Saturday GENE-ius Program
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Overview and Mission

Dr. Ania Wieczorek, a professor in the Department of Tropical Plant and Soil Sciences in the University of Hawaii-Mānoa College of Tropical Agriculture and Human Resources, has long observed that Hawaii’s teachers lacked the resources and time to teach science comprehensively in their classrooms. She saw an opportunity to augment what was being taught in Hawaii’s public and private schools during non-school hours.

Dr. Ania, as the students know her, decided to fill this void. She wanted young students to experience the wonder of science and to present science to them in a fresh, engaging manner that would be appealing to today’s generation of youngsters who are often preoccupied with electronic mobile devices and other distractions. She has created curricula that transport young students into new, imaginative worlds where they are immersed in criminal forensics and other roles involving science. The hands-on excitement rivals the best video games, and teaches children at the same time.

This special program helps to recapture the love of science and inspire the next generation to pursue different fields of science to address current and future global challenges, including climate change, feeding the world’s growing population, and finding commercially viable renewable energy sources. Reaching parents simultaneously would also provide an educational opportunity for adults, and contributes to enhancing the general public’s understanding of science.

Brief History and Future Aspirations

The program began with Gene-ius Day field trips, which continue today with elementary schools to the University of Hawaii-Mānoa campus every other week during the regular school year. This unique program allows students to explore and investigate science-related topics they would not normally have in their daily lives or classrooms in Hawaii. A total of 9,000 students have attended this program over the past six years.

The success of the Gene-ius Day field trip program led to the development of ‘Saturday GENE-iuses’ at University of Hawaii-Mānoa as a result of the increased need for hands-on science learning in Hawaii’s schools. In this program, students from grades one to eight attend Satur-
day classes to explore numerous topics including, genetics, botany, forensics, entomology, biotechnology, archeology, climatology and much more.

In its initial year, the Saturday Gene-iuses program welcomed 59 students attending all the classes through the school year, and in the 2015-2016 school year, the number of students in the program will expand significantly to accommodate 360 students. In the 2014-2015 school year alone, the program graduated 200 students from the first to eighth grades.

The Saturday Gene-iuses program will expand to include high school students in the summer of 2016. It is important to underscore that this will mark a major milestone of completing the full spectrum of students served, and provide a bridge that leads to college. This has always been one of Dr. Ania’s dreams: to create a comprehensive curriculum that is sequential and cumulative for students from elementary to high school.

Program Summary

The Saturday Gene-iuses program runs up to five, two-hour Saturday Gene-ius classes twice a month, with a new class/topic debuting each month. The STEM-based classes were developed to include exciting, hand-on activities that encourage scientific thinking and an appreciation for all things science related. For the 2015 to 2016 school year Saturday GENE-iuses will accommodate students in grades 1 to 8. Each class takes place in a laboratory setting and promises awesome science experiments and activities.

Elementary Program

Elementary age students (grades 1-6) will participate in nine different labs:

Lab 1 “DNA Detective”: After witnessing an unusual alien creature fail in his attempt to steal baby animals from the planet Yorb, it is their mission to find a way to match up each baby with the correct parent. How can you complete this task if the babies look nothing like
their parents? In MISSION 1, students will explore the amazing characteristics of DNA, build their own DNA model, and translate their name into a DNA sequence!

**Lab 2 “Plants to rescue”:** What if planet Earth had reached its maximum capacity and we were forced to move to the moon? Could human life persist without plants? Definitely not! In this class students will discover the incredible cells found in plants and what they do (hello microscopes!), build their own plant cell, observe how plants breathe by learning about photosynthesis, and find out just how valuable plants are in our every day life!

**Lab 3 “Buzz off”:** Did you know there are over one million types of insects living on our planet?! Did you know a cockroach can live for ONE WEEK without a head or that a flea can jump 130 times its own height? Insects are incredible creatures, some of which are very important to us while others can carry harmful diseases. In this class, students will learn about the beautiful body parts of insects and how to tell them all apart (just like scientists do!), build their very own insect model, and observe a live insect-plant relationship!

**Lab 4 “CSI for a day”:** Did you know Forensic Science is any science that can be used to help police solve a crime? We want you to help us solve a case by becoming a Crime Scene Investigator (CSI) for the day! In this class, students will use forensic science to learn about the types of evidence that can be collected at a crime scene and how to analyze them. They will also collect enormous fingerprints, sticky blood samples and alien hair strands to find our guilty suspect!

**Lab 5 “DNA extravaganza”:** What happens when you mix biology (the study of plants and animals) and technology (the making of tools and machinery) together? You get biotechnology! Scientists that work in biotechnology develop products that make our lives easier and genetic engineering is one of the tools they use. In this class, students will learn how scientists have used DNA and microscopic bacteria to make
things that we use everyday… for example, cheese and insulin!

Lab 6 “You are what you eat”: Does that mean I’m a peanut butter and jelly sandwich if that’s what I ate for lunch? Of course not, but what you eat does determine how healthy and strong you are! In this class, students will discover where their food and spices come from and the thousands of miles travelled before they make it into their belly! And, did you know fruits, vegetables and even their hands are covered in bacteria?! Some of these bacteria are good, while others can make you sick. In this class, you will perform experiments to see if you can actually wash bacteria off their hands and other experiments to see if you can find bacteria living on food we eat everyday.

Lab 7 “The dirt on dinosaurs”: Take a journey into Earth’s ancient past and discover the amazing world of dinosaurs! Become a palaeontologist for a day and examine real fossils, excavate a dinosaur skeleton, and make their own fossil to take home!

Lab 8 “Wonderful weather”: Our world is always changing, especially the weather! Learn about the Earth’s dynamic atmosphere and how it changes over time. Find out if students can make clouds and rainbows in the laboratory! Also, build their very own UV detector that changes color when outside!

Lab 9 “Find me if you can”: The world is full of crazy creatures! We will learn all about the ways in which they have adapted to their habitats with interactive games that are sure to make students laugh! Also, students will need to figure out how to survive on a planet made of goo!

Middle School Program

Middle school student’s (grades 7-8) will participate in nine different labs

Lab 1 “Crime in the 19th Century”: During the first class, students explore what life was like in the 1800’s. Then, they learn the details of a terrible crime that occurred during this period and become familiar with the victims, suspects and evidence collected.

Lab 2 “A Hair Raising Experience”: In this class, students learn how to analyze hair samples under the microscope, then compare and contrast their own hair type with their classmates. Now experts on hair sample analysis, they analyze hair samples collected at the crime scene and begin to narrow down their suspects.

Lab 3 “Please, No Vampires!”: This class allows students to explore the fascinating science behind human blood types. Here, they learn the importance of including controls in scientific experiments and analyze blood evidence from the crime scene.
Lab 4 “No Two are Alike!”: Fingerprint analysis is all about patterns. In this class, students learn to identify these patterns and analyze their own and their classmates fingerprints. Before they analyze crime scene evidence, students investigate and practice the careful art of dusting for latent, or invisible, prints.

Lab 5 “It’s a Bloody Mess!”: Bloodstain pattern analysis allows forensic scientists to recreate crime scene events. In this class, students create their own reference blood spatters to investigate the roles of impact and force on creating unique patterns. Now experts, students analyze actual evidence and consider what events took place at their own crime scene.

Lab 6 “DNA & Forensics”: Forensic DNA analysis is a powerful tool to accurately convict the guilty and exonerate the innocent. In this class, students examine their own cheek cells and DNA before moving on to explore the significance of using DNA analysis in forensics.

Lab 7 “One in a Billion?”: Having evaluated the importance of DNA in forensic investigations, students are ready to examine DNA evidence from their own crime scene. Based on their conclusions, students begin to construct a theory and discuss their findings with the class. In addition, students prepare shoe impressions to get a head start on the next class.

Lab 8 “Cover Your Tracks!”: Impressions left by shoes provide key evidence that can help solve a crime. Students examine their own shoe impressions to explore minute differences between footwear patterns. Now experts, they move on to inspect impressions left at the crime scene. Students finish this class with an introduction to pathology and review of autopsy reports.

Lab 9 “Who Dunnit?”: The data are in! It is time for students to compile the evidence and build their arguments. Will each group come to the same conclusion? Get ready to make your case for the Grande Finale!

The Saturday Gene-iuses team consists of 18 UH staff, graduate students, undergraduate students, and high school interns. This science-loving team collaborates to make each class fun, interesting and engaging for every one of their students. The result is a group of young scientists leaving the classroom excited about science! It is a common occurrence that a student at
the end of class says: “I want to be a scientist when I grow up!” Parents who participate in Saturday Gene-ius program are equally, if not more, enthusiastic about science than their children, and also give the program a thumbs up.

Registration Information

The Saturday Gene-ius Program registration is currently open for the 2015 to 2016 school year for students in grades one to eight. For more information about how to register visit http://www.ctahr.hawaii.edu/geneius-day/saturdaygeneiuses.html