Academy Workshops

Summer 2017

MIDDLE & HIGH SCHOOL

Workshops for middle school and high school students will be held separately—with course material designed for each level.

NEW! MAKE YOUR OWN INFLATABLES

Explore the fascinating world of bubbles! Discover the intersection of engineering, architecture, art and nature through amazing experiments with bubbles and inflatables. As inventors and designers, we will be building our own unique constructions through the iterative design-to-build process and creating giant inflatables from ordinary plastic bags! No experience required.

NEW! SCIENCE OF SCIENCE FICTION

Join us in blending knowledge with creativity to construct rich, innovative science fiction stories. We explore how classic works of science fiction—from literature to film—found their beginnings in scientific thought. Using craft elements of fiction writing, students write their own science fiction stories and, just maybe, influence the science world! No prior experience necessary.

NEW! INTRODUCTION TO CIRCUITS USING MAKEY-MAKEY

Do electronics and bananas go together? Absolutely! Learn how to create fun circuits using Makey-Makey circuit boards that can be expanded and accentuated with everyday items like a gummy bear, tin foil or a bouncy ball. Science and art will collide as the technology of circuits is used to create art in the form of music, paintings and games.

NEW! VIRTUAL REALITY WITH GOOGLE CARDBOARD

Join the Virtual Reality technology movement that simulates experiences (like going on a roller coaster) using Google Cardboard* (a Virtual Reality viewer). Work in groups to create your own virtual reality interactive tools and games and learn basic concepts of stereoscopy. Gain experience in C# programming and 3D modeling, and learn how to use the popular UNITY game engine. No prior experience with computer programming or 3D modeling is required.

* Google Cardboard: https://www.google.com/get/cardboard/

ENROLL TODAY!

MIDDLE SCHOOL

MESSY SCIENCE

Boom, crash, zip, slide! Participate in hands-on learning activities that let you design things, throw things, test things and STOMP on things. Learn about the scientific processes behind volcanoes, earthquakes, tsunamis, landslides, permafrost, glaciers and sea level rise while adding your own artistic flair to each design.

MUSIC OF EARTHQUAKES

Explore the interplay between music and earthquakes. Work in groups to compose a zany musical representation of a seismogram (a data recording of an earthquake) using musical instruments of your choice—anything from a simple bell to a floor-mat piano. Use the Audacity audio/visual software to explore and understand the frequency content of different types of music (rap, hip-hop, soul, contemporary, classical) and different types of earthquake data. Create guitar-pick necklaces and other musical crafts to take home. No prior experience required.

HIGH SCHOOL

NEW! ETHICALLY HACKING TOYS

In this computer tech class students transform toys into things the manufacturer never intended. Learn how to create fun circuits using Makey Makey circuit boards, and use this knowledge to hack into electronic toys like remote controlled cars, walking dinosaurs, toy pianos, LED panels and more. Students will learn basic circuits concepts and work in teams to modify the functionality of various electronic devices. Students will also create ethical hacking tools to help them accomplish their target objectives for their final project.

NEW! CULINARY CHEMISTRY & DESIGN

Fun with Flavors: In this science of cooking class, together we learn how cooking is, at its base, not just about knowing how to follow a recipe, but ultimately about creative expression. We experiment to figure out if the old "taste bud map" is real or a myth, and learn about food from different cultures. Using a recipe journal, students jot down notes, established recipes and their own recipe ideas. On the last day, we create a giant masterpiece (using vegetables, fruit and cupcakes) decorated and creatively assembled by our culinary crew. Having an inspired junior chef in the house is priceless. For safety reasons, no open flame will be used in this class. No prior experience is necessary.

NEW! PIRATE SCIENCE

Ahoy! Life as a pirate is rough and rugged and it requires scientific ingenuity. Join us to learn the fundamental suite of traditional nautical arts. Students will learn the elements of celestial navigation, sword fighting, weather prediction, knot tying, ship construction and sailing. The course fosters an appreciation and understanding for the bravery and ingenuity of traditional sailors as well as the beauty and elegance of modern physical theory.

NEW! GAME STUDIO

After identifying a role that suits their passions and talents—be it artist, sound engineer and/or programmer—students form collaborative groups, or "Game Studios." Artists are responsible for developing 3D models, graphics and animations. Sound engineers create audio effects. Programmers integrate these pieces into a final game product. Tools including Gimp, Audacity and intermediate-level C# language and the Unity game engine will be used. Built into the class is learning the importance of project management, time allocation, and how to establish realistic benchmark goals and timelines. Note: To take this course, students must have completed either Introduction to Programming and/or Introduction to 3D Modeling courses or have prior consent from the instructor.

SPACE OUT

Buckle your seatbelts and get ready to blast off as you plan your own mission to space! Students design and build their own miniature spacecraft, which will be presented and launched on the last day of class at the "rocket launch" celebration. Explore our Earth and then expand to other planets, solar systems and faraway galaxies. Join us to learn about past and current space missions, different kinds of stars, habitable planets, black holes and even a little relativity.

SLIMY SEA CREATURES

Learn about slimy sea creatures like octopuses, sea stars, sand dollars and moon snails, to name a few. Observe a squid dissection and write your name in squid-ink while learning about anatomical structures of sea creatures. Discover the secret of how octopuses change color and what makes pearls. Become a marine biologist and investigate what kind of invertebrate you would like to be! Create artwork to take home using different types of seashells and other materials found in nature.

INTRODUCTION TO ROBOTICS WITH LEGO MINDSTORMS EV3

Learn basic concepts of robotics and then build robots using the LEGO MINDSTORMS EV3 kit while using basic flowchart programming to create autonomous robots. Working in groups, compete in science instrument deployment competitions using multiple sensors on the robots. No prior experience with robotics or programming is required.

A TREASURE CHEST OF EXPERIENCES – DEEP SEA EXPLORATION

Get a deep sea look into the bizarre creatures that dwell in the abyss and beyond, from the Dumbo Octopus to the newly discovered Ninja Lanternshark. Explorers have the opportunity to virtually pilot an underwater vehicle using the Scripps Institution of Oceanography DEEP XBOX game and learn firsthand about expeditions in the deep sea. From dive suits to landers and submarines, pressure/density relationships are illuminated to show what makes research in these realms so challenging. Learning comes to life as each student creates their own treasure chest multimedia box to bring home their handcrafted creatures inspired from the deep.

INTRODUCTION TO DIGITAL 3D MODELING USING MAYA

How do you create amazing digital movie environments, realistic looking objects in video games, and cool 3D graphics for TV commercials? The power of 3D visual effects surrounds us. Learn how this popular 3D form of art is interspersed in our lives and how 3D modeling can be used beyond the entertainment industry. Join us to explore 3D computer modeling, texturing, character rigging, animation and rendering using Maya. Create your own 3D models that will be included in either a course compilation movie or imported into a videogame as a 3D asset. No prior experience with programming is required.

INTRODUCTION TO VIDEO GAME PROGRAMMING WITH UNITY

What better way to learn introductory concepts of computer science than within a video game environment powered by the popular Unity game engine as a visualization tool! Using the C# scripting language, learn code structure and syntax, conditional statements, loops, functions and data structure, and write and run simple scripts. After learning how to handle user input, object collision and interface design, create your own simple video game!

NEW! ARCTIC MAMMALS: BIOLOGY, CULTURE & ART

Learn about mammals that call the Arctic Ocean home, including narwhals, belugas and walrus that thrive in this harsh and ever-changing climate. We eavesdrop on several Arctic ecosystems, learning about "soundscapes," or acoustics, and the role sound plays in the communication of marine animals. Art brings lessons to life as students take clay sculpting and mixed media creativity to the next level. Each animal we learn about is sculpted out of clay, and together we create an art display of the Arctic ice-flow ecosystem.

NEW! ART OF ANATOMY

In this class, we learn about 11 body systems that work together to keep us alive. We look at how the organs in each system range in size, shape and weight. We explore and learn! Why is our skin our largest organ? Are our lungs the only organ that can float on water? And is one of our kidneys the size of a kidney bean? To better understand our anatomy and physiology, students create life-size models and artistically construct 3D models to demonstrate some of our body processes. No prior anatomy experience is required.

NEW! MATH OF MURALS

Design a mural while simultaneously discovering how to use math to perfect the execution of the final project. Explore how different types of paints adhere to different surface types, and become efficient at calculating the needed materials and costs to complete large-scale murals. Together we will investigate obtaining permission and permits for final mural placement. Topics will also include a discussion of funding and grants and how to use technology to enhance designs. All students will participate in creating a sample mural, either individually or in groups.

Contact: 858-534-0804 and srs@ucsd.edu

Junior Academy Schedule at a Glance

The Sally Ride Science Junior Academy for Girls offers fascinating and fun learning experiences in science, technology, engineering, arts and math (STEAM) for girls entering grades 6-12 in 2017-2018.

GRADE	CLASS	JUNE 26-30	JULY 3-7	JULY 10-14	JULY 17-21
MIDDLE SCHOOL	NEW! Make Your Own Inflatables	▲			
	NEW! Science of Science Fiction	● ▲		●	▲
	NEW! Introduction to Circuits Using Makey-Makey	●		▲	▲
	NEW! Virtual Reality with Google Cardboard			●	
	Messy Science	● ▲		● ▲	● ▲
	Music of Earthquakes	▲		▲	▲
	Space Out	●	■	▲	●
	Slimy Sea Creatures	● ▲	■	▲	● ▲
	Introduction to Robotics with LEGO MINDSTORMS EV3	●			▲
	A Treasure Chest of Experiences – Deep Sea Exploration	▲	■		
HIGH SCHOOL	NEW! Make Your Own Inflatables	●	■		
	NEW! Science of Science Fiction		■	▲	●
	Introduction to Circuits Using Makey-Makey				●
	Virtual Reality with Google Cardboard	▲		▲	
	NEW! Ethically Hacking Toys		■		
	NEW! Culinary Chemistry & Design	●		▲	●
	NEW! Pirate Science			● ▲	● ▲
	NEW! Game Studio		■		●
	Introduction to Digital 3D Modeling Using Maya	▲		●	▲
	Introduction to Video Game Programming with Unity	●		▲	
	NEW! Arctic Mammals: Biology, Culture & Art			●	▲
	NEW! Art of Anatomy	▲	■	●	
	NEW! Math of Murals			▲	

● Morning sessions: 9-noon ▲ Afternoon sessions: 1-4PM ■ July 3-7: 9AM – 2PM with an hour for lunch

JUNIOR ACADEMY
for Middle and High School Girls
SUMMER STEAM WORKSHOPS

June 26-July 21, 2017

1-week courses // half-day classes // $150 per course
Morning sessions: 9-noon // Afternoon sessions: 1-4PM // July 4 week: 9AM-2PM

During these workshops, students assume the roles of space explorer, ocean engineer or computer scientist as they immerse themselves in hands-on projects. Top-notch STEAM instructors lead these workshops, serving as both teachers and role models. The workshops also incorporate real-life stories of vibrant women conducting research in each field. Their examples inspire students and help make STEAM careers more accessible.

Classes will be held at Mission Bay High School: 2475 Grand Ave., San Diego, CA 92109
sallyridescience.com // 858-534-0804 // srs@ucsd.edu

REGISTER TODAY!
sallyridescience.com

SRS SALLY RIDE SCIENCE @ UC SAN DIEGO

JUNIOR ACADEMY

Summer STEAM Workshops for Middle & High School Girls

June 26-July 21, 2017

www.sallyridescience.com

SALLY RIDE SCIENCE
@ UC SAN DIEGO

Junior Academy

SUMMER STEAM WORKSHOPS FOR MIDDLE & HIGH SCHOOL GIRLS

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www.sallyridescience.com