Excellence in Teaching Portfolio

Submitted for the Excellence in Teaching Award, Center for Teaching and Learning 2022

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Letter of Nomination

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The Center for Teaching and Learning, The University of Georgia
Excellence in Teaching Awards, 2022

Dear Selection Committee,

On behalf of the Department of Math, Science, and Social Studies Education, it is our pleasure to nominate Mx. Stephanie Eldridge for the Excellence in Teaching Award. Stephanie began their doctoral program in the fall of 2018 and immediately began working with preservice science education students. For the last three and a half years, Stephanie has diligently worked to improve the learning experiences that future science teachers experience at UGA by continually enriching and improving the instruction that takes place in our department across a variety of courses. We have chosen to co-construct this letter of support for Stephanie to highlight the breadth of support that they have provided to multiple faculty members, new doctoral students, preservice science teachers, and our teaching partners in the field through their work in several courses (ESCI 4450, ESCI 4460, ESCI 5460, ESCI 3450, ESCI 6420, ESCI 7080E), and as an active member of our student community.

A primary goal of the science education department is to train future science teachers. Our program includes a one-year block of instruction (multiple courses) in which students with a science degree are trained to become science teachers. This block of instruction focuses on immersing students in schools while learning strategies for teaching adolescents science. In 2018, Stephanie began working as a teaching assistant in this block of instruction, and their impact was felt immediately as Stephanie began interacting with students and faculty across the courses. Stephanie identified problems in the block instruction, such as a lack of attention to issues related to diversity, equity, and inclusion (DEI), as well as instances in which faculty were addressing the same topics in different classes. Stephanie's feedback led us to rethink how we plan the block of instruction. We now use a shared spreadsheet in which we provide detailed information regarding our planned instruction for each class. In addition, Stephanie has developed specific DEI learning experiences that have been implemented in a variety of the block courses.

Throughout 2018-2020, Stephanie continued to engage faculty in the revision of block courses, which contributed to Stephanie's expanded knowledge of the learning and teaching of preservice science teachers. In February of 2020, at the start of the COVID pandemic, Stephanie's relationship with preservice science teachers and their cooperating teachers was essential in their success in the spring. As preservice teachers were working in classrooms and moved to the online formal, Stephanie went above and beyond their teaching assistantship. Stephanie met with the preservice teachers weekly, guided them in completing the materials for licensure, and consistently 'checked in' with the teachers. In fact, Stephanie developed virtual modules for the preservice teachers to modify, learned about and shared innovative technology that made the teaching of science manageable for our preservice teachers. Many of the cooperating teachers commented about the support Stephanie provided to UGA students. They also noted that Stephanie's ability to conceptualize sound science instruction was essential in their navigation of the online environment. Stephanie's ethic of care and deep commitment to the UGA students and their cooperating teachers was exemplary during this time. At the end of the semester, all our preservice teachers completed their program. Stephanie was the primary reason we were able to do so.

In the summer, Stephanie joined a team that created an online course for secondary science teachers. It was during this time that Stephanie's exceptional ability to work in the online environment became evident. In our early meetings, modules were designed and planned to use the best practices of on-line instruction. Over ten modules were planned, with each module taking approximately 10-15 hours to build out. Stephanie stepped up and guided the construction of a majority of the modules to ensure there was consistency between them. As the modules were released to the students in the class, Stephanie carefully monitored the progress of the students and made notes about how to improve the modules the next time around. The attention to detail, the commitment to sound instruction, and their ongoing communication with students surpassed our prior experiences with teaching assistants. As a testament to Stephanie's work, the class evaluations revealed how vital Stephanie was to the learning of the students.

An important outcome of this summer course was also a scholarly presentation related to the design and enactment of online science education courses. In collecting data on the students, Stephanie identified important areas that are overlooked in online instruction, most notably, the need for teachers to consider how they address DEI issues online. This paper marks Stephanie's entrance into the scholarship of teaching and learning (SOTL), which is Stephanie's passion.

In the fall of 2020, we were tasked with moving instruction to a hi-flex model. Due to the nature of what we teach, this is complex because students' need to work collaboratively to build their understanding of sound science education. As students work together, faculty and Teaching Assistants consistently monitor 'what' and 'how' students know. In a hi-flex model, this is daunting for the most talented of teaching. Stephanie, however, reconceptualized the hi-flex environment to cultivate productive conversations. This was done by having face to face (masked interactions) in class and private conversations online. In addition, all of the class materials were stored and annotated in a way that the students could review the materials If a

student was still having problems, Stephanie met the student after hours to resolve the issue. Stephanie's creativity, attention to detail, and responsiveness toward students in this environment has led to a preponderance of positive feedback in which students expressed their satisfaction with the course instruction and attention to their success. This is a tremendous accomplishment in a hi-flex learning environment.

In closing, Stephanie has developed a reputation in our community for knowing about sound science instruction, caring deeply for students, and providing endless support. In our years of working with Teaching Assistants, Stephanie is certainly in the top 1%. Stephanie is exactly who this award seeks to acknowledge and notice as having excellence in teaching. In our experience, Stephanie is a solid choice for this award.

Regards,

Georgia Wood Hodges
Associate Research Scientist

David F. Jackson
Associate Professor

Julie A. Luft
Distinguished Research Professor

Personal Statement

My name is Stephanie Eldridge, and I am writing to apply for the Excellence in Teaching Award through the Graduate School at the University of Georgia. I am a fourth-year science education graduate student in the MFECOE's Department of Mathematics, Science, and Social Studies. My contributions to teaching beyond classroom responsibilities have involved collaborations with faculty and graduate students both within and outside of my department.

I came to UGA with the goal of becoming a science teacher educator and was offered the wonderful opportunity to work with four cohorts of pre-service science teachers (PSTs) over the past three and a half years. I have enjoyed taking every opportunity to TA courses with the science education faculty, teaching during every fall and spring and two summer semesters. My goal as a TA or IoR in each of these courses was to actively elicit student feedback and allow it to inform my instructional modifications. This occasionally meant working outside of the official TA hours, but the payoff was that our PSTs felt supported, heard, and comfortable voicing their needs. Our PSTs' Block 1 includes methods, curriculum, and practicum courses, which usually means multiple TAs are hired across the courses. I have enjoyed acting as a, informal peer mentor to TAs that are new to Block 1 each semester.

A core focus of my teaching lies in raising awareness of justice, equity, diversity, and inclusion (JEDI), so I completed the Certificate in Diversity and Inclusion through the College of Education's DEI office this fall (2021). I hope to support my colleagues in learning and growing our beloved community and have co-facilitated Trans Affirming Practices and Safe Space trainings for faculty, graduate students, and PSTs. My graduate student and faculty colleagues both at UGA and other institutions recognize my commitment to JEDI and have invited me as a guest instructor for elementary teacher education classes, DEI conference panels, and secondary teacher education classes at another institution (The Citadel, SC).

In 2021, as president of the Science Education Graduate Association (SEGA), I noticed many fellow SEGA graduate students commenting that they wished our seminar course (ESCI 8990) would incorporate practical skills that we would need throughout and beyond our graduate careers. I created a survey to gauge students' needs and interests (ex: constructing a curriculum vitae, publishing strategies, writing tips, developing a research agenda, mapping a path from comprehensive exams to dissertation, etc.) and worked with college of education faculty members and graduate student peers to create a revamped ESCI 8990 curriculum. The course was well-received and will be offered again this spring.

I have also volunteered some time to work with UGA's EcoReach environmental science outreach group. I helped create and modify science teaching resources for elementary teachers and design curricula for informal science teaching opportunities. I plan to continue to volunteer my time and expertise as a science educator toward a wide range of purposes, from local collaborations with K-12 teachers to professional learning opportunities for university students and faculty for the rest of my career. I appreciate your consideration of my application for the Excellence in Teaching Award.

Teaching Philosophy Statement

I believe four key elements are conducive to promoting enthusiasm for learning and allowing students to grow and mature intellectually, socially, physically, and emotionally. These are: the teacher as a facilitator rather than a reservoir of knowledge, holding a growth mindset paired with high expectations, fostering appreciation for diversity in the classroom, and providing a safe environment that fosters belonging.

Student-centered learning promotes student agency and shifts power dynamics away from teacher as gatekeeper of knowledge. A science teacher's job is to provide authentic opportunities for students to generate and investigate scientific questions. Relationship building with students allows teachers to identify opportunities to tap into students' interests to bring relevance to their experiences doing science. Students should be encouraged to take risks and be unafraid of failure, because learning through mistakes is as important as learning through success. By placing value on the *process* of science over the *product* and offering frequent opportunities for both peer and teacher feedback, teachers simultaneously foster a growth mindset in students and teach about the nature of science (NOS). A growth mindset is one that attributes learning to effort rather than inherent talent or ability. Fostering a growth mindset is an effective strategy to combat stereotype threat in marginalized students. Pairing a growth mindset with NOS sends a message to students that scientific skills can be learned and anyone can become a scientist.

Throughout their lives, students will encounter people of diverse races, ethnicities, first languages, gender identities and expressions, sexualities, religions, socio-economic statuses, ages, and dis/abilities. Working within diverse groups promotes understanding, respect, and appreciation for differing worldviews. This respect for diversity is essential for students' positive socio-emotional growth. An outstanding teacher is one who makes an effort to connect with students' cultural funds of knowledge to demonstrate that different ways of knowing are valuable and can inform scientific practice. This also facilitates cross cultural appreciation between peers for each students' unique perspectives. By connecting science instruction to students' lived experiences, and welcoming diverse perspectives, teachers can support students' sense of belonging in science – both as students and as budding scientists.

Most importantly, beyond the science curriculum, outstanding teaching involves building relationships that emphasize trust, mutual respect, and compassion with students. Providing a nurturing, supportive, and safe environment encourages students to focus on learning, and gives them the opportunity to flourish. Delpit describes a *warm demander* as one who pushes students to achieve greatness while providing the necessary socio-emotional support for them to be successful. The key lies in maintaining high expectations while building caring relationships with one's students. It is my firm belief that every student can succeed when held to equally high expectations and surrounded by a safe, nurturing, positive environment.

Academic Diversity Statement

I am committed to providing an affirming environment where all of my students can bring their whole selves safely to the classroom, to be seen, heard, and appreciated. As someone with multiple "invisible" identities – genderqueer, lesbian, neurodivergent, struggling with mental health barriers, I have felt the impacts of invisibility and silence on my own sense of belonging in various settings. In my K-12 experience as a student, I never felt welcome to bring my LGBTQ+ identity into any assignments and my impression was that it would be deemed inappropriate to do so. My first exposure to a queer scientist came between my first and second years of college. It was not until my final undergraduate year when I was finally invited to bring my whole self to a class conversation, both in discussing mental health and LGBTQ+ issues.

My research into issues of gender equity in science, technology, engineering, and mathematics (STEM) has also highlighted intersectional inequities. Underrepresentation of queer scientists of color, women of color, and people with disabilities in STEM brings into question how science educators can either reproduce or dismantle the marginalizing culture of science in their classrooms. In listening to and reading about others' experiences and considering my own, I resolve to have open and vulnerable conversations with my pre-service teachers where we explore our positionalities and interrogate implicit assumptions together. Teachers need to be aware of dominant norms and implicit assumptions they have about the ways that students "should" learn, behave, and communicate before they can be challenged. My research involves prompting teachers to recognize structural norms around gender and consider how language can be used to combat gender-based stereotypes in a science classroom context.

Pre-service teachers are the future of our educational system, and they have the power to expand their students' worldviews. However, teaching is not a one-way relationship; it is a conversation where teacher and students co-create knowledge and learn from each other reciprocally. I aspire to help PSTs recognize and embrace when their students bring cultural funds of knowledge to the science classroom. Viewing students as rich cultural resources opens the door for discussions about socio-scientific issues that impact their lives. Bringing cultural knowledge into the science classroom can also lead to engagement in citizen science projects which benefit students' local communities. It is important to me that teachers and students work together to create meaningful and contextualized learning.

Description of Courses Taught

Course: ESCI 5460: Science Education School-Based Internship
Role: Graduate Teaching Assistant
Semesters Taught: Spring 2022 (current), Spring 2021, Spring 2020, Spring 2019
Course Description: Student teachers complete a semester-long internship where they are placed full time in middle or high schools. Student teachers are responsible for taking on progressively increasing responsibilities culminating in their teaching (or co-teaching) all of their mentor teacher's classes. This is a professional internship and the only opportunity for a full-time authentic teaching experience before students graduate and seek employment.
My Contribution: Each student teacher must be observed a minimum of five times throughout the semester but may be observed more if needed or desired. I have observed and offered detailed feedback to numerous students throughout the past three years and will also be responsible for five students this semester. My role involves holding meetings with mentors and student teachers to set collaborative goals and address any concerns. I have also worked in teams with Dr. Hodges and mentor teachers to create professional development interventions with a couple of students who struggled to meet professionalism expectations.

Course: ESCI 3450: Practicum in Secondary Science Education
Roles: Instructor of Record (IR), Graduate Teaching Assistant (TA)
Semesters Taught: Fall 2021 (IR), Fall 2020 (IR), Fall 2019 (TA), Fall 2018 (TA)
Course Description: Pre-service science teachers (PSTs) get their first experiences working with mentor teachers in both middle and high school science classrooms. PSTs spend the first half of the semester in one setting, then switch to the alternative setting, allowing them to identify their preferences between middle and high school prior to their student teaching placements. Supervisors conduct two major observations throughout the semester, communicating with mentor teachers and PSTs to ensure PSTs are making progress towards the Intern Keys Evaluation System (IKES) performance standards. PSTs are responsible for submitting lesson plans ahead of time, conducting themselves professionally, and completing a task list of professional responsibilities.
My Contribution: As instructor of record, I communicated with all the mentor teachers, checking in biweekly to make sure their mentees were meeting expectations of professionalism, content knowledge, and pedagogical strategies. I set up eLC as a resource for practicum students to organize and submit important documentation and self-monitor their learning using checklists and regular announcements. I worked with TAs to develop an observation schedule to include detailed feedback and observation notes linked to students' IKES progress.

Course: EMAT 4460: Methods of Science Teaching
Role: Graduate Teaching Assistant
Semesters Taught: Fall 2021, Fall 2020, Fall 2019, Fall 2018

Course Description: Students are pre-service science teachers typically in their last year of either their undergraduate or a Double Dawgs master's program. This course is taken concurrent with ESCI 4450 and practicum as a part of students' Block 1. The course provides science instructional strategies and classroom assessment for grades 6 through 12. The purpose of the methods course is to demonstrate the "how" of teaching science, including planning for responsive science instruction, implementing science lessons, and using questioning strategies to formatively assess student learning. Over the past four years, there has been an increasingly prominent DEI component.
My Contribution: I have been a contact point for PSTs when they had questions or needed clarification on assignments. I participated in Block 1 collaborative planning sessions, co-constructed lesson materials, led the planning and implementation of a few lessons each semester, provided formative feedback on students' assignments, and prepared the classroom for activities/labs regularly. During my office hours, I provided feedback on lesson plans, talked through instructional strategies with students, and guided students' writing as they constructed their teaching rationales. I was responsible for creating and facilitating a gender equity and LGBTQ+ focused lesson each year, and I worked to embed equity conversations throughout the lessons I helped to plan.

Course: ESCI 4450: Science Curriculum
Role: Graduate Teaching Assistant
Semesters Taught: Fall 2021, Fall 2020, Fall 2019, Fall 2018
Course Description: Students are pre-service science teachers typically in their last year of either their undergraduate or a Double Dawgs master's program. This course is taken concurrent with ESCI 4460 and practicum as a part of students' Block 1. The focus of the curriculum course is to help pre-service teachers evaluate curricular materials and develop coherent unit plans. Students use strategies from the methods course in their lesson planning, but the foci are on connected instruction and appropriate summative assessments.
My Contribution: I collaboratively worked with TAs and Block 1 instructors (Dr. David Jackson and Dr. Georgia Hodges) to design lessons for the science curriculum course. I co-constructed lesson materials and rubrics, led the planning and implementation of a few lessons each semester, and provided feedback on students' curriculum units and individual lesson plans. I held regular office hours and responded promptly to regular e-mails from students.

Course: ESCI 7080e: Curriculum Planning in Science Education
Role: Graduate Teaching Assistant
Semesters Taught: Summer 2021
Course Description: A masters' level asynchronous online course created to support 48 pre-service and in-service science teachers' curricular planning in science education. The course offers task and module choice and follows the 5E format as a means of engaging students in an online environment. Students complete 8 different modules that align with the NGSS science and engineering practices (SEPs). Six additional modules were offered, with students required to

complete the four that most piqued their interest. Three of the optional modules focused on themes of diversity, equity, and inclusion.
My Contribution: I led a team of TAs and IoRs (Dr. Julie Luft and Dr. Georgia Hodges) in co-constructing and co-teaching an asynchronous online course for in service and pre-service teachers. I took the primary role of organizing the modules, creating and embedding formative assessments throughout each module, setting up the gradebook and all assignments, monitoring students' progress through the modules, and grading a portion of the final products. I was the primary contact for most students' urgent questions throughout the summer course. I was solely responsible for creating one module on cultural awareness and a second module on gender equity.

Course: ESCI 6200E: Science, Technology, and Society
Role: Graduate Teaching Assistant
Semesters Taught: Summer 2020
Course Description: 28 pre-service and in-service science teachers enrolled in this online asynchronous course. The official name of this course is Science, Technology, and Society (STS), although in order to reflect current trends in science education we use the term socio-scientific issues (SSI). The idea behind SSI is that students are in a better position to learn science when science is situated in complex, real world problems. In addition to learning the science content associated with such problems, SSI also foster learning about the nature and character of scientific knowledge as well as how science intersects with other disciplines.
My Contribution: I worked with Dr. Julie Kittleson to plan four asynchronous modules, each with a set of readings, resources, tasks, and reflections/response papers. I helped monitor student progress through the modules and evaluate the quality of student submissions.

Course: 4420: Science in Early Childhood
Role: Graduate Teaching Intern
Semesters Taught: Spring 2020
Course Description: An elementary science education course taught by Dr. Deborah Tippins. All students were pre-service elementary (K-5) teachers who would be responsible for incorporating science into their curricula. This course was taught face-to-face until the mandatory transition to remote learning in March due to the COVID-19 pandemic.
My Contribution: Because this was a teaching internship, my responsibilities were minimal. I gathered and prepared materials for labs and activities and co-facilitated activities that were planned by Dr. Tippins. When we transitioned to online learning, I helped keep track of assignments, graded some submissions, and created a celebratory video of our time together to share with the class at the end of the semester.

Sample of Teaching Materials

Practicum in Science Teaching

Student teaching and Practicum can be a bit overwhelming for new pre-service teachers, with a fair bit of paperwork to keep track of on top of regular assignments and lesson planning. To help my PSTs self-monitor their progress, I created a practicum checklist with everything they would need for the semester on a single page. (Right) I added a Flipgrid component to the practicum course because PSTs in the past have commented that having a space to share teaching experiences and discuss dilemmas with peers was a meaningful learning experience.

Practicum Assignments Checklist

Below is a list of the assignments you will be completing this semester. The purpose of this list is to help you keep on top of your practicum duties because you may not all be completing your teaching assignments at the same time.

Weekly:

- ❑ Log practicum hours in your **PRACTICUM LOG FALL 2021** document and share the document with your mentor teacher.
- ❑ Flipgrid reflection post (by Sunday) and **two** peer responses (by Wednesday).

	Wk 1 9/12	Wk 2 9/19	Wk3 9/26	Wk 4 10/3	Wk 5 10/10	Wk 6 10/17	Wk 7 10/24	Wk 8 10/31	Wk 9 11/7	Wk 10 11/14	Wk 11 11/21	Wk 12 12/5	Final 12/8
Reflection													
	9/15	9/22	9/29	10/6	10/13	10/20	10/27	11/3	11/10	11/17	11/24	12/8	
Peer Response													

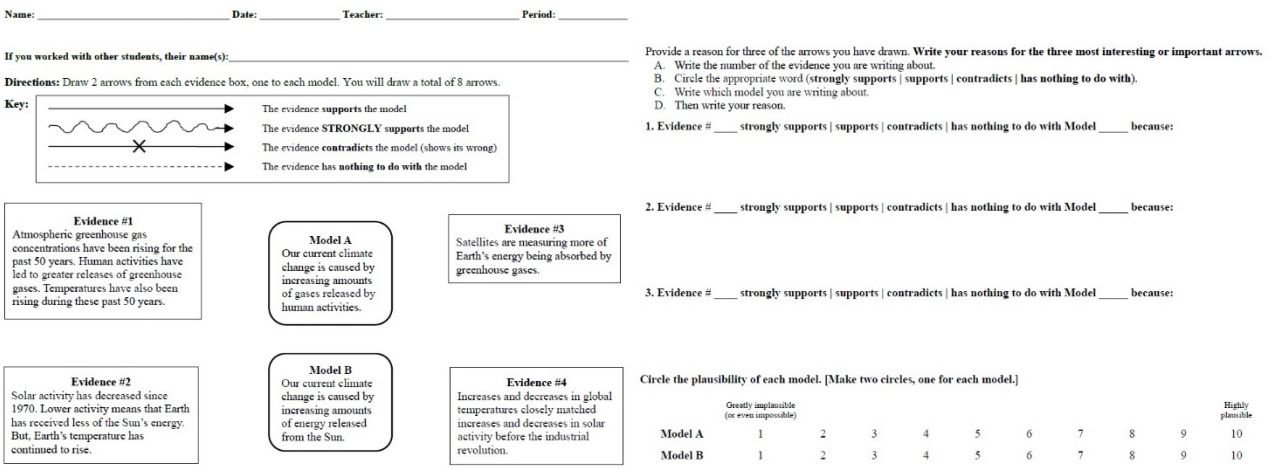
- ❑ Write in your journal.
- ❑ Check eLC weekly for reading/written assignments. You will not have an assignment every week, but you may have a few scattered throughout the semester. These may include cases for you to read and respond to, or a set of reading response questions to guide you through an article. You will receive an e-mail from me when a reading assignment has been posted. All eLC assignments will be posted at least five days before they are due.

Individual Assignments:

- ❑ Track activities using the **Practicum Choice Board**. Have your mentor teacher sign off on it at the end of your practicum rotation. Use one choice board per rotation.
- ❑ During your first rotation, plan and teach a lesson 2-3 class periods in a row (2 if the school is on block schedule; 3 if classes are ~45 minutes each).
- ❑ During your second rotation, plan and teach three consecutive lessons to the same class period, 2-3 days in a row (2 if the school is on block schedule; 3 if classes are ~45 minutes each).
- ❑ Keep **a professional journal** of your experiences, observations, resources, and reflections. This will be turned in to me at the end of the semester. The format of the journal may be **either physical or digital**. If you turn in a physical journal, you will be receiving it back before you begin your student teaching internship in the spring. I will be looking for indications of thoughtful reflection, creative ideas, and insightful observations in these journals. Ideally, you will use your journal as a reference to help you create thoughtful, reflective Flipgrid posts. Your journal notes should help you justify any claims you make in response to the Flipgrid prompts.

Teaching Argumentation

In the science teaching methods course, I helped plan a lesson to foster scientific argumentation skills, using a Model-Evidence-Link (MEL) framework (obtained from the SERC project at Carleton College). The lesson also provides opportunities to engage in the Claim-Evidence-Reasoning (CER) process for constructing explanations. To complete the MEL, students read a packet of articles about the topic, then draw lines indicating the strength of support of each piece of evidence for the claim being made. Students then argue for the claim that best suits the evidence.



Name: _____ **Date:** _____ **Teacher:** _____ **Period:** _____

If you worked with other students, their name(s): _____

Directions: Draw 2 arrows from each evidence box, one to each model. You will draw a total of 8 arrows.

Key:

- The evidence **supports** the model
- The evidence **STRONGLY supports** the model
- The evidence **contradicts** the model (shows its wrong)
- The evidence has **nothing to do with** the model

Evidence #1
Atmospheric greenhouse gas concentrations have been rising for the past 50 years. Human activities have led to greater releases of greenhouse gases. Temperatures have also been rising during these past 50 years.

Evidence #2
Solar activity has decreased since 1970. Lower activity means that Earth has received less of the Sun's energy. But, Earth's temperature has continued to rise.

Model A
Our current climate change is caused by increasing amounts of gases released by human activities.

Model B
Our current climate change is caused by increasing amounts of energy released from the Sun.

Evidence #3
Satellites are measuring more of Earth's energy being absorbed by greenhouse gases.

Evidence #4
Increases and decreases in global temperatures closely matched increases and decreases in solar activity before the industrial revolution.

Provide a reason for three of the arrows you have drawn. **Write your reasons for the three most interesting or important arrows.**

A. Write the number of the evidence you are writing about.
B. Circle the appropriate word (**strongly supports | supports | contradicts | has nothing to do with**).
C. Write which model you are writing about.
D. Then write your reason.

1. Evidence # ____ strongly supports | supports | contradicts | has nothing to do with Model _____ because:

2. Evidence # ____ strongly supports | supports | contradicts | has nothing to do with Model _____ because:

3. Evidence # ____ strongly supports | supports | contradicts | has nothing to do with Model _____ because:

Circle the plausibility of each model. [Make two circles, one for each model.]

	Greatly implausible (or even impossible)									Highly plausible
Model A	1	2	3	4	5	6	7	8	9	10
Model B	1	2	3	4	5	6	7	8	9	10

Supporting Science Literacy

My colleagues and I co-created a lesson on socio-scientific issues (SSIs) that began with the incredibly relevant science behind vaccine development. Whenever I plan a lesson, I always create an activity timeline and begin the class by sharing the timeline with my students. This way, they can anticipate what to expect and can self-monitor the time they are taking on each activity. An example of a daily schedule for the SSI lesson is shown to the right.

Daily Schedule:

1). 8:30-9:10. The discovery of vaccines, pp.277-280. Complete the Part I Activity on pages 281-282. Viral group rankings discussion (35-40 min)

2). 9:10-9:35. Apply and analyze simulation activity, discussion (20-25 min)

3). 9:35-9:50. Vaccine design challenge-read, work on graphic organizer (15 min).

4). 9:50-10:00. BREAK

5) 10:00-10:15 Should vaccines be mandated for all low risk people (non-immunocompromised)?

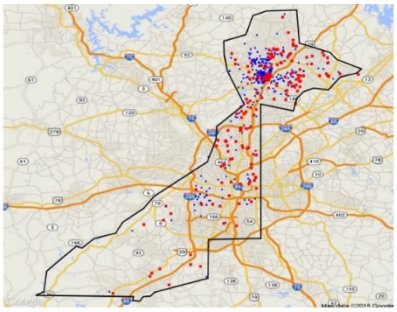
5). 10:15- 10:30. What is an SSI discussion (.ppt).

6). 10:30 - 11:10. SSI examples: Identify and begin to investigate an SSI to create a product. (Share in last ten minutes if time permits.)

PSTs investigate the difference between 80% and 95% vaccination coverage through a measles simulation for Fulton County, GA. Following the simulation, PSTs work collaboratively to identify a virus of interest and create a vaccination research plan. This prompted some passionate debate surrounding vaccine mandates and required immunizations for schools.

This is a simulation of a measles outbreak assuming vaccination coverage of 80% school-age children. If more than a few cases appear, herd immunity has been lost.

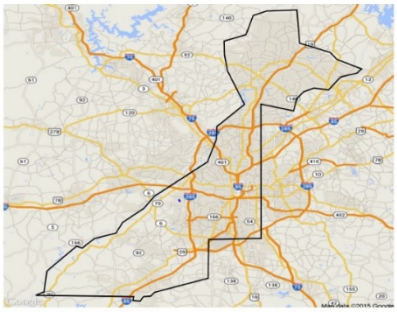
Measles in Fulton County, GA
Coverage = 80%
Day 104



Red Dot = Infectious Case Blue Dot = Recovered Case

This is a simulation of a measles outbreak assuming vaccination coverage of 95% of school-age children. If very few cases appear, herd immunity is intact.

Measles in Fulton County, GA
Coverage = 95%
Day 104



Red Dot = Infectious Case Blue Dot = Recovered Case

Part of what makes SSIs so compelling is their controversial nature and connection to social issues. Throughout both methods and curriculum courses, I encourage my PSTs to situate their teaching within its social context. This involves knowing your students, their communities, and the issues that are most important to them and helping connect these issues to relevant scientific phenomena. SSIs are the perfect means to make these connections. We discuss GMOs, fracking, oil consumption, invasive species, and other SSIs, then PSTs follow a series of prompts to brainstorm their own SSI lesson. Engaging students using SSIs is a great way to foster scientific literacy because students evaluate the reliability and potential biases in their resources. For example, we asked students to reflect on resources from the CDC, WHO, local public health departments, and social media sources. I encouraged PSTs to find and share global resources outside of those provided by the WHO and to expand their perspectives beyond an SSI's impact on the continental United States.

Your turn!—Socio-scientific Issues Identification

Choose an SSI that you would like to use for your Enhanced Topic three-day lesson. You do not need to choose something listed on eLC, but you're welcome to.

Answer the following questions on your slide:

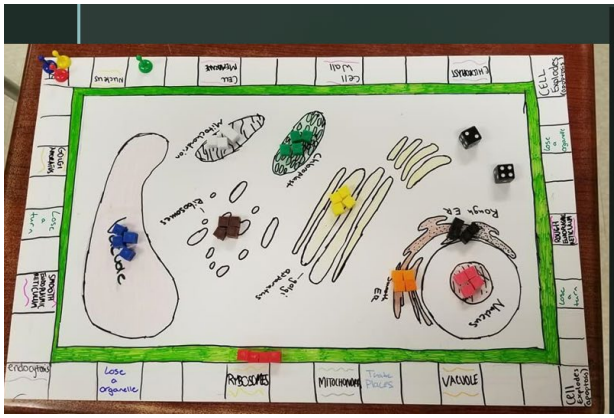
- What is your SSI?
- What are the arguments for or against it?
- Describe the scientific principles at play in this issue. How is the science used to support either argument?
- How do you plan to use this in your enhanced topic lesson? How does this tie into your lesson's target DCIs?
- Cite your sources for information or resources.

Innovation in Teaching

During my first semester as a TA for Science Methods and Curriculum, I introduced a Board Game Review Project that I used with my high school Biology students to model an innovative summative assessment. For this project, pre-service science teachers created tabletop games to model a chosen system. The guide I created to walk them through the game creation process challenged them to think deeply about how their game accurately models their system and what the limitations are. Teachers created their system model games and articulated a set of rules that mirrored the scientific processes of their system. PSTs then played each others' games to "learn" their system. Finally, peers evaluated each other on the strengths and areas of improvement of their game design in helping them learn the system. Examples below were provided from my secondary Biology students.

Goals of this project:

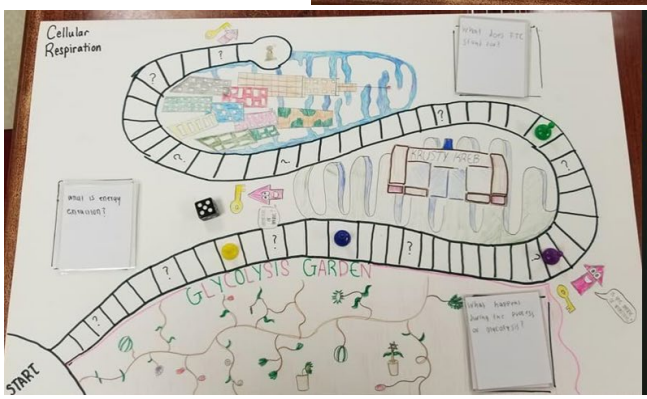
1) Your team will create a game that **imitates** or **models** the process you chose. The goal is *not* to create a trivia game, although answering knowledge-based questions during the game is appropriate. The goal is to create a game that takes players through the process (if applicable) or models the interactions experienced in a given scientific system.
2) Through developing a board game, identify patterns, cause and effect relationships, structure and function relationships, use of energy and matter, sense of scale, and stability and change in systems.
3) Create a game that is playable and will reinforce or teach key concepts to students not involved in the development process, or who are unfamiliar with the processes involved in your system.
4) Identify the targeted grade band as well as the Georgia Standard for Excellence that is addressed during gameplay.



Cellopoly: Cell Structure & Function

This is a straightforward organelle collecting game.
Goal: collect one of each organelle to build a functional plant cell.

Gameplay: You get an organelle by landing on that space **and correctly naming its function**. Take a cube from the organelle, and be the first to collect all nine, but beware, if you land on apoptosis, you'll lose all your organelles and have to start over. On the flipside, endocytosis gives you a free organelle of your choice.



Cellular Respiration Game:

Goal: Reach the end of the path to be the first to get ATP.

Gameplay: Answer questions about each stage as you move through Glycolysis Garden, the Krusty Kreb, and ETC Towers to reach the end. At each junction, in order to get the key to the next stage, you need to answer whether the process you just went through is **aerobic** or **anaerobic**.

In addition to incorporating game-based learning as a topic in pre-service secondary education courses, I have taught augmented reality game development using ARIS during a summer youth STEAM camp (2019, The Citadel). I have also planned and implemented lessons on

computational thinking that encourage PSTs to engage with coding in an approachable way (through NetLogo simulations).

Samples of Student Work

Teaching Computational Thinking Skills

To the right is an example of PST responses to a computational thinking guide that I created to help them think about biological system modeling through coding. Students chose a chunk of code from a NetLogo simulation that modeled a biological system, and they worked to identify the function of the code, linking it to the biological process being modeled. Teachers then extended this exercise to consider how they might use simulations to help students investigate biological systems in their own classrooms.

of code. Choose 6-10 lines and transcribe them in the table below (remove rows as needed).

Line #	Code syntax (text, include spacing)
31	;; reports maximum moth population for a given environment
32	to-report upper-bound
33	report (10 * num-moths)
34	end
100	;; we have a range of 'well-camouflaged-ness', dependent on the rate of selection
101	to moths-get-eaten ;; moth procedure
102	if (random-float 1000.0 < ((selection * (abs (env-color - color))) + 200)) [die]

Q: What function does the section of code you selected serve? How does this code reflect the underlying scientific principles demonstrated by the simulation?

The lines 31-34 seems to limit the maximum number of moths possible for the entire population assuming they have unlimited resources. I thought this reflected the scientific principle of how populations act in real environments. Since this is a simulation and the population could have endless resources, it would be unrealistic if the population just continued to grow endlessly and never reach 0 despite natural selection occurring. The lines 100-102 seems to serve how often moths get eaten or the probability of the rate of selection. The part of the code reflects a factor of natural selection where a trait has a benefit and thus, is less likely to be selected for consumption.

Q: What are some benefits to using a simulation like this in a classroom as opposed to observing these principles in nature? What are some drawbacks?

Some benefits to using a simulation are that there is the option to speed up a process and see how natural selection occurs in a time lapse. This would not be possible to observe that easily for a class of students since changes in populations occur over long periods of time. Moreover, the simulation allows more control of variables such as the amount of pollution in the environment whereas in real life, that would have dire consequences on the real environment. Some drawbacks of this simulation may be that for some levels of students, it may be too complex as there are many variables students could play around with.

Addressing Gender Equity in STEM

In a module prompting pre-service teachers to identify norms surrounding gender expectations at their schools, PSTs posted their noticings to a jamboard (below). This opened the door to discussions about ways teachers either reproduce or dismantle gender norms through their curricular choices. The module culminated in students creating a lesson plan that included considerations for trans and gender nonconforming students or other marginalized groups in STEM like black and brown girls. In these lesson plans, PSTs highlighted the scientific achievements of women of color and queer scientists as well as modifying their language for both gender inclusivity and scientific accuracy.

Some student examples of considerations for gender inclusivity are (all pseudonyms):

"When talking about genetics and mutations that are specific to sex, students may have questions regarding how to take into account transgender people and other people of the LGBTQ+ community. One possible question a student could ask is "how would I follow an x linked disease in my family's pedigree if my brother is transgender?". Another question could be "how do I account for my transgender family member and still accurately present a pedigree?" – Iliana

"This could be a time to highlight genetic mutations that cause folx to be intersex or experience some genetic identity that is not just "XX" or "XY". It could also be relevant to talk about species that don't express X-Y chromosomes at all and have different combinations that exist in the biological world." - Erick

Evaluation of Teaching

Sample Student Evaluations

Thank-you Note Received Through the Center for Teaching and Learning:

Course: ESCI 7080E, Curriculum Planning in Science Education (Summer 2021)

Mx. Eldridge,

I really appreciate your feedback and interaction with your students in ESCI 7080 this summer. I appreciate all that you and the other professors and TAs have done to remodel this course, making it more engaging. I am reaching out to you, in particular, because you consistently communicate with students about the feedback we have given about the class. I have been on the receiving end of student feedback, and it can be difficult to respond to at times. You do a great job at communicating modifications in a way that is fair and makes students feel heard. I appreciate it!

Select Qualitative Feedback from Course Evaluations:

"Steph is really awesome and always takes great care to make sure their students get the feedback that we all deserve. Their course is organized to be progressive in the amount of work we have to do and the prep that goes into it."

"I enjoyed the format of this class. I enjoyed how at the beginning of the semester we were given a checklist and pacing guideline to keep us on track with the assignments of this course. The format of this course allowed for big assignments to be spread out from each other to allow us ample time to write well-thought-out lesson plans for each rotation."

"Steph is always very kind and puts the general safety and concern for public health above all else."

"Stephanie did a fantastic job of clearly listed their expectations for all of the students. It was like they had a sixth sense to tell what we were confused on and they would clarify without anyone needing to ask. Other than that, Stephanie was more than happy to assist any student with questions or concerns, I know Stephanie stood up for us any time we needed them too. In the classroom, Stephanie presented material in a way that was confident and simple to comprehend."

Select Quantitative Evaluative Feedback:
Quantitative evaluations were scored using a 5-point Likert scale with 5 representing strong agreement with each statement. Average scores are reported below.

Prompt	ESCI 3450
The course was effectively organized.	4.500
Assignments and activities were clearly related to course goals.	4.375
The instructor was knowledgeable and well-prepared.	4.875
Assignments and activities were useful for helping me learn.	4.375
New skills and/or concepts were presented in ways I could understand.	4.375
The instructor was open to students' questions and comments.	5.000
The instructor provided useful feedback on student work.	4.875
Course work was evaluated according to clear expectations.	4.500
The course challenged me to think and learn.	4.625

Feedback from Instructors:
"Stephanie has demonstrated what being an empirical-based practitioner is all about. Throughout the entire class, they drew upon empirical work to make decisions about the lesson format. In addition, they emphasized 'the ethic of caring' in working with students. Stephanie was concerned about the welfare of the students and consistently checked in on their well-being, as well as providing clear suggestions for them to improve their work." – Dr. Julie Luft

"Stephanie is a gifted teaching assistant who understands the importance of learning science, presenting science in a manner that ensures equity and inclusion of all students, and how to translate research into practical suggestions. It is these skills and abilities that will make they the next generation of teaching." – Dr. Julie Luft

Teaching-Related Training and Coursework

Education Courses Taken at UGA: ESCI 8200 – Science Supervision, EDUC 8190 – Social Justice Frameworks, EPSY 7610E – Nurturing the Independent Learner, ESCI 9730 – Science Teacher Education, ETAP 7330 – Equity in Education, ETAP 7310 – Critical Studies in Educational Theory and Practice, ETAP 7610 – Culturally Responsive Classroom Management
** I completed a waiver for GRSC 7770 because I previously taught Biology 101/101L as instructor of record at Trident Technical College before coming to UGA.*

Professional Activities Related to Teaching

INVITED TALKS

Fall 2021 – Invited Lecturer, University of Georgia
Topic: Using cases to discuss LGBTQ+ and other family structures while teaching inheritance.
Course: ESCI 4420 Science for Elementary Education

Spring 2021 – Panelist, University of Georgia
Topic: Feminisms and feminist teaching in undergraduate teacher education classrooms: A conversation with feminist teacher educators.

Fall 2020 – Invited Lecturer, The Citadel, Charleston, SC
Topic: Trans affirming practices for secondary educators.
Course: Secondary Methods

Spring 2019 – Training Session Facilitator, University of Georgia
Topic: Developing trans affirming practices in education and the helping professions. This training session was open to faculty, staff, and graduate students.

Fall 2018 – Invited Lecturer, University of Georgia
Topics: Middle school science teaching: photosynthesis, protein synthesis, and genetic variation. I was invited on three separate occasions.
Course: ESCI 4470 Special Topics in Science Teaching

SELECT PRESENTATIONS

Leary, E., & **Eldridge, S**. (2022, January 5-8). *Using the 5Es to plan and implement an asynchronous online course in science education* [Poster presentation]. AERA 2022 International Conference, Greenville, SC, United States.

Sexton, C., & **Eldridge, S.** (2022, January 5-8). *Using cases to discuss LGBTQ+ families with preservice elementary science teachers* [Paper presentation]. AERA 2022 International Conference, Greenville, SC, United States.

AWARDS AND CERTIFICATIONS

2022 (Anticipated) Interdisciplinary Qualitative Studies Certificate, UGA
2021 Certificate of Diversity, Equity, and Inclusion, UGA
2020 Outstanding Teaching Assistant Award, University of Georgia Graduate School and Center for Teaching and Learning
2018 South Carolina State Board Certified Science Teacher (6-12)

RECENT COMMUNITY INVOLVEMENT IN EDUCATION

2020 – 2021 EcoReach Curriculum Committee volunteer, UGA,
2020 –2021 Science Education Graduate Association President, UGA
2020 – 2021 NARST Equity & Ethics Strand volunteer
2018 – 2020 Trans-Affirming Practices Committee member, UGA
2020 Subregional National Science Bowl competition coordinator, UGA

PROFESSIONAL EDUCATIONAL MEMBERSHIPS, CONFERENCES ATTENDED

The Association for Science Teacher Education (ASTE Conference, 2020 & 2022)
National Association for Research in Science Teaching (NARST Conference, 2019 & 2021)
National Science Teachers Association (NSTA Conference, 2016 & 2018)