



Patterns in Nature
Winter 2020



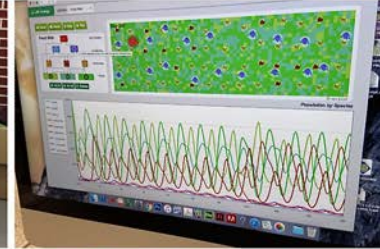
If a child is to keep alive his inborn sense of wonder, he needs the companionship of at least one adult who can share it, rediscovering with him the joy, excitement, and mystery of the world we live in.”- Rachel Carson

Rachel Carson mentions the need for one adult- you worked with seven! :)

It was our pleasure to direct this spring's interdisciplinary Stars Challenge enrichment course. We welcomed the opportunity to network and coordinate the talents and expertise of many extraordinary teachers such as Mr. David Fusco, Ms. Aimee Babbin, Mr. Matt D'Amato, Ms. Diana Burich, and Dr. Martino. In addition, our TA Erin Quinn contributed as an exemplary role model. We were also lucky to have an enthusiastic group of students whether we were in the classroom, laboratory, or field study sites. Most people think of the classroom with the flow being from teacher to student. In our case, the classroom became a positive feedback loop (a pattern we didn't teach you!). We all learned from each other and walked away each evening looking forward to the next week's gathering.

Thanks for being so much fun!

Mr. Roche and Ms. Gross



The introductory lesson on natural selection challenged "organisms" to compete for prey, as well as having students manipulate computer models to balance populations in simple ecosystems.



W
WEEKLY
SCHEDULE
SCHEDULE

PENN STATE
SYMNASTICS

CALIFORNIA
San Francisco

SHREWSBURY
BASKETBALL

NEWSEY
SHORE

PINK



Deoxyribonucleic acid may seem complicated, but Mr. Fusco's hands-on demonstrations made DNA easy as 1-2-3.



What's even better than eating fruit? Extracting the DNA within! Mr. Fusco helped us to extract nucleic acids from strawberries and bananas. We made a bit of a mess, but had a ton of fun!



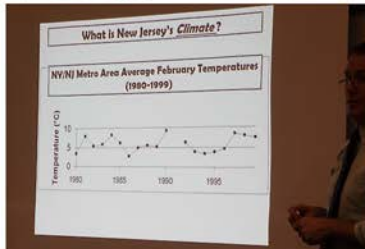
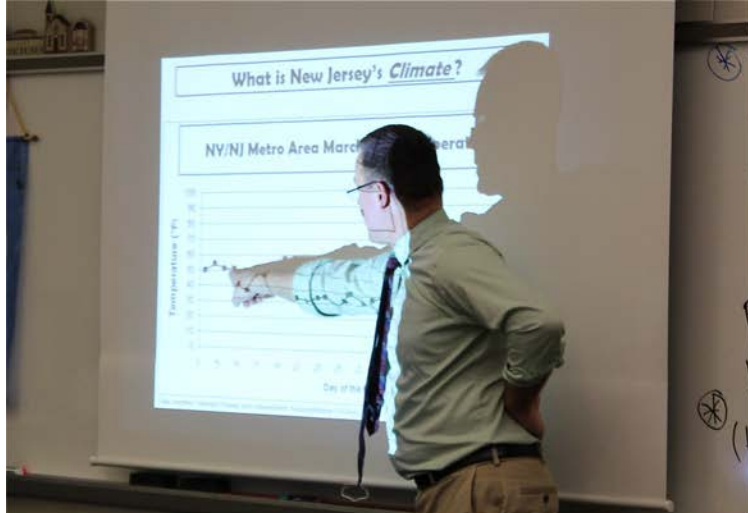
Some of our students seemed more impressed with their extractions than others.



Polar vs. non-polar substances. From shaving cream tie dye to whole milk and food dye creations, we learned about the properties of water while demonstrating our artistic sides.



So much (surface) tension! (Who was more worried - our students or Ms. Babbin?)



Mr. D'Amato challenged students to develop questions using local NJ data sets related to climate vs weather.



Complex polymers are much easier to grasp when you model them with candy and make your own oobleck!



Monomers make polymers.



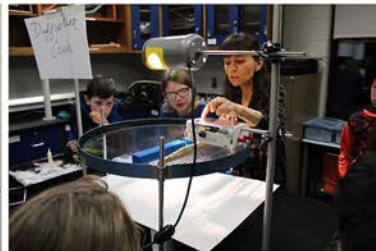
Super absorbent polymers have so many uses. We used diapers as an example and were amazed by how much water each held before leaking!



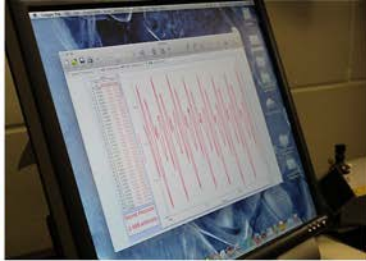
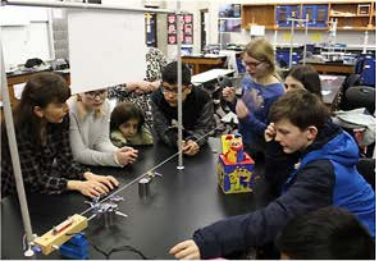
Continuing our study of polymers with non-Newtonian fluids, like oobleck. Depending on the force we applied, the oobleck went from a thin, liquid-like state to acting like a solid!



Ms. Burich helped us learn about camouflage in the marine environment and then we got to create (and hide) our own camouflaged fish.



Studying patterns in waves became so much more appealing when Dr. Martino brought out the giant Slinkys.



We were intrigued by the science behind what happens when we measured and visualized sounds from a jack-in-the-box, strings plucked on a guitar, or light patterns produced by a diffraction grating.



We were encouraged to explore sounds produced by our own instruments that evening.



Species of lightning bugs / fireflies have evolved signals that use precise patterns of flashes to locate and attract mates. Mr. Roche challenged us to mimic those patterns by programming a microcontroller and LED bulbs.



Our Brookdale / HTHS campus provided a perfect setting for our final session that challenged powers of observation, logic, cooperation, spatial awareness...



... calculation, creativity, perception and interpretation.



Eco-art created by our creative students.

