



Grounded in Wonder

Lower School Teacher Laura Pupillo cultivates curiosity, adaptability, and deep roots in young scientists

On spring evenings in Shaw Nature Reserve in Gray Summit, Missouri, the air is filled with the sound of croaking frogs, chirping crickets, rustling trees, and a babbling brook. On one particular night, **Lower School Science Teacher Laura Pupillo** looks up into the night sky, and she smiles. She is leading a handful of colleagues and more than 50 fourth graders on a night hike in the reserve, and the sounds of nature are accompanied by giggles, wandering flashlights, and the crunchy steps of little shoes on the path. As a teacher, this is her favorite time of the year. "It's so magical; one student told me it's like being at Disney World," she said. Like most magic, it can't be described, only felt.

The annual fourth-grade overnight at Shaw highlights Pupillo's core philosophy of teaching: Learning should be meaningful, hands-on, and filled with connections. She excels at carefully curated moments of wonder in the outdoor realms and in the natural chaos of the classroom. She said, "I really believe in place-based education, and I love to do citizen science projects with our students. It's so important to get them out into the environment and their community."

Pupillo is a strong advocate for ecology and the environment. She is certified by the Missouri Stream Team, has worked with the Conservation Department, and has friends who are botanists and foresters. Here at MICDS, she developed a campus stream team for third and fourth graders. They study ecosystems, conduct cleanup, and remove honeysuckle, among other activities. Several times a year, she takes students to the nearby Litzsinger Road Ecology Center, an outdoor laboratory for ecological education, research, and restoration.

Another equally important tradition for fourth-grade scientists is the annual Sustainability Fair, where students choose a topic that reduces a negative impact on the earth. Pupillo is amazed by the students' ideas. She said, "One student really loves soccer, so he created a soccer cleat that's sustainable and is supposed to help you save the bottoms of your shoes. Another student created a turbine that would go in a drain, so it can spin as you're washing your hands or doing dishes."

High-Tech Meets High-Touch

On campus, Pupillo makes great use of the Lower School courtyard just outside the science and art classrooms. "When I started, it had been sitting for a while, and it's such a perfect place to go with the kids. It can be a messy laboratory; we have tables, and now we have vegetable garden beds for the kids to explore. We've pulled the ornamental plants and planted native species. It's student-led, so it doesn't always look beautiful, but we now have milkweed, which will attract monarch caterpillars in the fall," she said.

Pupillo also pairs standard science lessons with technology. She said, "Although our lessons are rooted in the Next Generation Science Standards, if students seem really interested in something, I try to make time for those interests, which lends itself perfectly to lessons in the makerspace." The Lower School Makerspace is home to 3D printers, a Glowforge 3D laser printer, Cricut machines and ChompSaws, a green screen for video production, and endless amounts of robotics and maker materials. Students learn Tinkercad early so they can model their ideas for a research project before using hands-on tools. "It helps us ask questions like, 'How big is that going to be? Do you have enough space? Will this spin? If so, it needs a spot for the motor.' We are always using math to measure, collect, and analyze data. I tell the students all the time that math is science's best friend. You can't really do one without the other," she said.

Pupillo and **Robyn Williams, Lower School Coordinator of Instructional Technology**, often partner to incorporate robotics into the science curriculum. They've created several engaging lessons with Ozobots and Sphero Indi Cars, which students code to learn about animal migration patterns, pollinator paths, and hibernation sequences, to name a few. "One of my favorite tools I use with first through fourth graders has been LEGO Essentials. Fourth graders were learning about plate tectonics, and LEGO Essentials has a kit that serves as an earthquake-machine lab. So they built the machine using code, then built different LEGO structures and tested them with the machine to see which structure was stronger and could withstand higher magnitudes. They collected data along the way, and they loved it. It was so much fun. In first grade, students built pollination machines with a pollinator that rotates on a motor to demonstrate how it collects and distributes pollen to and from flowers. All of the projects involve a circuit, so they either have to light an LED or they have to spin a motor," she said.

With a master's in education focused on math and science, she has a firm belief that not all science should be in a silo and cross-curricular learning is beneficial to all subjects taught in school. Together with the JK-12

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math and science department chairs, **Diane Broberg** and **Paul Zahller**, they have designed several theme weeks for Lower School students. From exploring (and exploding!) pumpkins and icy winter weeks to hot air balloons and pollinators, the team, along with homeroom teachers and art, Spanish, PE, and library specialists, designs a week filled with engaging activities across disciplines centered on a specific thematic unit. In a simple unit about craters on the moon, Pupillo added mini-themed lessons on rocketry following the Artemis II mission and collaborated with Zahller to launch rockets at the Shaw overnight, including lighted stomp rockets for the evening festivities. “Those times are important,” she notes. “We have to be able to break from curriculum to connect with those special once-in-a-lifetime moments.”

Adaptation in Action

The field of science is constantly changing, and Pupillo moves just as fast. She began teaching at MICDS in the fall of 2020. She said, “I met my students for the first time on a computer screen. I decided that everything we do needs to be hands-on and engaging. So I created simple labs and made all these little science kits for each student. I remember measuring out countless containers of baking soda. It was a lot of work.”

During the extensive renovations of the Beasley Lower School, employees had to keep flexibility at the forefront. Pupillo and other specialists experienced an additional transition from losing their dedicated classrooms to gaining rolling carts that traveled to each homeroom for their lessons in art, science, library, and Spanish. While it was challenging to cull science materials that once fit into a large classroom workspace down to a couple of rolling carts, the pivot spurred Pupillo to adjust former workflows to achieve greater efficiency.



For example, each spring the science classroom becomes home to several baby chicks. Before construction, students would have scheduled times to travel to science view, hold, and learn about the chicks. Pupillo quickly realized that carting the chicks around to the homerooms and hallways was much easier, as there are fewer chicks than students and they’re much smaller. “When they’re on the cart in the hall, even middle schoolers can see them and they get excited.”

Post-construction, the courtyard will retain its value as an outdoor classroom. “There are lessons I did in the courtyard [vs. a homeroom] just because of the mess factor. And I found myself asking, why did I ever do this inside? This is much better! I can just hose it off, and it’s done,” she said.

Deep Roots & Finding Grounding

Pupillo’s deep connection to teaching began long before she ever set foot in an MICDS classroom. As the oldest of six siblings in a military family, teaching came naturally to her. She recalls making worksheets for her siblings, and “having school” was just a natural part of her life. She took early childhood classes in her senior year of high school and worked at a lab school at Jefferson College, eventually getting hired there as a preschool teacher and a parent educator with Parents as Teachers. “We were constantly working with practicum students and student teachers, and it was a great way to learn about education,” she said.

Through her continued education and the jobs that followed at The Souldard School and Saul Mirowitz Jewish Community School in St. Louis, she explored and tested instructional practices



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to meet the needs of all students while maintaining her own curiosity in advancing the teaching of science. "At Mirowitz, we chose interesting environmental topics to discuss with our state representatives in Jefferson City," she said. At Souland, she took students on field trips and most often rode public transportation to get there. "Getting kids outside and getting them involved in what matters is important. I want them to know that they don't have to be a grown-up to make a difference and to change the world. They can work on that at any time."

Understanding what young learners need was also shaped by her own experience navigating life as a military child. "When I was in second grade, I went to three different schools because my dad was in the military. By third grade, I had this teacher who, looking back, probably had experience working with military kids. We are constantly having to say goodbye to friends and homes and be the new kid everywhere we go. Mrs. Nordel was calm, organized, and patient. I appreciated her predictable schedule and the time she made for projects. She was a few years away from retirement and was like a grandmother teacher who loved us. We did some great projects, planted a garden, and did a class play. I cried on the last day of school. You're at that certain age of reasoning, and I'm so glad that she brought some stability and groundedness to me at that time," she said.

Pupillo grounds her current students in similar ways. "The early years in a person's life are foundational to the person they will become as an adult. I always start class the same way. We set the intention for what we're going to do. Students have science notebooks, and I think taking a little bit of time to reflect with pencil and paper really goes a long way. It's a great reflection piece for me also to see if they really are grasping a concept," she said. When the lab takes off, Pupillo becomes mobile, walking around, checking in with students, helping them tweak their experiments, asking questions, pointing out observations, and encouraging them to be curious. In Pupillo's classroom and in the makerspace, the technology is layered into the framework that everything is figureoutable. The science of caring about each student and where they are in the moment lays the groundwork for future discoveries.

Pupillo admits that one of the most challenging parts of her job is starting a project or getting really involved in something; she has a hard time turning it off. "There are really exciting projects out there in the world. And in the work of science, there's always something amazing. But sometimes you just have to choose what your focus is on, because there is only so much time," she said.

When Pupillo is not carting around baby chicks or building chemical reactions to explode pumpkins, she tends to the land, children, and animals on her hobby farm of 11 years, which has grown with the addition of more than 100 trees. It makes sense. Her first connection to science was with nature, from the catalpa tree in her grandmother's yard to the Eifel Forest in Germany, where her dad was once stationed. "I spent every day in the forest, which helped grow my interest in environmental science. Standing underneath something so big and giant really grounds you. When you think about its history, some are thousands of years old, and everything that tree has seen...it's just awe-inspiring."



Beyond the Lab

What's your favorite season of the school year and why? Spring. We know the kids so well by then, and we have great momentum. Plus, the earth is coming back to life, which is great for field studies.

What's your favorite time of day? I'm a night owl. I enjoy the quiet after a busy day.

What's your top MICDS memory so far? Our night hike at Shaw. You walk down to the boardwalk, and the frogs and toads are all making noise. It's just my favorite.

What's your favorite campus lunch? I've loved the Middle School salad bar this year! I also love Indian food, so I'm thrilled whenever Flik makes anything with curry.

What would we be surprised to know about you? I used to be a wedding photographer.

What's been your biggest science experiment fail? At Souland School, we took public transportation to do stream team work at Forest Park. We lugged all our equipment and rain boots onto the bus. Right as we were finishing up, I fell into the creek. I was totally drenched and still had to haul all the gear on and off multiple buses with the students.

What's your biggest science experiment win? Teaching science on a cart last year. All the experiments went so well, but doing elephant toothpaste [an impressive peroxide, yeast, and soap chemical reaction] on a cart was a really big win. Normally, kids take their labs to the sink, but this time I just dumped their trays into a five-gallon bucket and washed it all later. It was so much less stressful.

What's your favorite science rabbit hole? Ecology. If there's news about plants or water, I'm reading it. I also love psychology and the study of human behavior. I love visual things, but I love data too.

What's your go-to hype song on your way to work? I listen to literally every genre. My all-time favorite is Tom Petty, but on any given day, it could be '90s country, the Flaming Lips, or Ozzy Osbourne.