

# GELFAND OUTREACH

*Rigorous - Educational - STEM Focused - Hands-on - Fun*  
Spring 2019 Saturday Series Classes - Carnegie Mellon University

*All Gelfand Outreach Spring Saturday Series Classes are \$55 per class from 9AM to noon.  
Scholarship funds are available through gifts from several Carnegie Mellon alumni. Please see last page to learn more.*



Luca Damasco

## **ANIMATIONS WITH THE WICK EDITOR GRADES 5-7** February 16<sup>th</sup>

In this class students will learn how to use the Wick Editor to create 2-D digital animation. Students will have an opportunity to create digital illustrations and learn the basic principles of animation to bring their artwork to life! We'll be using the Wick Editor to create our animations and the skills learned in the class will be transferable to any animation software. No experience required!

Luca Damasco likes making things that help people make things. He has a background in Computer Science and Art, and focuses on developing accessible creative tools for artists and students. Luca has worked for Riot Games as a Technical Artist, contributed to The Processing Foundation's Python mode project, and co-created WickEditor.com. Currently, Luca is a Masters student in the Human-Computer Interaction Institute at CMU.



Zach Rispoli

Zach Rispoli is a toolmaker, game developer and digital illustrator interested in the creation of digital artifacts and culture as a way of learning. He works to make creative processes such as animation and game creation more accessible through free and easy-to-learn tools. Zach is the co-creator of WickEditor.com along with Luca Damasco.



Kelly Li

## **ARCHITECTURE OF SOUND GRADES 3-4** March 23<sup>rd</sup>

Have you ever noticed different places where your voice echoes, or places where the sound is very hushed? Learn about the science of acoustics, and how sound can change depending on the shape of a room or its materials. Brainstorm your own ideas for a soundspace, then build a model of it!

Kelly Li is a student at CMU currently studying architecture with an interest in design and education. She has previous experience teaching students ages 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.

## ARCHITECTURE WITHOUT WALLS GRADES 3-4

January 26<sup>th</sup>

How do architects design the spaces between buildings? In this workshop, students explore an introduction to landscape architecture concepts, such as topography, horticulture, and sustainability. Students will be designing their own parks, integrating elements of playgrounds, gardens, and pavilions.

Kelly Li is the instructor for this class. Please see her biography on the previous page.



John Choi

## ARTIFICIALLY INTELLIGENT CHATBOTS GRADES 5-7

March 23<sup>rd</sup> or April 6<sup>th</sup>

Want to learn how systems like Amazon Alexa and Google Assistant work? This hands-on workshop will give students a taste of the artificial intelligence side of robotics with simple speech recognition and basic natural language understanding. This workshop will feature a brand new, experimental full-size humanoid robot called the ASPIR (Autonomous Support an Positive Interaction Robot), developed at your local friendly neighborhood robotics company, Choitek LLC. Students are expected to know how to use PowerPoint, the Internet, and other basic computer tasks. At the end, students will leave with a fully functional AI chatbot loaded onto a USB flash drive.

John Choi is a robot programmed with a mission to teach and inspire the generation of tomorrow. With a Bachelor of Computer Science and Arts Degree from CMU, John has over 10 years experience building software, hardware, robots, video games and everything in between. As a CMU Innovation Scholar, he founded a tech company called Choitek in 2016, Pittsburgh's friendly neighborhood humanoid robotics company. John also does a bit of research at CMU LTI's Articulab, an artificial intelligence research lab for social good. He has volunteered at the Carnegie Science Center, AssemblePGH, Carnegie Mellon's Leonard Gelfand Center, Project Ignite, Robotics Club, and was awarded the Gelfand Student Service Award in 2017. John is truly an artist, engineer, and entrepreneur all in one.



Jacob Churilla

## BUG BOTS GRADES K-2

April 6<sup>th</sup>

Bounce your way into the exciting world of robots by exploring motion, power, and electricity. 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.

Jacob Churilla is very excited to be teaching Bug-Bots! Currently he is the Program Administrator for the Leonard Gelfand Center. In addition to being a musician, poet, and public speaker whose ambition is to lead others to reach their full potential, Jake previously worked with Bradford School where he traveled around the Tri-State area giving lectures to high school students. A graduate of CMU (BFA Vocal Performance A'17), Jake has spent much time with the Leonard Gelfand Center and has fostered a passion for educating young STEM innovators!



Dr. Aswin  
Sankaranarayanan

## **CAMERA AND DISPLAYS GRADES 5-7**

April 6<sup>th</sup>

Building your own cameras and displays is not just fun, but good engineering practice. This workshop will have three parts. First, we will go over the history of imaging, basics of optics and photography, and operating principles behind a modern digital camera. Second, we will convert your cellphone into a microscope and use it to magnify tiny objects and explore interesting subjects. Third, we will understand how we see in 3D and build a 3D display, the opposite of a camera.

Dr. Aswin Sankaranarayanan is an Associate Professor at CMU. He earned his Ph.D. from University of Maryland, College Park where he was awarded the distinguished dissertation fellowship for his thesis work by the ECE department in 2009. Aswin is currently the PI of the Image Science Lab at CMU (<http://imagesci.ece.cmu.edu>), whose research consists of a diverse portfolio, ranging in topics from optics, computer vision, and image processing.



Marieke Van Der Maelen

## **DRAMA IN 3D GRADES 7-9**

February 16<sup>th</sup>

Are you the next Lin-Manuel Miranda? Are you totally obsessed with gaming apps or world building? Come join us as we delve into the quirky world of live theatre and digital performance space. You will learn how augmented reality (AR) is shaping the future of immersive theatre. Using paper engineering techniques, you will construct your own 3D scale model of a black box theatre. Then, with the aid of Unity game development platform, learn some AR basics to overlay digital characters or special effects onto your set design. You will be able to take home your theatre, complete with working stage lights! NOTE: The AR creations are both IOS and Android compatible.

Marieke Van Der Maelen is a 3D modeler and product of the Carnegie Mellon Pre-College Art program. Through CMU, she was exposed to local art conservators, and later pursued a career as an art conservator in Chicago, where she preserved period clothing for the Harley Davidson Museum in Milwaukee, conserved ethnographic textiles from Japan and West Africa, and restored a rare Finn Juhl "floating couch." Her desire to share her knowledge with the next generation as well as connect traditional conservation practices with modern technology led her to bring her work to the classroom where she taught the science behind art conservation to students at the University of Chicago's Charter School System. Her background in art, science and education continue to inform her current research: combining augmented reality with blockchain to redefine how people experience and interact with visual art, culture, and entertainment.



Dr. Matthew Walker

## **EYES ON THE UNIVERSE GRADES 4-6**

January 26<sup>th</sup>

Learn the basic design of optical telescopes, and explore the cosmos with a guided tour of the solar system, our Milky Way galaxy, and far beyond -- all based on images captured by the world's best observatories. Then use household materials to construct a simple working telescope that will let you see farther!

Dr. Matthew Walker is an assistant professor of Physics at CMU. In his work as an observational astronomer, he uses large telescopes, including the Hubble Space Telescope, to study dark matter and the formation of galactic structure.



Dr. Meredyth Wegener

## **GENES YOU'RE ALWAYS WEARING** GRADES K-2

April 6<sup>th</sup>

Have you ever wondered what makes you...you? Explore DNA, genes, biology and heritability. Discover the reason behind your connected earlobes and widow's peak. Choose the genes to create your own creature and take your knowledge home to share with your family and friends!

Dr. Meredyth Wegener is a Visiting Teaching Professor at University of Pittsburgh in the Department of Neuroscience. She earned her B.A. in Neuroscience from University of Virginia and her Doctorate in Neuroscience from University of Pittsburgh. She completed her dissertation after conducting research in adolescence and reward learning using awake-behaving electrophysiology in the laboratory of Dr. Bitá Moghaddam. Meredyth joined the Carnegie Mellon community through the Center for the Neural Basis of Cognition, and became involved with Gelfand Outreach and Creative Technology Nights or "TechNights", which specializes in introducing middle-school girls to STEM topics, in Fall 2017.



Lydia Jahl

## **GO GREEN!** GRADES 3-5

March 23<sup>rd</sup>

This workshop is about environmental awareness and sustainability. What does being environmentally sustainable mean? Can one person's everyday choices really make a difference? Students will explore different types of pollution, tackle current environmental issues, and investigate the positive and negative effects that humans have on the Earth. In-class demos will show how easily water can be polluted and how carbon dioxide emissions can heat up air in less than an hour! Join us as we brainstorm how anyone can take action and help make our planet a safer and healthier place to live.

Lydia Jahl is a 4th year Ph.D. student in the Department of Chemistry at CMU. Her interest in atmospheric chemistry began while earning her Bachelors of Science in Chemistry at Harvey Mudd College. She is currently a member of the CMU Center for Atmospheric Particle Studies, where she studies how the emissions of wildfires affect different chemical and physical processes that happen in our atmosphere. Lydia hopes that this class will teach young students how their individual actions impact our planet and what we can all do to improve our environment.



## **LIQUID SCIENCE** GRADES K-2

March 23<sup>rd</sup>

Normal liquids can do crazy things when you look at them in the right way. Did you ever think you could watch them crawl on top of or below other liquids? Float objects and sink them upon command! Come and perform experiments with acids and bases and discover a magic pitcher that changes between a pink and clear solution in a matter of seconds. As you try out these tricks, learn about cohesion and adhesion in liquids. You've never seen liquids this crazy!

This class will be taught by a member of CMU's DNA Zone. The DNA Zone is an educational outreach program focused on students in grades K-12. DNA Zone attracts students to science by exposing them to modern and exciting, state-of-the-art aspects of nucleic acids science. This program, fosters students' interest in science, technology, engineering, and mathematics (STEM).



Maggie McGrann

## **MAKING THE BANANA: COSTUMING AND PROCESSING 3D TO 2D GRADES 7-9**

9AM - Noon, March 23<sup>rd</sup>

In this workshop, students will learn the basic principles of cutting and draping, the technique most often used in theatrical garment making. This technique develops skills such as precise estimating of length and volume, negotiation of organic vs. geometric shapes on a human body, and translating those shapes from a 3D test model to a 2D pattern guide to a 3D cozy for a banana!

Maggie McGrann is a new MFA candidate for Costume Design in the School of Drama. Originally from Richmond, VA, Maggie has always found joy in collaborating with others and being in a classroom. She's worked for five years with the School of the Performing Arts in the Richmond Community (SPARC) in various capacities as a teaching artist and costume designer. Though her specialty is in the fine art of designing for the stage, Maggie has a lifelong goal of working with others to find the joy in the world around us.



Ally Rexrode

Allison Rexrode is an MFA student for Costume Production in the School of Drama. She first learned hand sewing as a child and found great satisfaction in making things with her own hands. As she grew up, she became interested in art professionally and found that her true love was making. In addition to gaining a BFA in Theatre at University of Central Florida, Allison has experience working in bridal and special events. She hopes to collaborate with other disciplines, bridging the gaps between art and the sciences.



Dr. Rebecca Taylor

## **NANOENGINEERING WITH DNA GRADES 4-6**

February 16<sup>th</sup>

Did you know that DNA can be used to make tiny nanostructures and nanomachines? Engineers can design structures that are 1/1000th the width of a single hair and these structures will build themselves under the proper conditions. Professor Taylor will introduce students to structural DNA nanotechnology. Students will physically interact with both the chemical structure and mechanics of DNA, acting like nanomanufacturing engineers who treat DNA as an engineering material. They will build DNA double helix models from pasta and then as the focus of the class they will build scale DNA origami models of double helical rafts and nanotubes using pipe cladding and lasercut wooden connectors (using a kit designed by the Taylor lab students).

Dr. Rebecca Taylor is an Assistant Professor in Mechanical Engineering at CMU. She also holds courtesy appointments in the Biomedical Engineering department and in Electrical and Computer Engineering (ECE) at CMU. Prof. Taylor received her B.S.E. in Mechanical Engineering from Princeton University and her M.S. and Ph.D. in Mechanical Engineering from Stanford University. During her doctoral research she worked with Professor Beth Pruitt developing microscale force sensors for studying the mechanics of stem-cell derived heart muscle cells. She was subsequently a postdoctoral fellow in Biochemistry at the Stanford University School of Medicine, working under the supervision of Professor James Spudich. She is the director of the Microsystems and Mechanobiology Lab and her research team uses micro- and nanoscale structures as sensors and actuators for investigating the mechanics of cellular and molecular biosystems.



Stephanie Blackwood

## **OWLS: WHAT A HOOT! GRADES K-2**

February 16<sup>th</sup>

What do owls look like? Where do they live? What do they eat? If you want to know the answers to those questions sign up for this workshop. You will discover the answers and much more as we explore the life, habitat and diet of an owl. You will be able to examine owl pellets, the regurgitated remains of an owl's prey, build a skeleton, make observations and determine what the owl ate. What a hoot, who will go out on a limb to join us?

Stephanie Blackwood is a sophomore undergraduate student at CMU and has been a part of the Leonard Gelfand Center's Saturday Outreach programs since her freshmen fall semester. She is studying biology and psychology with a minor in biomedical engineering while involved in on-campus biology research. In addition to her research, Stephanie has a passion for teaching. Prior to her time at CMU, she was a math and Spanish tutor, and over the summer, she is a teacher for Destination Science summer camp, where she leads science lessons about robots, programming, chemistry, and physics to students K-6.



Dr. Oliver Kroemer

## **PERCEIVING THE WORLD THROUGH ROBOT SENSORS**

GRADES 4-6

March 23<sup>rd</sup>

Which household chore would you like a robot to do for you? What does the robot need to know about its surroundings to perform that chore? We will explore different sensors and discover the various types of information that they provide. Learn about how robot sensors mimic human sensing capabilities and sometimes exceed them! Build a sensor-actuator loop that reacts to its environment. Learn how machine learning is making it easier for robots to perceive the world around them.

Dr. Oliver Kroemer is an assistant professor at the CMU Robotics Institute. His research interests are in machine learning and robotics, with a focus on learning for grasping and manipulation. Before joining CMU, Oliver was a postdoctoral researcher at the University of Southern California. He received his Masters and Bachelor's degrees in engineering from the University of Cambridge in 2008, and he defended his Ph.D. thesis at the Technische Universitaet Darmstadt in 2014.



Kristin Lavery

## **SOLAR ENERGY GRADES 4-6**

April 6<sup>th</sup>

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.



Dr. Carla Bevins

## STOCK MARKET GRADES 3-5

January 26<sup>th</sup>

What are stocks? How do people make decisions about buying stocks? See what it's like to be a stock trader by participating in a stock market simulation. Buy stocks, pay commissions, and trade stocks with your friends. We have a challenge for you: can you invest some "money" and turn it into a whole lot more? Play our game and find out!

Dr. Carla Bevins is an Assistant Teaching Professor of Business Communications in the Tepper School of Business at Carnegie Mellon University (CMU). Dr. Bevins taught in the School of Information Sciences at the University of Kentucky (UK) and as a Visiting Educational Scholar at Qingdao Technological University. She earned her B.A. in English and Creative Writing with a concentration in Public Relations from Butler University and her Ph.D. in Communications from UK. She holds Graduate Certificates from the UK in Health Communications, Medical Behavioral Sciences, Statistics, and Distance Education. At CMU, Dr. Bevins mentors undergraduate and MBA students and teaches Business Communications, Business Presentations, and Interpersonal Managerial Communication.



Jasio Santillan

## SUPER HERO SCIENCE GRADES 3-4

April 6<sup>th</sup>

Have you ever wondered how Spider-Man is able to swing through the Big Apple and stick to walls? Ever wonder why Wolverine's claws can cut through anything? Or even how Ant-Man is able pack a punch while he's so tiny? If you're curious how superheroes do what they do (and maybe even secretly want to become one yourself), then this is the class for you! Spend the day learning how we can use materials science to explain superhero powers and learn how to make some super-materials for yourself.

Jasio Santillan is currently completing his M.S. degree in Materials Science and Engineering here at CMU. He spent the previous four years getting his B.S. in Materials Science and Engineering with an additional major in Biomedical Engineering at CMU. His experiences include developing snake robots, testing artificial lung devices, synthesizing nanoparticles for drug delivery, and even fabricating synthetic marimba keys from fiber composites. He is currently studying self-healing materials and composites with tunable properties.



Dr. Coty Jen

## THE AIR WE BREATHE GRADES 3-5

February 16<sup>th</sup>

The Air We Breathe: Smog, Clouds, and Climate! The air we breathe is filled with millions of tiny dust particles and gas molecules emitted from trees, wildfires, cars, and thousands of other sources. These particles and gases affect climate, visibility, and our health. This hands-on workshop will explore the different ways dust particles form in the atmosphere to create smog and clouds. We will investigate how particles in the air impact Earth's climate.

Dr. Coty Jen is an assistant professor of Chemical Engineering at CMU. She is a member of the Center for Atmospheric Particle Studies. Her research focuses on how nanoparticles form and grow in the atmosphere and ultimately impact the environment. Her group designs and builds instruments for measuring the composition of 1 nm particles formed from manmade pollution and biogenic emissions. Her previous research examined the millions of organic compounds emitted during wildfires and how these compounds impact human health and air quality. Dr. Jen completed her B.S. in Chemical Engineering at Columbia University, M.S. in Chemical Engineering at University of Minnesota- Twin Cities, Ph.D. in Mechanical Engineering at University of Minnesota- Twin Cities, and postdoc in Environmental Science, Policy, and Management at University of California, Berkeley.



Dr. Gloria Silva

## **TINY HARD WORKING GUYS GRADES K-2**

January 26<sup>th</sup>

This workshop will show the students how microscopic organisms can do a fantastic and effective job transforming certain chemical compounds into gases among other things. We will use the Baker's yeast to produce CO<sub>2</sub> and O<sub>2</sub>. The first is produced by making the yeast eat sugar and the second by attacking the yeasts with hydrogen peroxide. Gases are invisible but we will find ways to demonstrate how they are formed. Our hands-on experiments will involve feeding sugar to the yeasts, preparing fluffy dough, and making a foamy mess with soap water. It will be a lot of fun!

Dr. Gloria Silva is an Assistant Teaching Professor in the Chemistry Department at CMU. Gloria received her B.S. in Organic Chemistry and Pharmacist degrees from the National University of Cordoba (UNC), Argentina. At UNC she was an Assistant Professor with tenure and a Researcher of the Argentinean Research Council. She performed research in Bioactive Natural Products from plants. Gloria and her family moved to Pittsburgh in 2002 and she has been at CMU since. She was involved in research in the field of Bioorganic Chemistry and has been teaching undergraduate and graduate courses since 2008. Her courses have a main focus on Organic Chemistry and courses that teach concepts at the interface between Biology and Chemistry including a course on Food Science.



Jiahe Liao

## **WEARABLE COMPUTERS GRADES 7-9**

January 26<sup>th</sup>

Bracelets that buzz, scarves that sense, ties that talk, blouses that blink— it's all part of wearable engineering! Students will learn about the rapidly developing field of wearable technology, and will design their own conductive fabrics and simple-to-program electronics. They'll also learn how humans and computers interact to form wearable technology, also known as "soft robotics". This class will inform and excite students about this electrifying subfield of mechanical engineering in our constantly upgrading world.

Jiahe Liao is a Ph.D. student in the Robotics Institute at CMU. He received his B.S. in Computer Science from National Taipei University, Taiwan (2015), and M.S. in Robotics from CMU (2018). He is working in the CMU Soft Machines Lab advised by Prof. Carmel Majidi. His research interests are in soft-matter artificial muscles for robots.



Dr. Michael Ford

Dr. Michael Ford is a researcher in the Soft Machine Labs at CMU. He earned his PhD from the University of California, Santa Barbara in 2018 before moving to Pittsburgh to work with Professor Carmel Majidi on developing new materials for soft robotics. His main research interests fall under the broad category of polymer science and engineering.

## **WEDO ROBOTICS GRADES 3-4**

February 16<sup>th</sup>

Explore the world of robotics using the LEGO® WeDo kit designed specifically for younger students. Build LEGO® models that feature working motors and sensors, then program them to move and react to the world using an intuitive "drag-and-drop" interface.

Jasio Santillan is the instructor for this class. Please see his biography on the previous page.



Dr. Emily Drill

## **WORM DOCTOR: GENES AND DISEASES GRADES 6-8**

April 6<sup>th</sup>

Doctors can learn a lot about diseases and the genes that cause them from examining case studies of patients. In this workshop you will be the doctor, with *C. elegans* as your patients. These microscopic worms may seem small, but they share about 35% of their genes with humans. They are a common model organism, meaning scientists can study them to better understand human biology. You will work together on case studies of *C. elegans*: examining symptoms, diagnosing illnesses, and comparing what you've learned to the symptoms of human diseases.

Dr. Emily Drill is an Assistant Teaching Professor in Biological Sciences at CMU. She has been teaching laboratory courses at CMU since 2012, in a variety of topics including genetics, cell biology, developmental biology, and neuroscience. She teaches high school students through summer programs including the Pennsylvania Governor's School for the Sciences; most recently, she worked with a group of students on a research project using CRISPR technology.



Dr. Rosalyn Abbott

## **YOU ARE WHAT YOU EAT GRADES K-2**

January 26<sup>th</sup>

Ever wonder what happens to an apple after you eat it? From bite to breakdown we will track its path. You will discover how food is processed and how we get energy from the nutrients. You will also create a model of the digestive system to take home to savor your experience. Can't you just taste the fun?

Dr. Rosalyn Abbott is an Assistant Professor in Biomedical Engineering at CMU. Prof. Abbott received her B.S. and M.S. degrees in Biomedical Engineering from Rensselaer Polytechnic Institute and her Ph.D. degree in Bioengineering from the University of Vermont. She was subsequently a postdoctoral fellow in the Biomedical Engineering Department at Tufts University working under the supervision of Professor David Kaplan, where she developed adipose and skin tissue engineered models. Her lab at CMU focuses on using tissue engineering to study metabolic regulation during the complex transition of obesity to insulin resistant type II diabetes.

## **YOUR BRAIN'S SENSORY WORLD GRADES K-2**

February 16<sup>th</sup>

What you feel is based on the sensory input we receive from the world around us, which we experience through our eyes, ears, skin, nose, and tongue. In this course, students will explore these sensory organs and how they transform light, sound, and chemicals into your favorite food or song. We will model the specialized cells in your eyes, make simulation snot, map our tongues, compare the sensitivity of our fingertips to our toes, and why smells reach us from across the room. We will deepen their understanding of, and their appreciation for, the most complex organ in the body—the brain.

Dr. Meredyth Wegener is the instructor for this class. Please see her biography on page 4.

## Gelfand Outreach Spring 2019 Saturday Series Classes

*Classes are \$55.00 each and are conducted from 9:00AM to noon at Carnegie Mellon University.*

### **January 26<sup>th</sup>**

*Gr. K-2: You Are What You Eat  
Gr. K-2: Tiny Hard Working Guys  
Gr. 3-4: Architecture Without Walls  
Gr. 3-5: Stock Market  
Gr. 4-6: Eyes on the Universe  
Gr. 7-9: Wearable Computers*

### **February 16<sup>th</sup>**

*Gr. K-2: Owls: What a Hoot!  
Gr. K-2: Your Brain's Sensory World  
Gr. 3-4: Wedo Robotics  
Gr. 3-5: The Air We Breathe  
Gr. 4-6: Nanoengineering with DNA  
Gr. 5-7: Animations with the Wick Editor  
Gr.7-9: Drama in 3D*

### **March 23<sup>rd</sup>**

*Gr. K-2: Liquid Science  
Gr. 3-4: Architecture of Sound  
Gr. 3-5: Go Green!  
Gr. 4-6: Perceiving the World through Robot Sensors  
Gr. 5-7: Artificially Intelligent Chatbots  
Gr. 7-9: Making the Banana: Costuming & Processing 3D to 2D*

### **April 6<sup>th</sup>**

*Gr. K-2: Bug-bots  
Gr. K-2: Genes You're Always Wearing  
Gr. 3-4: Super Hero Science  
Gr. 4-6: Solar Energy  
Gr. 5-7: Artificially Intelligent Chatbots  
Gr. 5-7: Cameras and Displays  
Gr. 6-8: Worm Doctor: Genes & Diseases*

*To apply for scholarship funds, please submit a copy of the first page of your IRS 1040 tax form from 2017.*