

Rigorous - Educational - STEM Focused - Hands-on - Fun

All Gelfand Outreach Fall Saturday Series Classes are held 9am - noon and are \$50 per class.
Please contact us for information about scholarship options.

HIGH SCHOOL DIVISION GRADES 9-12

DISEASE OUTBREAKS, GRADES 9-12

October 1st

High school students interested in biology, join us in a CMU Biology Lab. Class will take place in the Mellon Institute located on Bellefield Avenue in Oakland. In this class, you will track a SIMULATED disease outbreak. You will perform an ELISA or enzyme linked immunosorbent assay to determine if you have been exposed to a contagious "disease". The ELISA uses antibodies to detect the presence of a disease agent, for example, viruses, bacteria or parasites in your blood or other bodily fluid. You will then track the disease back to its source. You will learn how an ELISA works, and learn about the field of Immunology. It is important to emphasize that this is a SIMULATED lab, that is, you are NOT working with any pathological agents that cause disease. Because you will be in an actual biology lab, students must wear closed-toed shoes and follow the safety rules in the lab. Lab coats, goggles and gloves will be provided.



Dr. Carrie Doonan is the Director of Undergraduate Laboratories and Teaching Professor in the Department of Biological Sciences at Carnegie Mellon University. She was educated at Chatham College (BS) and the University of Connecticut, (Ph.D) and began her teaching career at Carnegie Mellon University in 1993. Her primary area of focus involves the teaching and administration of a range of experimental laboratories in the department. She is responsible for writing and developing experimental units, training of junior faculty and teaching assistants and is actively involved in all aspects of the undergraduate program. Dr. Doonan has adapted many of her curricular innovations for use in K-12 outreach and has been invited to present this work at regional and national forums. She served as a Biotechnology Institute National Biotechnology Teacher-Leader in 2003 and 2005 and was awarded the Julius Ashkin Teaching Award in the Mellon College of Science in 2000. She was also awarded the Mark Gelfand Award for Educational Outreach in 2011.

PRIMARY DIVISION GRADES K-2

BUG-BOTS, GRADES 1-2

October 22nd

Bounce your way into the exciting world of robots! Explore motion, power, electricity, and robots. Discover the way motors and batteries operate. Discuss robots and bugs and then create a robot, explain how it moves, and take the robot home to share with your family and friends! Parents are invited into the class at 11:45 for a Bug-Bot parade of all the class creations.

Christa Romanosky is a writer and educator. She has been working with the Gelfand Center for Service Learning and Outreach for over two years. She has a master's degree from the University of Virginia and a B.S. and B.A. from Carnegie Mellon University. She has taught classes for Gelfand Outreach and other workshops and K-12 courses for over nine years, creating engaging and fun curriculum for all learners.



INSECT DWELLINGS, GRADES K-2

September 24th

Ever wonder where insects live? Is it on a leaf, in a hive, or perhaps in an underground tunnel? In this introductory architecture class you will discover how insects of all kinds live. Explore the structure and habitat which they live within. You will be able to select an insect from ants, to ladybugs, or even butterflies and then design a home for your small friend to live!



Elizabeth Levy is currently a third year student in Carnegie Mellon University's School of Architecture. She has taught children K through 7th at the Anvil Art Studio, Camp Invention Program, Phipps Conservatory Discovery Center, and presented Sustainable Living Research to several class rooms of students in Pennsylvania. She has a background in art, design, and horticulture with interests in Biology, Sustainability, and Education. As a member of CMU's Architectural Outreach Program, Elizabeth's focus is to instill in children the importance of S.T.E.A.M. ideals and introduce architecture at a young age.

MAGNIFICENT MOLECULES, GRADES K-2

October 22nd and November 12th

Molecules can do some crazy things when you look at them in the right way. In this class, you will learn about the interactions between molecules that you witness on a daily basis. You will create beautiful marbled paper artwork to take home! As you experiment, you will discover properties of liquids such as adhesion, cohesion, and why water is considered a "universal solvent." You will also learn about the 3 phases: solids, liquids, and gases. You will use this knowledge to make your own homemade ice cream! You'll be surprised at how these magnificent molecules can be so yummy!

Cameron Breze is a third year student in Carnegie Mellon University's College of Engineering, double majoring in Chemical and Biomedical Engineering with a minor in Chemistry. He has worked as a personal tutor, classroom assistant, and mentor at PUCS Middle School and the Pittsburgh Science and Technology Academy over the past three years. Last year, Cameron acted as a Teaching Assistant for the Gelfand Outreach Saturday Series classes. Moving forward, his goal is to promote science by learning through experiment and creative thinking.



WRITE-ON SCIENCE, GRADES 1-2

November 12th

Discover Bioluminescence, Light Emitting Diodes (LEDs) and Poetry! Everyone loves fireflies that light up at night, but did you know lots of different animals glow and light up, including fish, mollusks, bacteria, and mushrooms? Learn how these animals and fungi use their lights for good and for hunger! And they're not the only ones who benefit from bodies that light-up. Discover how scientists are using bioluminescence to help solve problems in our world. Bioluminescent trees instead of street lights? Glow-in-the-dark exit signs? It could happen! Adventure into uncharted territory as you create your own bioluminescent creature using LEDs and solar pigment, and write on science in the form of an ode poem to your favorite glowing creature.



Christa Romanosky is a writer and educator. She has been working with the Gelfand Center for Service Learning and Outreach for over two years. She has a master's degree from the University of Virginia and a B.S. and B.A. from Carnegie Mellon University. She has taught classes for Gelfand Outreach and other workshops and K-12 courses for over nine years, creating engaging and fun curriculum for all learners.

MIDDLE DIVISION GRADES 3-8

BUILDING UP! GRADES 3-5

September 24th

From concept sketch to building, skyscrapers must be designed with geometry and physics in mind. Learn the math, science, and design behind skyscrapers. Work as a team and work individually to add to Pittsburgh's skyline. How can a new skyscraper be inspired by geometry found in native Pittsburgh plants?



Samantha Weaver is the director of CMU's Architecture Explorations outreach program and has expanded program offerings and tied lesson plans directly to current architecture trends and the expertise of local Pittsburgh architects. Samantha's goal is to provide an architectural foundation for children and youth; fostering appreciation of the built environment, encouraging creative expression and critical thought, and inspiring civic responsibility. In Building Up!, Samantha will guide students through the architecture design process as they research native Pittsburgh plants and use organic geometry to create towering structures. Samantha graduated from CMU's School of Architecture in 2011, with a Bachelor of Architecture and a focus on sustainable design, participatory design, and K-12 education. During her education, Samantha completed a thesis designing adaptable learning corridors in schools and taught summer camps at the Carnegie Museum of Art.

ENERGY FROM EVERYDAY THINGS, GRADES 5-7

November 12th

Many of the things we use every day can be used to help generate clean energy. Did you know that you can trap sunlight and generate energy from blackberry juice? Did you know that you can run a car on water? No? Then come and experience two amazing projects designed in the laboratory of Carnegie Mellon University Professor Reeja Jayan. Maybe, what you have for a snack while reading this paragraph can help power our future!

B. Reeja Jayan is an Assistant Professor in Mechanical Engineering at Carnegie Mellon University (CMU). She also holds a courtesy appointment in the Materials Science and Engineering department at CMU. Prof. Jayan received her M.S. in Electrical Engineering and Ph.D. in Materials Science and Engineering from The University of Texas at Austin (UT-Austin), working with Professor Arumugam Manthiram. She was subsequently a Postdoctoral Associate in Chemical Engineering at the Massachusetts Institute of Technology (MIT), working under the supervision of Professor Karen Gleason. Her multidisciplinary research group at CMU explores novel design strategies for organic (polymers, small molecules), inorganic (metals, semiconductors, insulators), and organic-inorganic hybrid materials for applications in energy and sustainability. Her work has resulted in 18 peer-reviewed journal publications and filing of 4 patent applications. She is a recipient of the Cockrell-School of Engineering Student Leadership Award from UT-Austin, a doctoral fellowship from the American Association of University Women (AAUW), and the H.H. The Maharaja of Cochin Endowment Prize from the University of Kerala, India.



ENGINEERING 101, GRADES 5-7

September 24th

What is engineering and how do engineers design new systems and products? Engineering marvels are all around us, and are essential parts of our everyday lives. In this class we will explore the engineering design process and how engineers overcome challenges of mechanics, environment, and change. Students will face an engineering challenge, design and test a solution, and more importantly "redesign" to improve on the original idea. Students will see how fundamentals of math and science are used in the engineering design process as well.



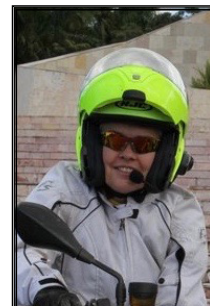
Dr. Deanna H. Matthews is Associate Department Head for Undergraduate Affairs and Assistant Teaching Professor in Engineering and Public Policy (EPP), and Education Director and researcher in the Green Design Institute (GDI) at Carnegie Mellon University. In her role in EPP, Dr. Matthews oversees the undergraduate programs. In the GDI, an interdisciplinary research center that focuses on the intersection of environmental and economic issues, her research centers on the development and deployment of the Economic Input-Output Life Cycle Assessment tool, examining energy life cycles of new products, corporate environmental management, and educating general populations about energy-environment issues. As Education Director, she oversees education and outreach initiatives for the GDI. She is the coordinator and instructor of outreach programs to K-12 students and teachers in school settings and informal educational events. She received her B.S.E. in Civil Engineering from Duke University (1994) and her M.S. (1995) and Ph.D. (2001) in Civil and Environmental Engineering from CMU.

LIVE SMART, THINK SMALL, GRADES 6-8

November 12th

Have you been building things for as long as you can remember? Learn about civil engineering and architecture as we talk about 'tiny houses.' You will build a model of a 'tiny house' and in small groups, you will assemble the 'tiny houses' to make a condominium. Using math, we will talk about how the size of the rooms in a tiny house compares to your own home and how a condominium helps to conserve land. You will take your model home and be able to use it as a pencil box or a night light.

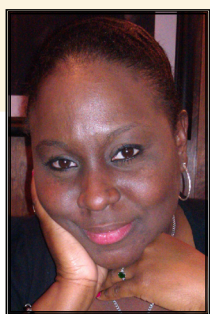
Dr. Deborah Lange is an environmental engineer that has worked in academia as well as in small and large businesses. Currently, she is the Director of Special Environmental Project for the Steinbrenner Institute at Carnegie Mellon, where she has been for the last 17 years. She is a graduate of The Pennsylvania State University (BS, Civil Engineering) and Carnegie Mellon (MS and PhD, Civil and Environmental Engineering.) Deb is active in the Pittsburgh community as a Director of the Allegheny County Conservation District and is a past president of the Engineers' Society of Western Pennsylvania. She also enjoys 'STEM' outreach and is working with Propel Charter high schools as well as the Sarah Heinz House Boys and Girls club. Deb has 3 adult children: a medical doctor, an architect, and an environmental engineer. She enjoys tinkering at TechShop and international travel with her husband, including motorcycling adventures in Europe & in Cuba.



MARVELOUS MACROMOLECULES, GRADES 4-6

October 22nd

The existence of life is dependent upon nature's ability to manufacture very large, complicated molecules such as DNA and proteins. The ability of chemists to prepare really big molecules called polymers in the laboratory has revolutionized the manner in which we live every day. In this workshop students will explore just some of the variety of polymers, their usefulness and the work to make them in a manner which demonstrates care for the environment. This hands-on workshop will have students working in the lab and participating in lecture demonstrations to explore the amazing world of polymer chemistry.



Dr. Gizelle A. Sherwood is currently an Assistant teaching Professor at Carnegie Mellon University. She earned her Ph.D in 2008 where her research focused on the effects of aggregation on the photo-physics of oligomers related to MEH-PPV and CN-PPV. She primarily lectures Quantitative Chemical Analysis laboratories to the sophomore chemical engineers, biology and pre-med student. She is also involved in several outreach programs working with both the Boy Scouts of America and the Leonard Gelfand Center.

SOLAR ENERGY, GRADES 4-6

November 12th

You've heard that the sun can provide enough energy to power the whole world, but how is that energy harnessed? Why isn't this powerful, renewable, clean energy source used more often? Learn the basics of heat and how solar energy is used today, how a solar furnace can be used to heat your house in the winter and build your own solar hot water heater to take home with you to share. Solar energy, it's hot!

Kristin Lavery has been the Assistant Director of the Leonard Gelfand Center (LGC) for Service Learning and Outreach since January of 2013. She joined the LGC after completing her Master of Arts in Teaching (grades K-6) at Chatham University in December of 2012. Kristin coordinates tutoring programs in the local Pittsburgh area where CMU students act as after school tutors, or teaching assistant and mentors in classrooms. Kristin also develops activities and workshops for presentation at schools and K-12 STEM related events in the area.



SUPER HEROES AND VILLAINS: WRITE AND CREATE CHARACTERS AND THEIR WORLDS! GRADES 3-4

September 24th

Have you ever thought about what kinds of superheroes you WISH existed? Or what types of superpowers you wish you had? Fly, teleport, and rappel into this creative writing class and craft your own unique superhero and the world they are battling to save. We'll work on everything from naming and designing your hero, to creating rules for the world in which they live. You may even want to create a villain instead! Create a short story and use dialogue to share with family and friends. Parents are invited into the class from 11:45-noon to hear about each student's hero.



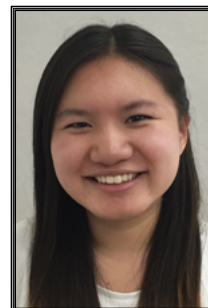
Christa Romanosky is a writer and educator. She has been working with the Gelfand Center for Service Learning and Outreach for over two years. She has a master's degree from the University of Virginia and a B.S. and B.A. from Carnegie Mellon University. She has taught classes for Gelfand Outreach and other workshops and K-12 courses for over nine years, creating engaging and fun curriculum for all learners.

WHY THINGS FALL DOWN, GRADES 3-5

September 24th

We see all the buildings around us that stand up; what about the ones that fall down? Why do they fall down? Explore how extreme weather and climate can influence buildings around the world, and learn about the forces that make them stand. Design a building that can survive a hurricane, a tornado, or an earthquake!

Kelly Li is a student at Carnegie Mellon University currently studying architecture with an interest in design and education. She has previous experience teaching kids aged five through thirteen at Carnegie Mellon's School of Architecture Saturday Sequence, Carnegie Museum of Art, Summer Dreamers Academy at Faison, and Hunakai Studio of Fine Arts. Her goals include teaching others about how the creative design process can begin to positively influence the environments around us.



Gelfand Outreach Fall 2016 Saturday Series Classes.

*Classes are \$50.00 each and are conducted from **9am to noon** at Carnegie Mellon University. Scholarships are available through the Bernard Meisner Fund. Please contact us for information about scholarship requirements. Scholarships are limited to one class per student.*

September 24th

Insect Dwellings, Gr. K-2
Super Heroes and Villains, Gr. 3-4
Building Up!, Gr. 3-5
Why Things Fall Down, Gr. 3-5
Engineering 101, Gr. 5-7

October 22nd

Magnificent Molecules, Gr. K-2
Bug-bots, Gr. 1-2
Marvelous Macromolecules, Gr. 4-6

October 1st

Disease Outbreaks, Gr. 9-12

November 12th

Magnificent Molecules, Gr. K-2
Write-On Science, Gr. 1-2
Solar Energy, Gr. 4-6
Energy from Everyday Things, Gr. 5-7
Live Smart, Think Small, Gr. 6-8