades, VAST President-elect and Advocacy Chair

Advocacy serves as a potent force for the changes we aspire to achieve. It enables us to actively shape and enhance laws, policies, and systems that directly impact the communities we are dedicated to serving. We are often the most powerful advocates available to legislators because we are the ones in the classroom and feel the impact of changes in policies that are often decided by others. This unique vantage point renders us compelling agents of change, wielding persuasive voices that resonate.

VAST's initiatives in the policy align with our core mission and are propelled by the policy priorities of our Board of Directors—priorities influenced by your input. Early action by the VAST Advocacy Committee aimed to engage our entire membership, allowing us to collectively steer our advocacy efforts. Recognizing the pivotal role of educators as experts in teaching and learning, we highly value the insights you shared through the survey. These inputs will guide the work of both the Board of Directors and the Advocacy Committee in the coming year. Your participation in the VAST Advocacy Survey is deeply appreciated, and we eagerly anticipate sharing the results and advocacy priorities in the upcoming issue of the VAST Newsletter.

VAST has also recently collaborated with a coalition of organizations to draw attention to the accelerated review and implementation timeline for science standards. While the Board of Education approved a timeline for implementation in the school year 2027-2028, the Virginia Department of Education has expedited the schedule by two years, proposing implementation for 2025-2026 (available [HERE](#)). Ultimately, we recommend that the Board maintains its original decision for implementing the science standards in 2027-2028, and we will keep you updated throughout this process. VAST understands the challenges this may cause for science educators. We will be your voice and keep you posted.

The Advocacy Committee is also seeking to fill four additional seats to allow each region's representation on the committee (Region 2, 3, 7, and 8). Please contact me at [president.elect@vast.org](mailto:president.elect@vast.org) if you are interested in serving on the Advocacy Committee. The VAST Board of Directors and VAST Advocacy Committee are committed to advocating for what is best for students and teachers. It is one of the remarkable benefits of being a VAST member!

*Eric Rhoades*



Congratulations to the RISE Award winners. See the list of winners on [page 15](#).

# Benefits of VAST Membership

Mini-grants • Social Media • Professional Development • Awards • E-notes • Networking

Welcome to 2024! Being a member of VAST has many benefits! If you attended the 2023 VAST PDI, your membership was automatically renewed. If you weren't able to attend and haven't renewed, please do so! You do not want to miss out on all that VAST has to offer!

The Virginia Enrichment Repository for Science Educators, VERSE, is available to all members. It is being updated and 'tagged' with content and grade level identifiers to help target both your interest and learning. It is still draft and a work in progress. It includes content from VAST's *The Science Educator* newsletter, the *Journal of Virginia Science Education*, and sessions from the VAST Virtual Fall Professional Development Institutes (2020-2023). Explore VERSE by logging in to the [VAST web](#) and go to: [VERSE](#).

[Journal of Virginia Science Education, JVSE](#), is a peer-reviewed professional journal produced by VAST. The principal criterion for the acceptance of a manuscript is that it contributes to strengthening the teaching and learning science. Teachers-to-be, educators of all levels, school administrators, and informal science educators are invited to submit papers to be considered for publication in *Journal of Virginia Science Education*.

[The Science Educator](#) is full of information on national science education news; Virginia Department of Education happenings; announcements from partnering organizations; news from VAST regions; innovative science teaching strategies; grant information; professional development opportunities, workshops, and courses; and award information and applications. It is published five times each year. All members should receive a link to the current issue in January, March, May, July, and October in an email.

The VAST website, [VAST.org](#) contains the most recent news and updates. When VAST



members login to the website they have access to [VERSE](#) and [archives of Journal and Newsletter](#). There you may renew your VAST membership; check your membership status; and update your membership information.

[Recognition In Science Education \(RISE\) Awards](#) are presented to spotlight the excellent work done by science educators across the Commonwealth. They recognize service to science education in the individual's school, school system, and the VAST region in which they work. The awards are grouped in to twelve distinct categories. **Winners 23 are listed on page 17**

[Donna Sterling Exemplary Science Teaching Award](#) - Donna Sterling was a visionary science educator with a passion for working with science teachers and developing habits of inquiry-based teaching. Most recently, her leadership in the **Virginia Initiative for Science Teaching and Achievement (VISTA)** focused on teacher professional development. In 2024, the award will be given to an exemplary elementary teacher. See more information on the Sterling Award on [page 14](#) and on the [vast web](#).

[VAST Mini-grant](#) program provides seed money for innovative curriculum activities which expand learning opportunities for science students. Team or individual applications are welcome.

Your membership in VAST is your portal to resources, discounted conference rates, and connections to other science teachers in Virginia. Be sure to renew your membership so that you do not miss out on all the resources that VAST has to offer. YOU are important the VAST Science Community! Encourage your colleagues to join. Why not gift a new colleague or your student teacher? [Membership](#)



# Unleash the Power of Exploration

**Eric Rhoades, VAST President Elect and Advocacy Chair**

Greetings, fellow educators! As we begin the new year, it's time to infuse our classrooms with excitement and engagement. What if we told you that exploring before explaining is the key to unlocking your student's potential? Hands-on experiences are the catalyst for profound learning in science.

Maximizing every precious hour, I am encouraging an explore-before-explain mindset. Imagine a classroom where students aren't just passive recipients of knowledge but active participants, delving into the wonders of science through firsthand experiences. Picture this: once your students have taken the plunge into exploration, explanations follow naturally, at the perfect moment for optimum understanding.

Becoming an explore-before-explain teacher isn't just a change in approach; it's a mindset shift. Here are four practical suggestions to revitalize curriculum planning and instructional design:

1. **Plan Backward:** Start your journey by planning with the end in mind. Identify phenomena to engage your students, ensuring your teaching focuses on developing students' conceptual understanding of engaging current science. It's more than just the classic baking soda and vinegar experiment; it's about guiding students to construct evidence-based claims, fostering a deep grasp of scientific principles.
2. **Engage Students' Ideas:** Every student brings a unique set of experiences to the classroom. Begin your lessons by tapping into their ideas and experiences, creating a need-to-know situation that ignites curiosity and allows for collaboration and communication. Whether predicting marble trajectories or debunking misconceptions about

sinking and floating, let students explore before explaining. Watch as their initial ideas or models evolve into evidence-based claims, setting the stage for enhanced understanding.

3. **Enhance Understanding:** After the exploration phase, guide your students in explaining their conclusions and transferring their newfound knowledge. Plan activities that fill gaps in their understanding, introducing scientific vocabulary and concepts that enrich their explorations and make sense of science. Readings, discussions, and lectures become more than just components of a lesson; they're rich learning experiences that connect ideas and frameworks.
4. **Promote Reflection on Learning:** Our planning should offer students opportunities for metacognition—thinking about what they've learned and how far they've come intellectually. Through self-assessment, students can evaluate their performance, reflect on challenges, and consider strategies for improvement. It's not just about grades; it's about cultivating a continuous improvement mindset.

Embarking on this journey may take time, but fear not! Start with a tried-and-true, hands-on activity that sparks accurate scientific understanding. Shift your instructional script to explore before explaining, a strategy that benefits both new and experienced teachers alike.

As we usher in a new year, let's embrace the power of exploration in our classrooms. Together, we'll create memorable and impactful learning experiences that inspire a lifelong love for science. Happy exploring!



## Meet Your New Region I Director Amber Rhodes

I am thrilled to introduce myself as your Region 1 Director for the Virginia Association of Science Teachers. My name is Amber Rhodes, and I am honored to serve the vibrant community of educators in the Richmond area and its surrounding counties (Region 1).

In my nine years of teaching experience, I have witnessed the transformative power of science education. From engaging hands-on experiments to thought-provoking discussions, our classrooms are where curiosity is sparked, and minds are ignited. However, I also recognize the challenges we face in providing the best possible learning experiences for our students.

As your representative, my primary goal is to strengthen the Region 1 science community and to advocate for the needs and interests of science teachers in Region 1. We are always better together! By collaborating, educators, administrators, and stakeholders can create an environment that supports professional growth, provides access to cutting-edge resources, and ensures that science education remains a top priority in our schools.

Throughout the year, I will be actively seeking your input and feedback on the issues that matter most to

you. Whether it's sharing successful teaching strategies, addressing curriculum concerns, or advocating for resources, I am here to amplify your voice and work towards solutions that benefit our entire community.

Additionally, I am committed to organizing professional development opportunities, workshops, and networking events that allow us to learn from each other, share best practices, and build a strong support system. By fostering collaboration and camaraderie among science educators in Region 1, we can create a dynamic community that empowers us all to excel in our roles.

I am excited about the potential that lies ahead for our region, and I am confident that, together, we can elevate science education to new heights. Feel free to reach out to me at [region1@vast.org](mailto:region1@vast.org) with any questions, suggestions, or concerns. Your insights are invaluable, and I look forward to working collaboratively to make a lasting impact on the future of science education in Central Virginia.

Thank you for entrusting me with the privilege of representing Region 1. Let's embark on this journey together and make a positive difference in the lives of our students.



## Congratulations: to the Newly Elected VAST Board Members

At the 2023 PDI the following Regional Directors were elected for the regions I, III, V, and VII. Elections for Regions II, IV, VII and VIII will be held in November 2024.

**Region 1 - Amber Rhodes**

**Region 3 - Margaret Greene**

**Region 5 - Dr. Robbie Higdon**

**Region 7 - Jinx Rasmussen**

**President-Elect - Eric Rhoades**

**Treasurer - Dr. Paula Klonowski Leach**

## Teaching is NOT Mission Impossible: Surviving the Return from Winter Break

By Robbie Higdon, VAST Colleges and Universities chair and Morgan Meadows, Partner Engagement Administrator: VA, MD, & DC, American College of Education

For many of us, the winter break holiday arrived just in time to save our personal health and sanity. We have survived that pre-holiday period of having our calendars filled with student performances, school assemblies, and end-of-the semester grading while squeezing out time to decorate our homes and shop for presents. And, the turn of the calendar to a new year means a return to our students and daily classroom routines. We may greet our same group of students or meet a new group of students as the school doors open.

For some of our students, the extended break from school meant a disruption to the order and structure our classroom environments provide them. Students might have spent their vacation time being shuttled from one family member to another or taking on extra hours or shifts at their jobs. Other students may have had long periods of unstructured/unsupervised time as parents and caregivers had to work without having access to reliable child care. In any case, it is just as important to take into account the need to establish and/or re-establish your classroom norms upon the return to school from an extended break as it was at the start of your school year.

Many students experience feelings of anxiety or uncertainty when they do not know the expectations and procedures of your classroom thus fostering behaviors to deflect these feelings upon others. Winter break can be a period of time during which students will forget some of the classroom norms as they are not in a day-to-day routine. Upon your return from the break, you may observe students who were withdrawn or hesitant in their classroom behaviors now being outspoken or disruptive and vice-versa. These could be signs that your students need a review of the classroom expectations and procedures. For Robbie, her middle school students would be quite anxious about forgetting their locker combinations (yes, I am dating myself here!) upon coming back from the winter break. And, until we resolved these issues, they would be buzzing and interrupting me with their concerns.

So, I would also allocate time on the first day to remind each student of their combination and allow them to go out to their lockers (in small groups!) and try to open their lockers without the pressure of having to do so during a class change. Yes, giving students the time to “practice” opening their locker did not align to any of the science curriculum standards; however, I knew that no learning would take place that day until we had addressed these concerns.

Here is a link to a site that provides more information on building community in the classroom through establishing procedures:

[https://www.collaborativeclassroom.org/blog/classroom-community/#:~:text=We%20want%20our%20children%20\(all,continue%20to%20learn%3B%20a%20community](https://www.collaborativeclassroom.org/blog/classroom-community/#:~:text=We%20want%20our%20children%20(all,continue%20to%20learn%3B%20a%20community)

Here is link to a site that discusses the importance of establishing classroom norms:

<https://teaching.cornell.edu/resource/getting-started-establishing-ground-rules>

Finally, give yourself permission to feel a bit of unease or anxiety as you return to the classroom after an extended break. Resist putting too much pressure on yourself to be “perfect” on the first day. Acknowledge your mistakes to your students; it will show them that you are human! Ask them to identify things that would like to change about their classroom environment or ask them to come up with a solution to that issue. Also, do not try to implement a great deal of changes; select one classroom norm or procedure that you would like to implement and give students at least a week to learn the new norms before implementing another change.

If you have a teaching tip or strategy you would like to share with our VAST readers, please email Robbie Higdon at [higdonrl@jmu.edu](mailto:higdonrl@jmu.edu) or Morgan Meadows at [morgan.meadows@ace.edu](mailto:morgan.meadows@ace.edu)

We look forward to hearing from you.



## Thank You, Exhibitors

# PDI Exhibitors 2023



3D Molecular Design

Accelerate Learning

American College of Education (ACE)

Busch Gardens Williamsburg

Cengage

Center for the Advancement of Sustainable Energy  
at JMU

Chesapeake Bay Foundation (CBF)

Chesapeake Bay National Estuarine Research  
Researve

CodeVA

Colonial Williamsburg Foundation (CWF)

Dan River Basin Association

Data Classroom

Discovery Education

Eastern Mennonite University (EMU)

ExploreLearning

Five Ponds Press

hand2mind

I.Miller Microscopes

Inquisitive

James River Association

National Geographic Learning

Nauticus

mheducation

miniPCR

microscope solutions

Old Dominion University

PITSCO

Project NEED

SAVVAS

School Specialty LLC

Science Museum of Virginia (SMV)

Science Museum of Western Virginia (SMWV)

Strawbees

Texas Instruments (TI)

Vernier

Virginia Agriculture in the Classroom (VAFB)

Virginia Association of Science Teachers (VAST)

Virginia Department of Aviation (DOAV)

Virginia Department of Energy (Virginia Energy)

Virginia Department of Forestry (DOF)

Virginia Department of Wildlife Resources (DWR)

Virginia Institute of Marine Science (VIMS)

Virginia Junior Academy of Science (VJAS)

Virginia Lottery

Virginia Museum of Natural History

Virginia Space Grant Consortium (VSGC)

Virginia Stem Scopes

Virginia Tech College of Natural Resources and  
Environment

Virginia Tech College of Science

Virtual Science Teachers

Ward's Science

WHRO

WorldStrides

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University**



**Virginia  
Lottery**



Interested in Sponsoring? [Click here for more information.](#)

## 2024 VAST Professional Development Institute

**“Global CSI: Curiosity. Science. Inspiration.”**  
**November 14, 15, 16, 2024**

Complete information about the 2024 VAST hotel can be found on the [Annual PDI page](#). Click on Hotel Information, Prices, Online Reservation Form, WiFi, Menus, and Parking.

The link to access the 2024 VAST PDI Double Tree reservation page is active.

Hotel Room rate: \$118.00  
+ 12% tax (\$14.16) +  
\$2.00 occupancy fee  
per night = \$134.16  
(The GSA per diem government rate may go



**Double Tree by Hilton, Williamsburg**  
**50 Kingsmill Road, Williamsburg, VA 23185**  
**phone: 757-220-2500**

up or down in August from this estimation.)  
Check for updates on the VAST website.

To register for hotel: VAST Hotel Reservation Link  
All reservations need to be booked before October 13, 2024 (based on availability). [Hotel Reservation link.](#)

Be sure to check the VAST Website for updates and over-flow hotels if they are needed. Meal Menus for the PDI, the hotel floor plan, WiFi and parking information are available on the website.

Go to the VAST Annual PDI page for up-to-date information.

## JVSE Update - January 2024

Dr. Angela Webb & Dr. Joi Merritt, JVSE Co-Editors

Shoutout to those who joined our session at the VAST PDI to learn more about writing and reviewing for the Journal of Virginia Science Education. If you're interested in becoming more involved with the journal, we invite all VAST members to volunteer to review submitted manuscripts. This opportunity is a service you can include on your resume and is a great way to get ideas for your own publications. If you're interested in serving as a JVSE reviewer, please scan the QR code and respond to a brief set of questions to (a) indicate your interest in reviewing 1-2 manuscripts this year, (b) update your contact information, and (c) share your areas of expertise and your professional interests.

The spring/summer 2024 issue of JVSE will include many of the manuscripts we received last year. Authors, you'll hear from us soon with feedback and the acceptance decision.

We encourage VAST members to consider submitting an article for our winter 2024 issue. The theme is STEM Across the Curriculum (submissions due July 31; published December 15). Manuscripts that address this theme may include innovative lessons/activities and research on integrated STEM, or ways to address challenges that may arise when integrating and addressing STEM in our science classrooms (PreK through post-secondary); etc.

Please visit the journal webpage to read current and past issues of JVSE and review guidelines for manuscript authors and reviewers.

**SCAN ME**



[\*Journal of Virginia Science Education, JVSE\*](#)



## Looking for Ways to Solve the Financial Challenge of Attending VAST

### Eric Rhoades, VAST President-elect and Advocacy Chair

In an ever-evolving world, science teachers play a pivotal role in shaping the future by inspiring the next generation of scientists, innovators, and problem-solvers. To ensure that science teachers remain at the forefront of their field and are equipped with the latest knowledge and teaching methodologies, it is crucial for them to attend professional development events like science conferences. The Virginia Association of Science Teachers (VAST) recognizes the importance of continuous learning and is dedicated to supporting its members in their professional growth. In this article, we explore ways to fund science teachers attending VAST, the significance of teacher funding for attending science conferences, and highlight how VAST's Professional Development Institute (PDI) is leading the way in empowering Virginia's science educators.

#### The Importance of Science Conferences:

Science conferences are dynamic platforms that bring together educators, researchers, and experts from various fields. The VAST PDI offers numerous benefits for educators, including:

1. **Up-to-date Knowledge:** Conferences provide access to the latest research, innovations, and trends in science education. Teachers can learn about emerging technologies and teaching strategies, ensuring their classrooms remain relevant and engaging.
2. **Networking Opportunities:** Educators can connect with peers, mentors, and professionals in the field, fostering collaborations and partnerships that can enhance their teaching practices.
3. **Professional Growth:** Attending conferences allows teachers to expand their horizons, gain new perspectives, and develop professionally. They return to their classrooms with renewed enthusiasm and fresh ideas.
4. **Inspiration:** Interacting with passionate individuals who share a common love for science can rekindle teachers' passion for their subject matter, which they can then impart to their students.
5. **Resource Acquisition:** Many conferences feature exhibitions where teachers can discover new teaching materials, textbooks, and resources for their classrooms.

#### How to Solve the Financial Challenge:

Despite the undeniable benefits of science conferences, one significant obstacle for many educators is the cost associated with attendance. Registration fees, travel expenses, accommodation, and other incidental costs can quickly add 12.

up, making it challenging for teachers to participate in these valuable events.

Teachers can seek funding from a variety of sources through their school or school division. Here are a few ideas:

1. Each school division has **Title II, Part A funding**. This federal funding source provides funding specifically for professional growth for teachers and administrators. All school divisions have a person in your division's central office responsible for ensuring teachers have funding for conferences and other professional learning opportunities. You can either search your school division website or the [Virginia Department of Education's school division directory](#) to find the person in your school division.
2. Many school divisions have a fund for reimbursing teachers for **tuition reimbursement**. School divisions often set aside a certain amount for each teacher. Some school divisions allow teachers to use this funding to support travel to conferences such as the VAST PDI. You can check with your Human Resources Department to determine if your school division has this available and how you can help access it.
3. **Schools may have funding** to provide registration and travel expenses to conferences. You may consider asking your Principal if they have funding to support this opportunity for you. You can bring back what you learn at the VAST PDI and share it with your colleagues. This often makes a difference in whether a Principal will support this travel experience.

Science teachers are the cornerstone of our society's scientific literacy, and their professional development is paramount. Attending science conferences is a vital aspect of their growth, enabling them to remain at the forefront of science education. The Virginia Association of Science Teachers' Professional Development Institute plays a crucial role in supporting Virginia's educators by offering financial assistance and ensuring that the state's science classrooms are enriched with the latest knowledge and teaching techniques. Through PDI's initiatives, VAST empowers its members to continue inspiring future scientists and innovators, fostering a brighter future for Virginia and beyond.

Eric Rhoades

Eric Rhoades, a long time VAST board member, has served as Secondary Science Educational Specialist for Henrico County), Director of Curriculum and Instruction for Richmond Public Schools, Director for Science and Health Education for VDOE, and Director for the Virginia Initiative for Science Teaching and Achievement at George Mason University.

## Announcing: Doctoral Graduate Assistantship in Science Education Virginia Tech School of Education

The Virginia Tech School of Education is seeking highly-qualified applicants for a Doctoral Graduate Assistantship in Science Education.

Responsibilities include: supervising, mentoring and evaluating pre-service teachers in their field placements, attending classes with pre-service teachers, grading class assignments, completing evaluations and entering data into the School of Education accountability system, occasionally teaching a graduate class and completing coursework toward doctoral degree. Relocation is necessary.

Qualifications:

Required

- A Masters degree or equivalent in Curriculum and Instruction or other related degree with specialization/ concentration in Science Education from an appropriately accredited institution
- At least three years teaching experience in Science Education at the middle or high school level
- Evidence of potential for scholarly research in Science Education

Preferred:

- Experience with pre-service or in-service science teacher education and supervision
- Experience in science education, research, and outreach
- Experience with and commitment to working with culturally diverse and/or international populations
- Experience with implementing the Next Generation Science Standards.

If interested, email a curriculum vita or resume to Dr. Brenda Brand at [scienceedu@vt.edu](mailto:scienceedu@vt.edu)

\*Acceptance is contingent upon an interview and admission into the Virginia Tech Graduate School.



## Global Science Curiosity and Inspiration Begins with YOU!

This year I hope you can see yourself in a leadership role for VAST. We know you are a dedicated leader, you are already a member of VAST. It's time to step further into your leadership role with VAST by joining our Board of Directors.

**Nominate someone, or yourself, for one of our open positions.**

**President-elect:** The President-elect shall serve as the co-Chairperson of the standing Professional Development Institute (PDI) of the year they will serve as President.

**Vice-President:** The Vice-President, as directed by the President, shall oversee all committees except the Executive Committee and Board of Directors; keep a log of meetings and activities of each committee; make the chairpersons aware of their responsibilities; remind the committee chairs of their expectations; see that the handbook is kept up to date; remind various leaders, especially new people, of their responsibilities; and advise the President as needed. The vice president shall be elected for a term of three years.

**Regional Director:** Regional Directors shall be elected from each of the eight (8) Department of Education regions. Directors shall be elected by the membership to serve a two-year term and may serve more than one term. Directors from even-numbered regions will be elected on even years, and those from odd-numbered regions will be elected on odd years. Directors will, within their region, promote VAST membership, regional professional development activities, and the VAST Professional Development Institute (PDI). Directors will serve as the coordinator of science leaders within their region and encourage an active and viable network within their region. Directors are expected to attend VAST Board meetings and provide a report on activities within their region. Directors shall actively participate as VAST leaders including contributing to publications, awards nominations, and the solicitation of presenters for the VAST conference.

Nominees may fill out an electronic form at: [2024 Nomination Form](#)

**Anne Petersen, Ph.D., Director of STEM**

With the New Year and spring approaching, I tend to think of change and renewal. Change can be intimidating but it can also lead to new opportunities and bring a sense of excitement. The VDOE Office of STEM is also facing change and is excited about what the future may bring when supporting teachers and leaders with science instruction. Below are some of the changes that 2024 brings to VDOE STEM and Science.

**The 2018 Science Standards of Learning Revision:** The standards revision process is underway and we need educators to inform the process! The standards revision process is informed by a variety of stakeholders; however, the experts in applying the standards to instruction are teachers.

Please consider applying to be on a grade level/course teacher revision committee. Committee applications will open in early February. Application information will be posted on the [VDOE Science Instruction website](#) and sent through [Science Update](#) and [Teacher Direct](#). If you do not receive these newsletters, please register through the links provided or through the VDOE website.

Teacher feedback on the 2018 Science Standards of Learning is critical to the revision process. What do you like about the current standards? What do you think should be changed or revised? Both types of feedback are critical to the revision work. You can provide feedback on the 2018 Science Standards of Learning using this [feedback platform](#).

**The 2025 Science Standards of Learning look is changing:** The leaf is migrating into the standard! The science concepts in the standards will remain the same and continue to reflect the most accurate and age-appropriate concepts at each grade level; however, the actual format of the 2025 Science Standards will look a bit different. The revised standards will migrate the Essential Knowledge and Practices into the actual standard.

The Office of STEM is undergoing transition: I am honored to announce that I have been promoted to the Director of STEM position. Eight years ago, I was brought on to the VDOE Science Team and I have served the past seven years as the Science Coordinator. I have been honored to work with many educators to support science instruction in the state. It is time for a fresh perspective on science education and the educators of Virginia deserve to have a leader with passion and drive to support them through the standards revision and implementation process.

We are currently in the hiring process for the Science Coordinator position, and we hope to have a person in place by the time this newsletter is published. Although I am leaving the Science Coordinator position, I am excited about supporting science in my new role.....STEM starts with Science!!!

## Download the Following Safety Manuals from the VDOE

[VDOE Science Teaching revised 2023.pdf](#)

[OSHA Lab Safety Guidance \(PDF\)](#)

[ACS Safety in the Elementary Science Classroom \(PDF\)](#)

[Safe Lab School Chemistry Laboratory Safety Guide \(PDF\)](#)

[Science Safety Self-Assessment Checklist \(PDF\)](#)



Plan to be there!!



*Busch Gardens*  
**CHRISTMAS  
TOWN™**

**PDI 24 we will have an evening @ Busch  
Gardens-Christmas Town on the evening of  
Friday November 15<sup>th</sup>, 2024.**

[Link](#)

**Thank You!**



**LONGWOOD**  
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**Friday, November 17, 23 (7-9pm)  
Science Museum of Western Virginia  
Viewing Party**

VAST thanks these supporters who sponsored the Friday night event at the PDI 23. We particularly enjoyed the upgraded planetarium, the EYE, as well as DJ Rodney and the opportunity to meet the VAST Regional Directors and representatives of Colleges and Universities.

# Elementary (K-6) Teachers: Apply for the 2024 Donna Sterling Exemplary Science Teaching Award



Donna Sterling

Donna Sterling was a visionary science educator with a passion for working with science teachers and developing habits of inquiry-based teaching. Her leadership in the Virginia Initiative for Science Teaching and Achievement (VISTA) focused on elementary and secondary teacher professional development. This award recognizes that exemplary teachers engage in continuous improvement and is designed to support a professional development plan for the improvement of science teaching.

In 2024, the award will be given to one exemplary elementary teacher (grade preK-6). 6th grade teachers in elementary settings are eligible to apply for this award.

The awardee will receive a total of \$4000; \$3000 at the VAST PDI in 2024, held in Williamsburg, VA November 13-16, 2024. The remainder will be awarded after the awardee presents at the next VAST PDI and submits an article to the newsletter The Science Educator or the Journal of Virginia Science Education. In addition, registration and travel costs will be reimbursed to attend the 2024 VAST PDI to receive the award and to the 2025 VAST PDI to present a session on the professional development experience and outcomes.

## Deadline for Applications

**August 16, 2024, 5pm**

## To Apply:

**Congratulations to Sterling Winners 2023**  
Congratulations to Patricia Gallop of Westhaven Elementary School and Lisa Laub of Amherst Middle School who were selected as recipients of the 2023 Donna Sterling Exemplary Science Teaching Awards. They will be honored at the VAST PDI Friday night Awards Dinner.

1. Provide a cover letter that includes your preferred name, your home and school addresses, phone number(s), and email address(es) where you can be reached. Tell us how many years you have taught, where, and what subjects and grade levels.
2. In no more than 2 single-spaced pages, describe an inquiry-based science unit that you have taught. Describe how your unit is student-centered and includes community engagement. Provide evidence that the unit was effective. Evidence documents such as student work can be submitted separately and do not count toward the two-page limit.
3. In no more than 2 single-spaced pages, describe your plan for professional development, using the funds received through the Sterling award. Plans may include summer courses, workshop attendance, study abroad, instructional material development under expert guidance, etc. Feel free to be creative in your plan. Submit the professional development description with anticipated outcomes, including plans for a presentation at the 2025 VAST PDI. Tell how this award will help you become a better science teacher and support the development of your leadership skills. Tell about your plans for writing an article about your experience.
4. Submit 3 letters of recommendation based on direct observations of your teaching. One letter must be from a science supervisor or someone serving in that capacity, a second letter must be from the principal, assistant principal, or instructional leader, and a third letter must be from a fellow teacher or a parent. Letters should address the following: Why is this teacher a good candidate for this award? What qualities do they exhibit as teachers that make the recommender think they will use the funds from the award to improve their practice as teachers of science?

**Email the complete application packet, including letters of recommendation and supporting materials to Dr. Jennifer L. Maeng, [jlc7d@virginia.edu](mailto:jlc7d@virginia.edu) with Sterling Award Application as the subject.**

# **2023 VAST RISE AWARDS and MINI GRANT**

## **Recipients**

VAST recognizes exemplary contributions to science education through its annual awards program. Awards are presented to outstanding educators at all levels. In addition, school administrators, and businesses are eligible to be recognized for their support of, and contributions to, quality science education.

The recognition consists of an attractive engraved plaque and reimbursement for the awards dinner and other PDI expenses up to \$400. The presentations are made as part of the annual PDI. VAST is pleased to recognize the following recipients for 2023. Please congratulate and thank them for their outstanding contributions to quality science education in Virginia.

### **RISE AWARDS**

Community Partner- Nauticus Maritime Discovery Center

Community Partner- Virginia Transportation and Construction Alliance, Rob Lanham

Science Educator, Informal Education, Krista Hodges Dan River Basin Association

Science Educator, Science Supervisor, Tom Fitzpatrick-Roanoke City Schools

Science Educator, Instructional Specialist, Emily Jarratt, Greensville County Schools

Science Educator, Esteemed Educator, Dr. Jason Calhoun, Governor's School

Biology Teacher, Gehrie "Mac" Bair, Harrisonburg High School, Harrisonburg City Schools

Physical Science teacher, Sarah Wicker, Holman Middle School-Henrico County Schools

Physics Teacher, Jon Collins, Amherst County High School, Amherst County Schools

Environmental Science teacher, Carrie McCrary, Snow Creek Elementary School, Franklin County Schools

Middle School, Scott Markley, Fred Lynn Middle School-Prince William County Schools

Elementary School, Keaton Beaumont, Dale City Elementary School, Prince William County Schools

At-risk Population Teacher, Beth Maupin, Brooke Point High School, Stafford County Public Schools

### **MINI GRANTS**

Lisa Laub, Amherst Middle School- Science is Electrifying \$700

Lorraine Kelly, Magna Vista High School- Hands on Biotechnology \$698

Luisa Hays, Franklin County High School- Environmental Activity Boxes \$332

Faith Grubbs, Salem Church Middle School- Weather Investigation \$393





# Virginia Junior Academy of Science

## Research Symposium Virtual

### Saturday, May 4, 2024 (Day of Presentations)

The Virginia Junior Academy of Science will hold its 2024 VJAS Research Symposium virtually on Saturday May 4, 2024. The purpose of this meeting is to give approximately 750 students in grades seven through twelve from throughout the Commonwealth the opportunity to present papers, which will report original research they have conducted. At least a month before the virtual presentations, judges will receive research papers to read and score online,

via the Reviewr web platform. On Saturday May 4, Judges will be asked to come at 8 am for a preliminary meeting than papers will be virtually presented every 15 minutes from 9:00 a.m. through 4:30 p.m. with a five minute break for judges to score. More information about the online judging process and virtual presentations including web links, will follow in early Spring.

## VJAS Has New Look This Year

We have a new look this year that we want to make you aware of as a Juried Symposium, a cornerstone of the Conference. Students may submit their papers for consideration, with the potential to become presenters. Even if their submissions are not selected, they are welcome to attend the event as attendees, gaining insights from presentations and speakers, all contributing to their educational growth.

VJAS distinguishes itself by offering students a unique opportunity to receive indirect and direct feedback. The event spans three significant days: the first day kicks off with a General Session Speaker, followed by the second day where students present their work, and all students can listen to speakers and gain insights

into attendee-only papers. The grand finale is the third day, featuring an awards ceremony.

The highest achiever at VJAS earns a coveted invitation to AJAS. Still, every participant reaps numerous benefits, including securing the VDOE Science Diploma Seal, engaging in state-level leadership experiences, publishing their work in the Proceedings or VOICE, accessing scholarships, and collaborating with mentors.

Please spread the word to get involved as a judge for the Virginia Junior Academy of Science.

To Link to more judging information :

[Click](#)

## STEMinar

**STEMinar will be held Sunday, February 4th.** Virtual sessions featuring VJAS student researchers, mentors, and judges are designed for students and teachers alike. [Register for STEMINAR](#) and stay tuned for

more information closer to the date!

To learn more about our annual symposium visit the [VJAS website](#) and read our quarterly newsletters.

## VJAS Mentorship for Your Students

Virginia Junior Academy of Science - Students in grades 7 through 12 are eligible to submit their scientific research papers to the 2024 VJAS Symposium. Membership in VJAS is now free. As members, students have the option to submit papers for consideration to become presenters at the Symposium or they may attend the event, gaining insights from presentations and speakers.

The competition is divided into separate categories for middle school students and high school students. The highest achiever at VJAS earns a coveted invitation to the American Junior Academy of Sciences. The deadline to register your school is January 15, 2024.

Susan Booth EdS

Fellow, Virginia Academy of Science

Table of Contents

# VAST PDI 2023 in Pictures







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1/05/2024

## Opening Gates: The Art of Teaching and Learning

The two most important days in your life  
are the day you are born, and the day  
you find out why.

— Mark Twain

The flame at the end of a three-foot Bunsen burner tube inched toward the upper tip of a pair of funnels which had been welded together and filled with hydrogen gas. Hydrogen gas is explosive, right? As students in the front rows of the lecture hall recoiled instinctively, the hydrogen ignited and burned quietly with a pale blue flame. Front rows relaxed a bit. Only a few seconds later the funnels jumped upwards from their ring stand as a thunderous explosion shattered the quiet, lights went out, and archival footage of the famous 1937 Hindenburg Luftschiff Zeppelin disaster played on the screen behind the lecture table. The correct proportion of hydrogen and oxygen had been achieved; science had come alive!

We had witnessed another lively lecture by our chemistry professor, Hubert Alyea – “Dr. Boom,” as we affectionately called him. Turning around as applause and cheers erupted, I saw the lecture hall completely filled by many other students who knew Dr. Boom’s reputation as “master of magic and mayhem” (as the *New York Times* once noted). But it was his energy and enthusiasm which affected us most.

Dr. Alyea’s famous lecture, “Lucky Accidents, Great Discoveries, and the Prepared Mind,” plus his development of the popular “armchair chemistry,” would open closed gates for many, as it did for me. Of course, science is rich with the discoveries made by prepared minds, as Pasteur once put it: from Fleming’s penicillin, to Banting, Best, and McLeod’s insulin, to Becquerel’s spontaneous radiation, the phenomena of X-rays and microwave background radiation, to archeological finds, Edison’s insights, plus post-it notes, slinkies, and silly putty.

Sometime later another quite different experience came as I watched my cellular biology professor [who had made the career choice to follow the melodies of research biology over studying with the famous Puerto Rican ‘cellist, Pablo Casals] as he played Saint-Saëns’ ‘cello concerto No. 1 with the University Orchestra. I can still remember details of the concert hall as I sat mesmerized by the artistic talents of our professor who was supposed to be a research scientist, not an artist. Significantly, I learned later that it was our university’s Mathematics Department members who would hold informal chamber music gigs, rather than the Music Department which was more engaged with the intricacies of 12-tone harmonies in serial composition techniques with the leadership of Milton Babbitt.

These were seminal experiences for me, showing both the art in science and the science in art. Yet, more significantly, they served to alter my perceptions in what would become my life-long love affair with teaching. I had often thought of teaching as a series of well-demarcated steps down roads where success would come if I learned the right passwords, avoiding gates which were closed due to other perceived interests, age, or ability. Gates would open once I possessed



Courtesy of verchmarco, licensed under CC BY 2.0

In any language, some gates are closed, reduced opening hours.  
Jardines de Alfàbia in Bunyola, Mallorca.



Courtesy geograph.org.uk – 1774418 by Andrew Wood, CC BY-SA 2.0

Some gates are open and lead to unlimited vistas and opportunities.  
The Open Gate by Andrew Wood



some magical power through examinations, credentials, or contacts. The kinds of open gate leading to incredible vistas of potential came only later after sufficient experiences had made me aware of the greater rewards from teaching: helping younger learners avoid bashing at locked gates and choosing instead the gates open to uncharted horizons.

During graduate studies in education, I had read Gilbert Highet's classic, *The Art of Teaching*. However, only after later experiences inside and outside the classroom did, I discover the truth in Highet's observation<sup>1</sup>:

"Wherever there are beginners and experts,  
old and young, there is some kind of  
learning going on, some kind of teaching.  
We are all pupils and we are all teachers."

To alter Mark Twain's remark, for many of us that second vital day may rather be the culmination of many days or even years of experiences with minds prepared for them.

An experienced physics teacher arrived the same year that I began my teaching in biology. In response to the 1957 Sputnik launch, the revised curricula in biology (BSCS), earth science (ESCP), chemistry (ChemStudy), and physics (PSSC) had just come out, and over the years I followed first the BSCS yellow (cellular), then blue (molecular), then green (ecological) versions. Leon was a staunch and trained advocate of the approach outlined in the PSSC physics curriculum, and nearly every afternoon his voice would summon me up the staircase, "George, you've **got** to see this!" "This" could mean some new apparatus he had just built, or one of the 16mm black and white films from PSSC, like the classic "Frames of Reference" featuring the Canadian scientists, Patterson Hume and Donald Ivy [Still available on YouTube and very much worth viewing.] For thirteen years this habit continued until Leon moved on and I was asked to teach the physics program in a new school. That 13-year tutorial (plus additional courses) had made it possible and given me the courage to acquire the enthusiasm and the energy to succeed as physics teacher in future schools.

All of this is intended to encourage each of us at this time of year to engage in a bit of reflection as to what led us into this noble profession. There is an invigorating mutuality in Highet's comments on the symbiosis between teaching and learning. Anna's song in Rogers and Hammerstein's famous musical, *The King and I*, put it this way: "It's a very ancient saying, / But a true and honest thought / That if you become a teacher, / By your pupils you'll be taught." The song's title, "Getting to Know You," speaks to the importance of the reciprocal and trusting relationship we have with students

as we both teach and learn from one another.

For some, opening closed gates leads our youngsters down fairly certain paths, already paced, well-established and predictable, safe and familiar. And that's fine and often useful. But there are other gates which give a more broadly-expanded 3-dimensional view, earth to sky, where paths must be freshly formed and there is no predetermined option. The delight and the challenge, in forming new paths with enthusiasm from previous experiences will be necessary to identify and solve our most perplexing problems today.

Here are several examples of how young folks and educators are taking the lead in opening the gates for mitigating climate-induced crises. *The Christian Science Monitor* has launched a series of 7 issues<sup>2</sup> examining the roles of what it defines as the Climate Generation (those born after 1988) taking the initiative to identify and help solve a variety of environmental problems which have morphed into crisis-mode. The reporters, Sara Llana and Stephanie Hanes, cover the actions and perspectives of Climate Generation students and entrepreneurs from Bangladesh, Barbados, Canada (above the Arctic Circle), Germany, Namibia, Portugal, Turkey, and the U.S. There is what is identified as a paradox between the increased global awareness of children's rights [1989 UN Commission on Rights of the Child plus climate change revisions in August 2023] and the climate shifts which adversely affect them. This Climate Generation has inherited the inadvertent dilemmas created by preceding generations, even more traumatic for them than the stresses and inequities produced by the older Industrial Revolution.

It is easy to understand the well-publicized sense of their frustration, their anger, even their perceived sense of despair. And yet, the reporters discovered "positive connections...[and] a sense of a solutions focus... [as they take] first steps of living amid global warming." There is the sense of a certain "eco-anxiety" in the mental health of many of the Climate Generation, yet, as a Namibian activist put it, "I just want that everybody has equal resources to survive the climate crisis. Everyone should have the tools to survive." We hear much about the negative aspects of instant communication platforms upon young people. However, very little of what is going on with climate response is done in isolation, especially during pandemic shut-downs. A farmer practicing regenerative farming in Portugal is in touch with an activist in Turkey. Data are available [Global Carbon Budget (2022)] to compare things like the average per person carbon footprint and contributors of carbon pollutants for wealthy vs. poorer nations.

In Barbados, student innovators are working with college scientists to convert a recent super abundance of Sargassum seaweed washed up on their shores into low-carbon-content biofuel. Renewable energy sources like wind and solar are being encouraged in the West African nation of Namibia. The NGO, Namibian Youth on Renewable Energy, NYRE, works to make this a reality. Many activists attended the COP28 conference in Dubai in November.

Resilience and persistence are strong among those living on the world's largest delta in Bangladesh. Rainwater is collected there since storms have increased the salinity of river water supplies; children's wellbeing affects both the cultural and practical family ties and functioning among communities there.

In Montana, as in similar legal ventures in Germany and Colombia, despite charges by the state that the lawsuit was "political theater," a judge ruled in favor of youth (22 and younger) who had sued the state for violation of the state's constitutional rights for a clean environment and a stable climate. An attorney for plaintiffs pointed out that, though bluster and compromise might dominate other circles, "in the court of law, facts matter." Something science teachers can understand!

In Portugal, as in several other drought-prone areas of Europe, there is something of a return to small-scale farming, enough to lure a Portuguese couple from Toronto to return to farming life in Portugal to put into practice the ideas in "permaculture," re-integrating humans into natural landscapes. As one model homestead founder put it, "instead of being exploited and exploiting nature, we can live differently." The success of local farm markets bears this out.

In polar Nunavut, east and north of Canada's Northwest Territories, an entire people's way of life is threatened by melting sea ice. The youth Guardians are defenders of the Inuit way of life because everything from houses (igloos) to food supplies are dependent upon a stable and cold climate. The unique Inuit-governed territory, an area the size of Maine, was created in 1999. As an Oberlin College professor, David Orr, pointed out, we tend to do our work in silos [Educators, too!], "by departments and divisions. But that's not how the Earth works." His remark reminds us of the BSCS green (ecology) version in the revised 1960's "alphabet science curricula," at a time when ecology was an optional unit, usually done at the end of the school year.

Here are some final observations from our VAST 2023 PDI: *Science Teachers Leading from the Classroom*:

When we lead from the classroom, like the global efforts to deal with climate crises, it is a story of individuals taking personal interest, initiative, resourcefulness, and responsibility. We lead and care for one another as individuals, not as abstract agencies. The Sterling Institute focused on problem-based learning and many workshops emphasized phenomenon-based instruction. Collaboration abounded throughout, both in executing the PDI, and inspiring attendees to do likewise back home. The term "experience" was used a lot in session titles; 18 stressed active learners, interactive dialogue, and engagement; 16 focused on connections outside science; 10 focused on climate and environment; 6 focused on accessibility issues (ELL and physically disabled). We learned and taught about ecosystems, innovations, phenomena, and teamwork skills. **Science teaching is an art.**

We are teachers in the process of determining and celebrating the day we find out why we were born, as Mark Twain's oft-cited remark would have it. In finding this out for ourselves, are we not (as teacher and learner) encouraging our young folks to find out, too? Which kind of gate do we want to open, down familiar streets, or open to new vistas where our tiny contributions actually may have global impacts – for the benefit of ALL of us on this good Earth.

A New Happier Year to you all!

George

A VAST Life Member, George Dewey is a former VAST President, former NSTA District VIII Director, Presidential Awardee, and Albert Einstein Distinguished Educator. He taught physics in Fairfax County, NBCT since 1999. He can be reached at: [gtdewey3@outlook.com](mailto:gtdewey3@outlook.com)

## References:

1. Highet, Gilbert. 1950 (reissue 1989). *The Art of Teaching*. New York, NY. Vintage Books.
2. Hanes, Stephanie and Sara Llana. "The Climate Generation." *The Christian Science Monitor*. Vol. 115, Issues 51, 52. 6, 13, November 2023. Vol. 116, Issues 1-5. 20, 27 November 2023; 4, 11, 18 December 2023.

# Let the field trip fun begin!

There's no way you could fit more discovery, engagement and excitement into one field trip!  
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Please consult the website for up to date information, VAST forms for awards and mini-grants, advertising and current PDI information. [www.vast.org](http://www.vast.org)

### Mission of the Virginia Association of Science Teachers (VAST)



- inspire students,
- provide professional learning opportunities,
- build partnerships,
- advocate for excellence at the school, local, state and national level.

Please send articles,  
letters to the editor, or labs by the submission deadline, March 1, 2024,  
for inclusion in the next Newsletter.

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