Teaching Portfolio

Margot Popecki

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Department of Genetics

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Franklin College of Arts & Sciences
Division of Biological Sciences and Department of Genetics

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Dear Members of the Selection Committee:

We are pleased to provide Ms. Margot Popecki (PhD Candidate, Department of Genetics) with the highest endorsement for consideration for the Excellence in Teaching Award. Having both collaborated with Margot for over four years, we believe we can provide a strong account of her ongoing development as an innovative and impact-generating instructor and colleague. Our letter is co-written (K.R.M. and J.P.W.) to reflect different facets of Margot's efforts towards advancing excellence in teaching at the University of Georgia.

The Division of Biological Sciences (Division) has an ongoing collaboration with UGA's Writing Intensive Program (WIP) that several years ago, enabled a graduate student trained through the WIP to be assigned to the Division for a Teaching Assistantship with a main goal of re-imagining the research paper writing and submission process for students enrolled in undergraduate research for academic credit. Little did I (K.R.M.) think that Margot would become one of my most trusted and steadfast colleagues who not only help to develop writing guidelines for students but who also took the Division's commitment to providing scientific writing training for our science majors to a completely new level. In the time I have worked with Margot, she has collaborated with science and science writing faculty to develop research paper writing guidelines that are comprehensive in addressing both big picture and subtle aspects of scientific writing for peer-reviewed journals, and she developed extensive resources for students to use to better meet these guidelines. She has reviewed over 600 papers, closely following the guidelines of the WIP that espouse what it means to write, and review writing, in the disciplines. She has provided students with feedback on drafts of papers, often reading the same paper two or three times, before accepting a final version. These resources and guidelines are so outstanding that other academic programs on campus have asked for permission to use them for their own research writing process. Margot will graduate soon, but she is vested in this specialized assistantship continuing to help the BIOL degree program. To that end, she developed a guide to help future graduate teaching assistants in this position that includes advice on giving feedback to students in compressed periods of time and how to approach the reviewing process.

But she has done so much more for teaching scientific communication. She has given live online and in-person writing workshops every semester that breakdown the scientific writing process for students. She has built a repository of videos of these same lessons, and she has reviewed drafts of papers for students throughout the duration of semesters. She helped develop the Division's first set of Thesis writing guidelines. She has met with faculty who conduct Discipline Based Education Research (DBER) to understand how the writing process in their field differs from typical science writing, and she has made additional writing guidelines for students conducting DBER in Life Science departments. And, all of these efforts are just the ones that she completed within her role as a Teaching Assistant in BIOL. To help herself meet these goals, she engaged in professional development that allowed her to address issues related to equitable writing/grading practices, the goal of science communication, why we have scientific writing conventions and evaluating their nuances.

From the perspective of her mentor and former Graduate Coordinator for the Department of Genetics (J.P.W.), there are two remaining ways to look at how key Margot's efforts have been. Her preparatory materials developed over the last few years, as noted in the previous paragraph, actually made it quite difficult for another student funded by the same mechanism to find an additional niche in which to guide students in their technical writing! Margot's dedication to this instructional assignment has been clear for every semester in which she has participated, and the energy she puts towards ensuring her students receive clear guidance and fair, transparent evaluation is really valuable and shows how quickly Margot has become an instructional peer in biological education circles. Additionally, her diligence early in this program has allowed the continued support for her T.A. position, which is itself an outstanding boost for our graduate program in the Department of Genetics as the funds to support TA-ships are a key resource for ensuring continuity of support throughout the rigors of a Ph.D. in Genetics.

On top of all of this, Margot has been avidly involved in science outreach in Athens, often focused on the fireflies she is studying for her Ph.D. She has worked often with EcoReach at UGA game days and with local schools, and particularly notable is a field guide and coloring book she and a colleague developed that have been used not only for local outreach but also by Great Smoky Mountains National Park, the Xerces Society, and the Atlanta Firefly Project. She has been involved in creating firefly kits that are available at ACC libraries with materials and instruction for a craft related to firefly pigmentation, information on firefly-positive plantings, and items for observing fireflies. Her in-person outreach at the ACC library was accompanied by the UGA Insect Zoo and a presentation on fireflies – she is a phenomenal ambassador for teaching people how to conserve these beautiful insects!

Margot's instructional skills and innovative thinking have helped carve a niche at UGA that is highly unique. She has taken a massive undergraduate science program and has strengthened its core such that she is providing one of the very few writing-intensive experiences in upper-level science courses. The foundation she has built for improving scientific writing skills as UGA science majors progress through their degree programs is one that will far outlast her tenure as a graduate student. She has displayed clear excellence in her teaching and outreach with innovative thinking that makes her an exceptional candidate for the Excellence in Teaching Award.

Sincerely,

Kristen R. Miller

Dr. Kristen Miller
Director, Division of Biological Sciences

John Wares

Dr. John Wares
Professor, Dept. of Genetics

Personal Statement

My name is Margot Popecki, and I am a seventh-year PhD Candidate from the Department of Genetics. I have had the pleasure of teaching at the University of Georgia (UGA) for six years, supporting courses within my department and the Division of Biological Sciences. At the beginning of my teaching career, I joined the Writing Intensive Program (WIP) to assist Dr. Tessa Andrews with Honors Evolution. This was a formative experience for me, as Dr. Andrew is an excellent teacher, and I was grateful for the chance to work with her. I began to see my teaching assistantships as valuable opportunities to improve my teaching.

As I taught other courses, I began implement my own innovative strategies for active learning into the coursework. Inspired by the "Five Minute Teach" concept I learned during WIP orientation, I incorporated short writing workshops and activities whenever I could, typically during waiting periods or if the lesson finished early. These activities were designed to prompt critical thinking and reflection via writing, which is a powerful way to synthesize ideas, make connections, and clarify questions. For seven semesters, I have enthusiastically shared these supplementary activities with Dr. Lindsey Harding's graduate course WIP Pedagogy for Biology, in addition to offering my insight on writing instruction. To support other teaching assistants from my department, I initiated a slide share on eLC to provide examples and starting material.

My role extends to providing instruction on how succeed as a science major. In every class, I take time to encourage students to get involved with undergraduate research. Many students have asked for my help finding a research group and how to contact professors; I have even provided a template for writing inquiry emails to professors to alleviate any concerns about professional writing. It is important, particularly for first gen students, to increase awareness of the opportunities that will be beneficial when applying to future jobs or professional or graduate school.

Beyond the classroom, I have served the UGA community through science outreach. Volunteering with EcoReach, a student-led outreach group, has provided me with countless opportunities to engage with the local community, from a classroom visit at Lovin Elementary to discuss pollution in Georgia to making water cycle bracelets at the Winterville library. My participation with EcoReach equipped me with the teaching, communication, and confidence to lead my own outreach projects; for example, I collaborated with two other graduate students from my department to design "The Diversity Tree of Life" booth for STEMzone, an event that ties science outreach into a football game. We developed several activities to get people curious about the evolution occurring in their own backyard.

One of my favorite outreach experiences was inspired by fireflies, the subject of my doctoral research. In partnership with the Athens Area Public Library and librarian Elizabeth Hood, I established a virtual firefly monitoring outreach program. Our objective was for participants (children and teens, with their adults) to watch fireflies and report their observations in an online survey, which prompted the participant to identify the firefly species. To complement the survey, I created resources such as a field guide that described firefly diversity of Georgia, in addition educational pages on conservation, bioluminescence, and communication. The virtual activity was enriched by kits, which were designed for both age groups and provided for free. I earned $1,470 in grant funding to purchase supplies for the kits, which included coloring pages depicting scenes of firefly biology and behavior, equipment to view the fireflies such as magnifying classes and nets, a notebook, native seeds to create a firefly friendly yard, and crafting supplies to make a craft related to my research. To conclude the program, I gave an in-person talk "All About Fireflies," featuring the Insect Zoo from the Department of Entomology and certificates of completion.

I am honored to be nominated for the Excellence in Teaching Award. Putting together this portfolio reminded me of the incredible students and teaching experiences I have had at UGA

Teaching Philosophy

My interest in teaching was cemented after watching a video of bell hooks speaking about her experience teaching at Columbia University and a community college in New York City. While the students from both institutions were equally bright and capable, hooks noticed a difference in their attitudes: the Columbia students felt entitled to their education, whereas the community college students did not. This observation made me realize the transformative impact a teacher can have on their students. It is important to me that everyone, regardless of their background, can feel curious and excited about pursuing science. I realized that teaching could combine my passion for advocacy with evolutionary biology; as an instructor, I could share my knowledge while also empowering my students to achieve their goals. These two experiences have shaped my teaching philosophy, which centers joy, curiosity, and respect.

As an instructor, I strive to ensure my students feel supported and are seen as individuals. For learning to occur, students must feel at ease conveying uncertainty and receiving feedback. One way I show encouragement for my students is through communication; I provide space for questions and ask for their perspectives often. For example, while students worked on an activity during Biology Lab, I circulated the room and visited each group to discuss what they were doing, showing a genuine interest in their learning. It is important that students recognize their capability to find the solution, with input from myself and their peers. For example, a student once asked for help focusing their microscope. Instead of doing it myself, I guided the student through the process until they smiled at seeing a finely focused slide!

My goal is for students see themselves as learners and teachers; that their ideas and participation enrich the class to help others learn. To establish a positive learning community, I ensure students are treated fairly and held to an equally high standard. To maintain an environment where all students can feel comfortable participating, I model respect and professionalism for my students. While I cannot define a safe space for others, insensitive behavior and microaggressions are not tolerated in my classroom.

I want my students to feel like they benefit from attending class. Learning is built upon joy, which comes from meaningful and engaging experiences. As students have diverse learning needs, I incorporate multiple forms of delivery such as videos, brainstorming, discussion, group work, and reflective writing. In the future, I hope to include art and creative projects to inspire students to connect with the material in ways that fit their interests. One strategy I have taken is to give students choice in choosing their own topic regarding projects, as this encourages them to connect with the subject on a deeper level. To help students understand the relevancy of course material, I try to include real examples from scientific papers, news articles, and my own research on fireflies.

I am committed to improving my teaching skills. I take evaluations seriously and integrate student feedback into my approach moving forward. To broaden my perspective, I read books on teaching; my favorites include *Teaching to Transgress* by bell hooks, which emphasized the importance of mutual respect in the classroom, and *Science in the City* by Dr. Bryan A. Brown; this book, in addition to conversations with Dr. Deborah Tippins, guided me toward the principle of teaching to the student. Like many college students, I endured "weed-out" courses and a harsh "sink or swim" attitude. Now that I am a teacher, I choose empowerment: How can I meet the needs of my students to help them thrive? Like the professors who inspired me, I share my passion for science to uplift others.

Description of Courses Taught

Writing Intensive Program (WIP) indicates courses with a substantial writing component; WIP teaching assistants require additional training to provide discipline-specific writing instruction.

Title: Biology Research Courses (BIOL49X0R)
Role: ½ WIP Teaching Assistant
Enrollment: Approximately 120 students
Terms: Fall 2023, Spring 2023, Fall 2022, Spring 2022, Fall 2021, Spring 2021, Fall 2020
Course Description: During the semester, students perform and communicate scientific research under a faculty member in Biological Sciences.
Responsibilities: Review research papers of students enrolled in research courses in Biological Sciences. Each semester, students submit a 10-page required research paper that I provide feedback on. To support students in their writing process, I have developed content and resources (i.e., workshops, recordings, guides). This includes three optional virtual workshops, which provide guidance on writing, revising, reading scientific literature, and conventions of writing scientific research papers. For more intensive feedback, I offer writing conferences to discuss student work in depth. I have also assisted Dr. Miller with creating guidelines for the Undergraduate Honors Thesis.

Title: Principles of Plant Biology Lab (PBIO1210L)
Role: ½ WIP Teaching Assistant
Enrollment: NA
Term: Fall 2020
Course Description: Introduction to plant biology for non-majors
Responsibilities: My duties for this class were primarily to assist Dr. Barriga incorporate writing into her course. Specifically, she designed low-stakes assignments that that require reflection and/or developing a positional argument, which is unique among science courses. My primarily role was providing advice and sample feedback to the laboratory teaching assistants. As needed, I graded reflective writing assignments, meet with students to discuss their writing, and developed writing resources (ex. Citation guide).

Title: Genetics (GENE3200E)
Role: Teaching Assistant
Enrollment: Approximately 100 students
Term: Summer 2023
Course Description: Overview of genetics; provides the foundation for more advanced or focused classes. General topics included DNA replication, transcription, translation, pedigrees, inheritance, linkage, chromosome structure and chromatin. Online, condensed summer course.
Responsibilities: Created recitation slides (reviewed lecture material and practice problems), held biweekly 1-hour recitation sections (discussed key concepts required by practice problems, discussed questions), transcribed recordings of recitation sections for accessibility, graded exams.

Title: Evolutionary Biology (GENE3000)
Role: ½ WIP Teaching Assistant, Teaching Assistant
Enrollment: Approximately 90 students
Terms: Fall 2021, Summer 2021

Course Description: Foundations of evolutionary biology, writing intensive course (students are required to attend lecture and recitations); exams had essay questions to enhance critical thinking and writing skills.
Responsibilities: The professor of this course, Dr. Mauricio, noticed students struggled with written exam questions. Students would often run out of time and misunderstand or omit required information. My role was to address these challenges with student writing. To give tips on responding to exam questions, I created and delivered a workshop that covered evaluating the question (i.e., expectations and required components, key information from the prompt), time management, and concise writing. Additionally, I developed writing assignments, provided feedback, and graded exams.

Title: Evolutionary Biology Lab (GENE4230L)
Role: ½ WIP Teaching Assistant
Enrollment: 24 students
Terms: Spring 2019
Course Description: Advanced laboratory course; students performed several short, hands-on projects which were reported as a scientific research paper.
Responsibilities: For this course, I feedback on student papers, which the students incorporated into a revised draft for credit. To address common questions and/or misconceptions of the content, I created handouts based on my observations of the first draft. I attended class, delivered a workshop on scientific writing, and led a guided paper discussion.

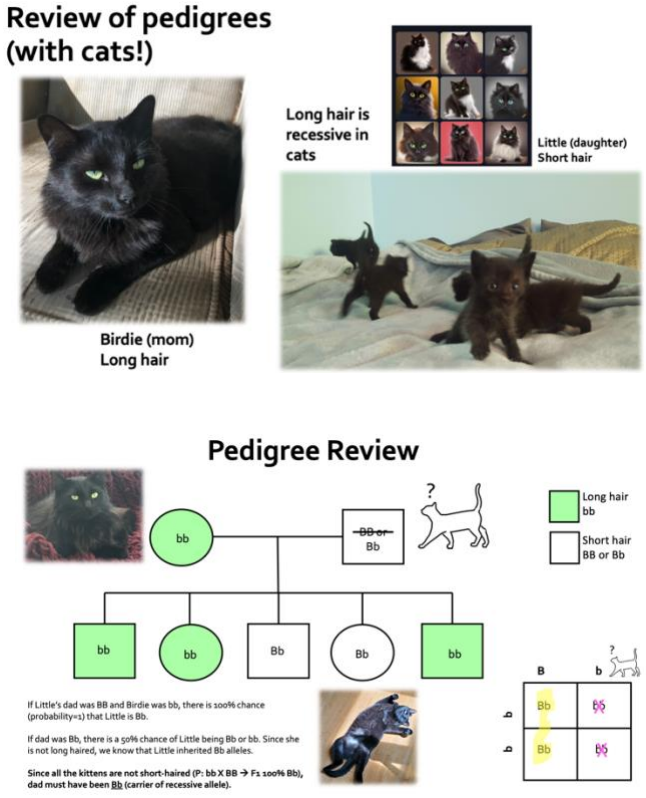
Title: Principles of Biology II Lab (BIOL1108L)
Role: Graduate Laboratory Assistant, WIP
Enrollment: 44 students
Terms: Fall 2020
Course Description: Inquiry-based introduction to biology, with a focus on biodiversity, ecology, and evolution. Students completed a group research project and reported their findings through oral presentation and independent scientific research papers.
Responsibilities: Developed presentations to review relevant concepts and low-stakes opportunities to practice writing (i.e., reflections, forming hypotheses and predictions). Led discussions and field trips. I evaluated weekly homework assignments, provided feedback, and held writing conferences. Guided the development and implementation of group research projects.

Title: Honors Evolutionary Biology (GENE3000H)
Role: ½ WIP Teaching Assistant
Enrollment: 22 students
Terms: Fall 2018
Course Description: Foundations of evolutionary biology for honors students. Emphasized active learning with student engagement (i.e., participation, activities, discussions, and projects) and scientific writing.
Responsibilities: Evaluated and provided feedback on homework assignments and projects. Developed and delivered workshop on scientific writing and deciphering figures, in preparation for a project. Other responsibilities including holding writing conferences, attended class (which also allowed me to observe Dr. Andrews's incredible teaching), and providing input on Dr. Andrew's assignments and rubrics.

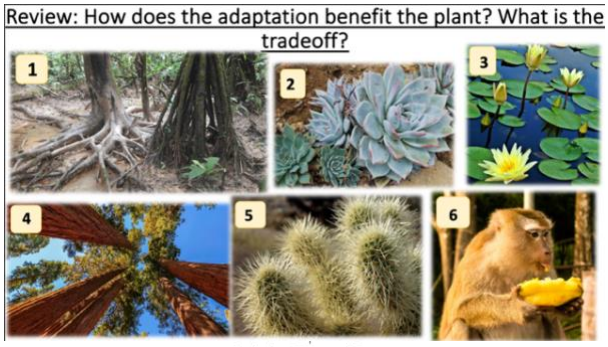
Title: Literacies in STEM, Freshman College (UNIV2113)
Role: Instructor of Record
Enrollment: 44 students
Terms: Summer 2019
Course Description: Through Freshman College and the Division of Academic Enhancement, the goal of this 6-week intensive class was to prepare incoming freshman for success as a science major. Students built foundational skills in data analysis, deciphering the scientific literature, written and oral communication, and critical thinking.
Responsibilities: Developed lecture slides, activities, and handouts; evaluated student assignments and group projects. Coached students on study tips, citations, scientific writing, and data visualization. Provided feedback on student writing. Met regularly with Dr. Colvard to discuss learning objectives, teaching strategies, and classroom management.

Sample teaching materials

Reviewing key concepts: One challenge for some students in science majors is understanding how complex processes operate within the cell. To help students connect with the concept, I used an example that they could more easily visualize and relate to: cats! For GENE3000E, I created slides to explain how alleles ("versions" of a gene) interact (dominant vs. recessive alleles), and how they are inherited. Pedigrees can be challenging, so I described a scenario ("Say cat hair length has Mendelian inheritance, with short hair encoded by the dominant allele. If a kitten is short-haired and her mother is long-haired, what was the father's genotype?"). Next, I reviewed Punnett squares, and we completed the pedigree together. This example was used to capture students' interest and review key concepts before diving into the assigned practice problems. Most importantly, the question underlying this scenario was real—one of my friends became curious about why her cats displayed this inheritance pattern, which inspired her to learn about the same topics we taught in class. I explained this to the class as a reminder that we do science in our daily lives, and that everyone can learn about science.



Reflective writing: When teaching BIOL1108 Lab, I liked to begin class with a brief reflective writing session. The prompts were typically inspired by topics covered in the previous lab. Low-stakes writing provides the opportunity to explore ideas and make connections, especially without any pressure to receive a grade. After jotting down their responses, we talked about it as a group. This served as both an opportunity to highlight examples to provide additional context, and for students to recall previous information and apply it to a new question.



Data visualization: Visualizing data is a foundational skill when communicating science. To provide students with an activity that represented the types of data a scientist might collect for their research, I developed a plotting activity for UNIV2113. I prepared a handout with a scenario ("Imagine you are a primatologist studying gibbons…") with different research questions and sample. Once identifying the objective, type of data collected, and sketching how the plot could look, as a group, we discussed how to represent that data in a plot and what features should be included. After I demonstrated how to make the plots in Excel, the students created their own. This activity provided a template for how to approach homework questions. Later, I adapted this activity for BIOL1108 Lab, as many students were unfamiliar with Excel and lacked confidence creating plots required for their group research project.

Activity: Types of Data

Imagine you are a primatologist interested in studying gibbons. To learn more about these fascinating creatures, you collected data to explore their life history. Now you are interested in visualizing that data with plots.

1. Gibbons have evolved specialized shoulder, hand, and arm adaptations which allow them to move speedily through the trees. This motion is called brachiation. You decide to record the speed of a gibbon at regular intervals over a short period of time.

Your data looks like this:

Time (min.)	Brachiation speed (MPH)
1	20
3	30
6	35
9	30
12	32
15	28

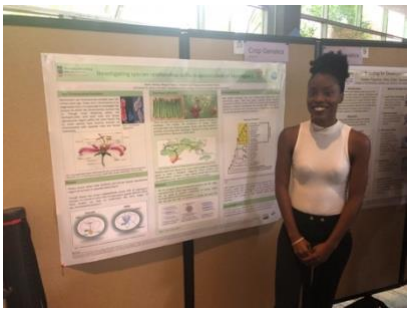
Is brachiation speed numeric or categorical? How do you know?
Numeric because it's measured as a number

Example 3
Diet composition

	Berries	Fruits	Seeds	Leaves
Ape 1	50	60	20	10
Ape 2	45	70	10	8
Ape 3	60	65	30	5
Mean	51.6667	65.0000	20.0000	7.6667
Std. Dev.	7.6376	5.0000	10.0000	2.5166

Which do you think would be more effective: plotting the mean food category, or each ape?
If plotting the mean, what else do you have to include?
What type of plot do you think would best represent this data?
Create the plot.

Samples of student work



Mentoring: In addition to the classroom, I enjoy training students to conduct research. Over the summer of 2018, I co-mentored Raven H. for her research project with the summer Crop Genomics. Raven worked in the lab to prepare and enrich DNA sequencing libraries for a set of genes shared across plants. The goal of this work was to establish an updated phylogeny of the genus *Asparagus* to learn how sex chromosomes could have evolved. In addition to her work in the lab, Raven read research papers to understand the context for her work. With this background, she was able to design a poster and explain her research at both the program poster session and the Fall 2018 Plant Center Retreat.

From Spring 2020-Spring 2021, I mentored Nicole Steel in the research course BIOL4960R and for her Honors Thesis. Nicole contributed to my own research project by helping me collect fireflies for pigment biochemical analysis, in addition to isolating DNA from fireflies and preparing it for sequencing. Following this, Nicole swiftly changed gears to conduct bioinformatic and statistical analyses with code. She approached troubleshooting PCR with determination!

Writing: In this assignment, I asked students to respond to a practice exam question, which included forming a hypothesis and predictions. The focus of this assignment was to express understanding of key concepts in evolution through writing, evaluate a scenario, and predict outcomes. When giving feedback, my goal was to identify misconceptions and what components could use additional specificity and/or explanation. I also give positive reinforcement, which is something I learned from Dr. Andrews; students remember praise. Pointing out what a student has done well increases the likelihood they will continue doing it.

Example 1

Natural selection in a population is defined as any consistent difference in fitness among phenotypic variants. The necessary elements for natural selection to occur include variation, inheritance, and selection. Natural selection has operated in urban rats because all of these elements are described in this scenario. The selective agent acting on the urban rats' population in the scenario is the rodenticide. For the urban rats' population to be rebounded after 20 years of using the pesticide, there must have been variation or mutations occurring in the genes encoding for resistance to the rodenticide before cities began using that rodenticide. It is expected that the frequency of the toxin-resistant variant of the gene VKORC1 would be higher after the use of rodenticide in the 1950s because rats possessing this variant would have a higher chance of survival and therefore would be more like to reproduce and pass on this variant of the gene to their offspring. If cities stopped using rodenticide, I think the allelic diversity of the VKORC1 gene would decrease. I hypothesize this would occur because there will be no selective agent acting on the population. Using a different type of rodenticide in the future could lead to either the same outcome of natural selection or a different outcome. If the same outcome of natural selection occurs, the rats would have had to already have a mutation variant in a gene causing them to be resistant to the new rodenticide used. If a different outcome occurs and the rat population remains decreased, this would indicate that there was no mutation for a variant in a gene encoding the resistance to the new or different rodenticide.

My feedback (Example 1): "Check directionality here (your logic is correct!): "If cities stopped using rodenticide, I think the allelic diversity of the VKORC1 gene would decrease. I hypothesize this would occur because there will be no selective agent acting on the population." -- how would genetic drift/mutation affect the now neutral locus over time?

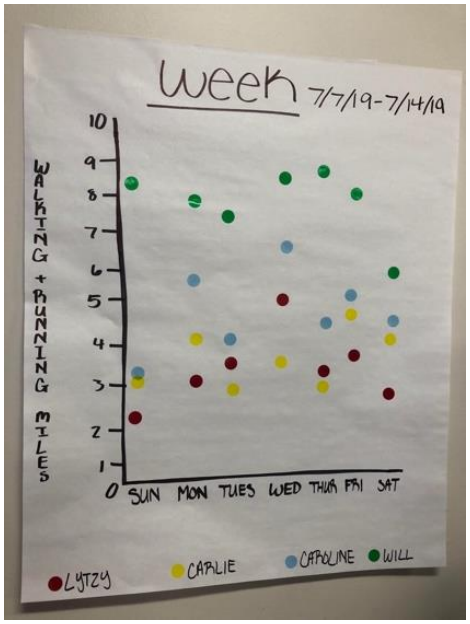
With mutation in mind, consider this: "Using a different type of rodenticide in the future could lead to either the same outcome of natural selection or a different outcome. If the same outcome of natural selection occurs, the rats would have had to already have a mutation variant in a gene causing them to be resistant to the new rodenticide used. If a different outcome occurs and the rat population remains decreased, this would indicate that there was no mutation for a variant in a gene encoding the resistance to the new or different rodenticide." -- what would you expect over time? Could there be many targets for selection?"

Example 2

Part 1: Natural selection operated on the urban rats as the rat population evolved to have a resistance toward the selective agent which was the rat poison (rodenticide). Initially the rat population did not need a resistance toward rodenticide as it was not a selective agent on the rats prior to the 1950s. Therefore, a mutation towards rodenticide resistance would not be favorable as it would not lead to an advantage towards the normal rat population, and it may also lead to an unfavorable metabolic tradeoff. However, after the introduction of rodenticide in the 1950s, the frequency of the toxin-resistance variant of VKORC1 gene would increase as the rats with this gene variant would be able to survive the rodenticide and reproduce which would lead to the increase in of the toxin-resistance variant of VKORC1 gene as the offspring would also likely have this variant. If the cities stopped using rodenticide against the rat population, the allelic diversity of the VKORC1 gene would increase as there is likely some rats in the population without the toxin-resistance variant of VKORC1 gene. As the toxin-resistance variant of VKORC1 gene would no longer lead to a selective advantage, more rats would then have the normal variant of the VKORC1 gene as both variants lead to the same amount of fitness. It is also possible that the VKORC1 gene becomes more prominent as usually mutations such as the toxin-resistance variant of VKORC1 gene have some sort of metabolic tradeoff for the resistance. Using a different type of rodenticide in the future would most likely lead to the same outcome. If the rat population was introduced to a new type of rodenticide, the rat population would then need to evolve to overcome this selective agent through some sort of mutation to have resistance to the new toxin (the mutation may be on a different gene). The rats with this mutation would be the majority of rats that survive and reproduce which would lead the eventual decrease in the overall allelic diversity, and the increase in the allelic frequency of the toxin-resistant gene variant. If the use of the new rodenticide was stopped after a period of time, the allelic diversity would then increase as rats with the toxin resistant gene variant would not be favored, and rats with the normal gene would also be able to survive and reproduce just like in the circumstance with the rodenticide.

My feedback (Example 2): "You did well to walk the reader through your logic. "However, after the introduction of rodenticide in the 1950s, the frequency of the toxin-resistance variant of VKORC1 gene would increase as the rats with this gene variant would be able to survive the rodenticide and reproduce which would lead to the increase in of the toxin-resistance variant of VKORC1 gene as the offspring would also likely have this variant." is particularly strong because you provide your rationale for these observations. Great job assessing the last question in part 1. You thought about it from many angles and provided a strong, clear explanation for each: "would then need to evolve to overcome this selective agent through some sort of mutation to have resistance to the new toxin (the mutation may be on a different gene)"

Experiential learning: For UNIV2113, Dr. Colvard designed a lesson where students track their activity over a week and then in small groups, practice plotting their own data. This was a great way to shift their perspective from methodology (i.e., figuring out how to plot in Excel) to strategies for communicating data. Students made their own decisions for how convey their data clearly and efficiently. Once all the groups had finished, for each plot we discussed their challenges and what worked well when visualizing the data. My goal was to give students the freedom to try something out; if features of their plot were difficult to interpret, it was not treated as a mistake—rather, an opportunity to understand how to improve their communication.



Explanation of innovative teaching projects and roles

Workshop for essay questions: Students in the sciences typically do not encounter many opportunities to receive feedback on their writing. However, some science courses such as Evolution have a substantial writing load, as students must respond to essay questions on exams. This can be challenging, because students must demonstrate that they understand the question and ensure their response contains a concise response, while under a time constraint. To address this, I developed and presented a writing workshop on responding to essay questions on exams in Evolution with Dr. Mauricio. This workshop contained strategies for interpreting the question (i.e., what information am I expected to provide?), some phrases to guide their response, and discussed several types of practice questions. Following this workshop, the students had an opportunity to revise an essay question from their exam and receive feedback from me for partial credit.

Feedback on exam questions: Based on the input from previous teaching assistants for this course, I developed a practice exam question to target a concept that students typically struggled to understand. To foster interest and relevancy, the question incorporated a real-life example (adaptation of rats to urban environments), with links to a journal and news article if students were interested in learning more. As with the previous assignment, students submitted first and revised drafts. However, this question required students to design an experiment, which required critical thinking to form and test a hypothesis, in addition to a brief explanation of how students would evaluate the outcomes. In response to the first draft, I provided comments targeting their understanding of the content and writing style. By reading both drafts, I could assess how well students grasped the concept and incorporated my feedback. This was a useful exercise for me because I realized the importance of explicit instructions to set up the students for success.

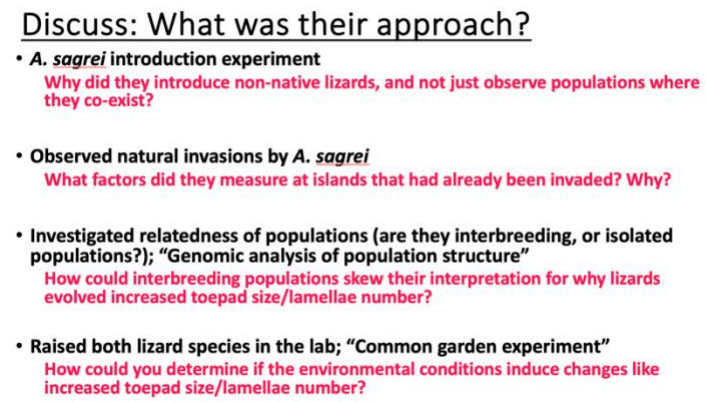
Writing Assignment

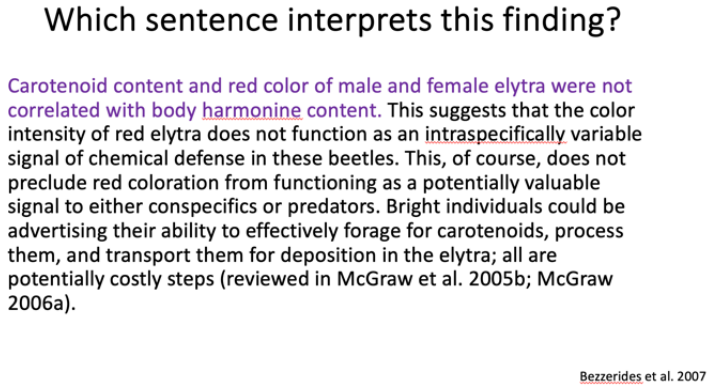
Scenario:
Rats are synonymous with city life but haven't always called the concrete jungle home. As our urban areas grow, many rats have moved out of natural areas into cities where they have plentiful access to food and shelter. Increased resource availability and population density also increased rodent disease rates, posing a risk to human health. In the 1950s, cities began using a rat poison (rodenticide) to reduce rat populations. Within 20 years, urban rat populations rebounded suggesting resistance to rodenticide. Scientists discovered this resistance was conferred by polymorphisms in the VKORC1 gene.

Part 1) Explain how natural selection has operated in urban rats. In your response, include the following information:

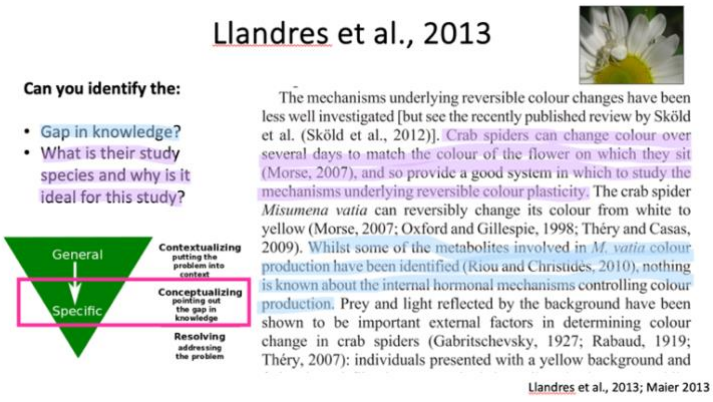
- What is the selective agent?
- Is frequency of the toxin-resistance variant of VKORC1 higher or lower after rodenticide use in the 1950s?
- If cities stopped using rodenticide, what would happen to allelic diversity of VKORC1 over time?
- Would using a different type (i.e., different mechanism) of rodenticide in the future ultimately lead to the same or a different outcome?

In-class discussions: For UNIV2113, one class was devoted to reading and interpreting scientific literature. What better way to learn than do! I was inspired by a resource we used in Honors Evolution with Dr. Andrews (Science in the Classroom: https://www.scienceintheclassroom.org/research-papers/theres-new-kid-town), which features supplemental information (videos, in-depth explanations of key topics, and highlights various components of a research paper). In preparation for our discussion, I asked students to read the annotated article and created a worksheet with guiding questions. My goal was for students to learn how to begin identifying key information from the paper (i.e., what was the question, what did they do, what did they find and how was it interpreted), how to break down figures (i.e., what do the axes/features represent, what pattern is shown), and how to retrieve information they were unfamiliar with. We began by watching a video on the lizards that highlighted their unique adaptations to solidify their understanding of the background. As a group, we discussed the driving questions and identified key steps of the methodology (black bullet points), with students contributing responses from their homework. In pairs, students discussed the pink questions with each other and did their best to decode jargon (black text, phrases in quotes. To conclude the discussion, we regrouped to review their responses and discuss strategies for approaching scientific literature.





Writing in Biology Lab: Students in Biology Lab were required to perform a group research project and present their work as a scientific research paper. They submitted a rough and final draft, with peer feedback and a writing conference with me. After reviewing their rough drafts, I created a series of slides that included instruction on a specific writing topic and brief activity. I noticed that many students struggled with the Discussion, so I developed a workshop on how references as supporting evidence. To provide a simplified example, I selected a passage from the Discussion of a research paper. After reading, I asked students to identify the sentence that contains their 1) result, 2) interpretation of the result, and 3) evidence that supports their interpretation. My goal was to show students a real example of scientific communication and techniques they could use to strengthen their own writing.



Supporting research courses: To provide students enrolled in research courses (BIOL49X0R) with guidance while in writing their 10-page research paper, I developed and presented three virtual workshops throughout the semester on Writing the Introduction, Methods & Results, and Abstract & Discussion. In

addition to describing the sections of a scientific paper, each workshop included a breakdown of the assignment guidelines for transparency.

List of teaching-related professional development and training experiences

Service

- Line Editor and Reviewer for student publication The Classic. *Fall 2018 – Fall 2021*
- Undergraduate Writing Retreat Mentor. Developed writing resources and workshops on Professional Writing and Revising. Conferenced with undergraduates about their writing (variety of subjects). Fall 2022

Guest speaker

- Guest Speaker, First Year Odyssey Seminar on Fireflies taught by Dr. Kathrin Stanger-Hall. Presented "Luciferase biochemistry and firefly light color." *9/7/22*
- Panelist for GRSC7770 taught by Dr. Andrew Bonnano (previously PhD Candidate, Instructor of Record) from the Anthropology Department. *Spring 2020*
- Graduate student panelist for Dr. Lindsey Harding's undergraduate course Writing in the Disciplines (ENGL3700). *Spring 2020*
- WIP Pedagogy for Biology, Ideas for Teaching Science Writing. *2/3/20, 8/31/20, 2/2/21, 8/30/21, 1/24/22, 9/12/22, 1/23/23*

Coursework & Professional Development

- Participated in Future Faculty Fellows Program (Winter 2020 – Winter 2021); worked with group to lead "TA Café: Writing Diversity Statements" presentation for UGA teaching assistants. *Winter 2021*
- Seminar in Teaching Biology (PBIO8010) for 1 credit.
- WIP Pedagogy (WIP7001) for 3 credits.
- Attended Write@UGA lecture and workshop with Dr. Asao Inoue: "Bravely Challenging Our White Language Supremacy in Our Assessments of Student Writing"

Scientific Education and Outreach

- Led community event "Fireflies at Sandy Creek" with 1-hour talk followed by evening walk to observe fireflies at Sandy Creek Nature Center in Athens, GA. *Summer 2023*
- Presented "All About Fireflies" talk to public at Hard Labor Creek State Park, Rutledge, GA. *Summer 2022*
- STEMzone Co-Leader for "Diversity Tree of Life" outreach booth with Genetics Graduate Student Association (GGSA); developed plant-pollinator co-evolution activity; served as event volunteer. *Fall 2019*
- Created and presented "Fun with Fungi" outreach event with fellow Genetics graduate student Felicia Ebot-Ojong at the Athens-Clarke County (ACC) Library. Fall 2021
- Established firefly outreach program ("Team Firefly Monitoring") with EcoReach and the ACC Library. Awarded $1,470 grant to collaborate with the public library by providing activity kits. Developed field guide, virtual monitoring survey, website with resources on fireflies: https://ecoreach.ecology.uga.edu/virtual-activities/firefly-monitoring/. Concluded with "Let's Talk Fireflies" discussion and outreach event. *Spring 2021 – Summer 2021*

- Created video on research project for Sandy Creek Nature Center "Women in Science Week." *Spring 2021*
- Wrote social media post about fireflies for Sandy Creek's "Night Life" Weekly Theme. *Summer 2021*
- EcoReach Member (student outreach group); coordinated outreach with afterschool program at Athens-Clarke County Public Library (2021) participated in community events that educate and communicate science to a broader audience, including: Interviewed for EcoReach podcast, Lovin Elementary Classroom Visit (gave presentation and led activity: "Pollution in Georgia"), STEMZone (facilitated "Meet Your Nature Neighbor" booth), Insectival (facilitated freshwater invertebrate booth), Bogart Book Fair Event, ecology/environmental science, and facilitated documentary screening of "Chasing Coral." *Summer 2017 – Present*

Evaluation of teaching from students and colleagues

Qualitative feedback from Principles of Biology II Lab:

- "Professor Popecki is a great teacher and is very involved in helping her students learn. She explains things very well and I was able to gain a greater understanding for concepts discussed throughout this course. While she is a tough grader. I feel that I learned a lot from her instruction and became a much better scientific writer."
- "Margot Popecki was an excellent instructor. Her enthusiasm radiated in the laboratory and made the learning experience much more enjoyable."
- "Margot's feedback was very helpful in facilitating the evolution of my scientific writing throughout the semester."
- "I thought Margot was an exceptional TA. She was well-prepared, willing to help, and fair. She also showed perseverance when managing the class was tough (due to the class' nature)."
- "Margot was a wonderful TA and was always interested in stimulating our knowledge beyond just the required information. I really appreciate all of the effort she put in to help us with our writing skills and towards answering questions."
- "This lab was very demanding and tough at times, but Margot was always ready to answer any kind of questions you may have. If you didn't quite understand what she was asking or explaining, she was always happy to give clarification. The course was intense and a bit above my usual level of coursework for a lab, but it definitely challenged me and made me work harder. Margot made labs fun and enjoyable while still giving us all the information we needed to succeed. She was a fantastic instructor for this lab."
- "Margot was very good at engaging the entire class and making sure everyone participated. She always encouraged us to think beyond what was asked of us and apply outside knowledge to come to conclusions which was very helpful. She was also always very excited about what we were doing because she has an interest in research herself so she was able to use what she learns in her research to help us and make the class more understandable and engaging. She made the class seem more relevant and important."
- "Margot has to be one of the best TA's that I've worked with. She's accessible both in class and out of class and made sure everyone had the help they needed."
- "Margot was a very good teacher. She was very approachable and willing to help."

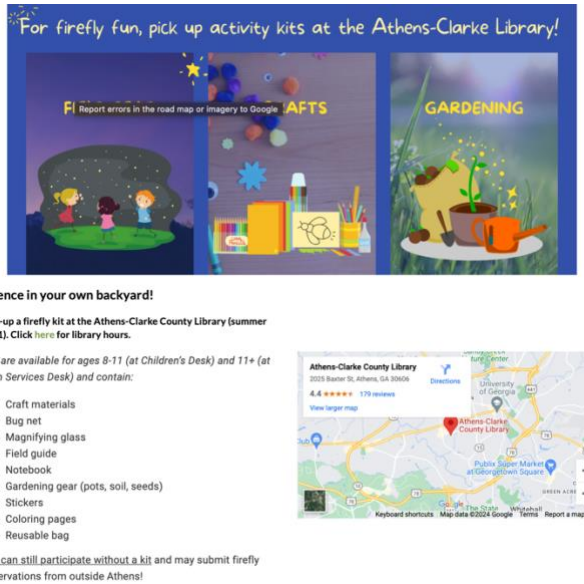
Anecdotal feedback from BIOL49X0R (via email):

- "I truly appreciate the feedback that you gave me and it helped me make a better research paper."
- "Thanks for the revisions, they are really eye-opening to the things I missed and needed improvement on."
- "Thank you so much for taking the time to give feedback on my paper! Your comments were really helpful."

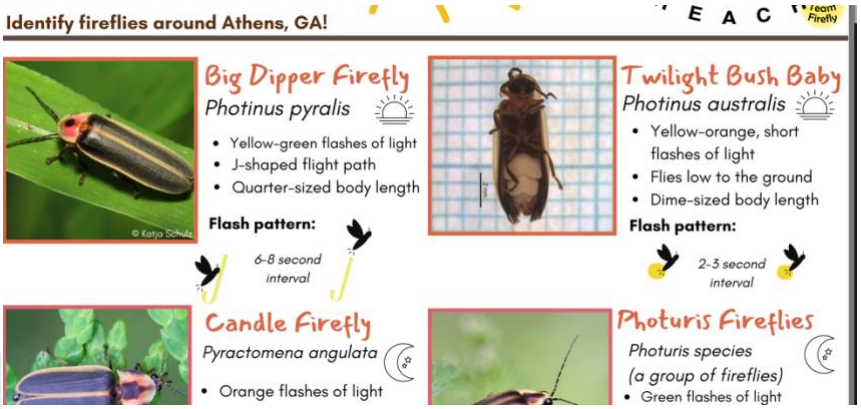
Contribution from Dr. Lindsey Harding:

"As the Director of the Franklin College Writing Intensive Program (WIP), I have had the pleasure and honor of working with Margot since 2018, when she was first nominated for a WIP TAship in genetics. Since then, Margot has worked with WIP in a wide variety of capacities, including serving as a writing coach in undergraduate writing-intensive genetics lecture and lab courses; supporting all biology research courses, which all require students to write scientific research papers; supporting a large plant biology lab course with multiple sections and its own team of graduate lab assistants; guest lecturing for a pedagogy of writing in the disciplines seminar each semester on what it means to teach writing in introductory biology lab courses; participating in WIP's fall orientation as a returning TA and mentor for incoming TAs; hosting a special question and answer zoom event with UGA Grant and Senior Science Writer Kat Gilmore; and preparing videos and digital resources to support student writing in the sciences (view here). In every interaction, Margot has demonstrated a keen and comprehensive dedication to student learning, a passion for advancing scientific writing instruction here at UGA, a strong work ethic, excellent interpersonal skills, and an infectious energy that saturates the learning environment. Margot is my go-to graduate student in the sciences, the first person I turn to with a new opportunity or project to support undergraduate science student writing. She cares deeply about developing her pedagogy and teaching practices—and even more about her students and their learning. When she graduates, WIP will lose an incredible asset but the academy will gain an inspiring teacher-scholar."

Snapshots of the Firefly Project with Athens Area Public Library



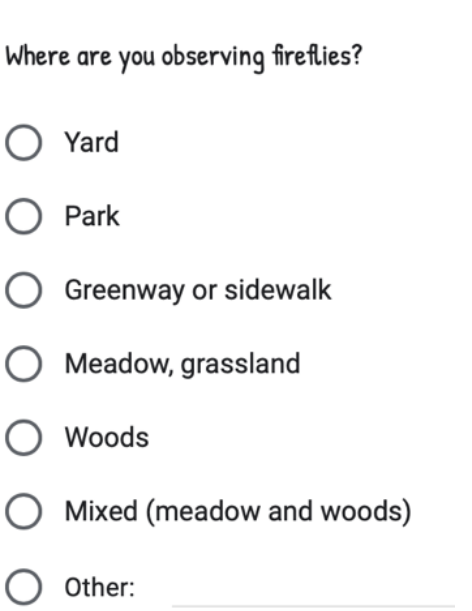
Information about kits and where to pick them up.
We encouraged people without kits to participate anyway!

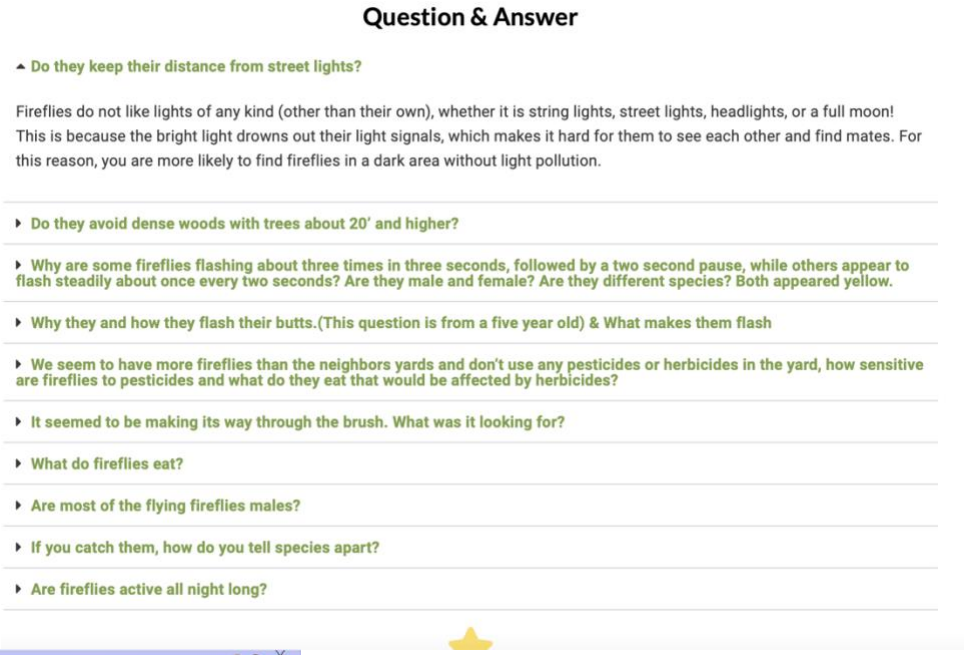


Field guide (excerpt)
I took the *Photinus australis* photo in our lab! The firefly was collected in Watkinsville, GA.

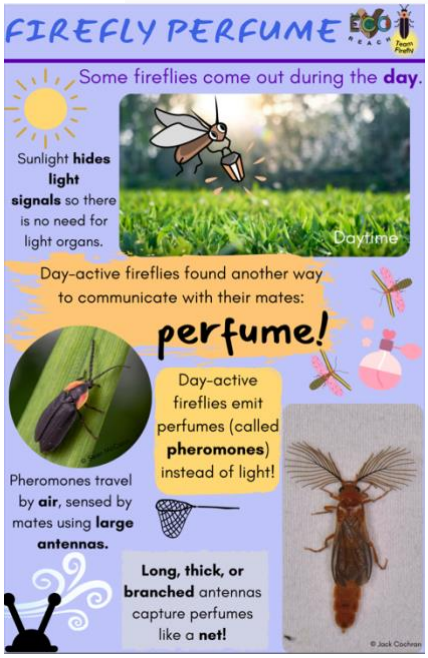
Survey
Participants were encouraged to observe fireflies with their adults.

Question & Answer
Participants could ask questions at the end of the survey.





Educational Page (p. 1 of 4)
Topic: Light signaling (my research focuses on the signal color)

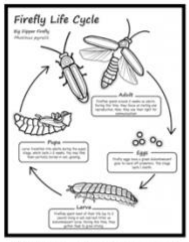


Educational Page (p. 3 of 4)
Topic: Communication with pheromones

Certificate of completion
Awarded to participants at the in-person program.

Coloring Pages
Drawn by Carmen Kraus, UGA Alum. These pages were later used as outreach at the Great Smoky Mountains National Park!

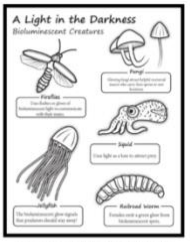

A Meadow Display



Firefly Growth & Development

Color by Number


Blue Ghosts: A Magical Forest Scene



Creatures Who Make Light