'IMILOA
Astronomy Center of Hawai'i

Educational Highlights
March-April, 2009

K-12 Student Field Trips

Date	School / Youth Group	Location	Grades	Student #
3-3-09	Moore Grant/Waiakea Elementary School	Hilo	1	157
3-4-09	Moore Grant/E.B. DeSilva Elementary School	Hilo	1 + 2	98
3-4-09	Moore Grant/Laupahoehoe Elementary School	Laupahoehoe	1 + 2	35
3-4-09	Moore Grant/Waiamea Country School	Waimea	2-6	22
3-5-09	Moore Grant/Hawaii Preparatory Academy	Waimea	1 + 2	40
3-5-09	Moore Grant/St. Joseph Elementary School	Hilo	1 + 2	29
3-5-09	Moore Grant/Hilo Union Elementary School	Hilo	2	70
3-8-09	Sacred Hearts Academy	Honolulu	12	14
3-11-09	Moore Grant/Hawaii Academy of Arts and Science School	Pahoa	1 + 2	37
3-11-09	Moore Grant/Mauna Loa School	Hilo	1 + 2	11
3-12-09	Christian Academy	Haleiwa	mixed	27
3-12-09	Sacred Hearts Academy	Honolulu	4	37
3-12-09	Moore Grant/West Hawaii Exploration Academy	Kailua Kona	5 + 6	21
3-12-09	Laie Elementary	Laie	4	73
3-13-09	Moore Grant/Chiefess Kapiolani School	Hilo	1	55
3-13-09	Moore Grant/Ha'aheo Elementary School	Hilo	1 + 2	41
3-13-09	Ke Kula O Nawahiokalani'opu'u School	Keaau	9 - 12	10
3-20-09	Ke Kula O Nawahiokalani'opu'u School	Keaau	9 - 12	10
3-20-09	Makalapa Elementary	Honolulu	5 + 6	77
3-26-09	Kilohana Elementary	Kaunakakai	6	5
			March Total	**869**
4-2-09	Kapaa High School	Kapaa	9	4
4-2-09	Aloha Angels 4-H Club	Kailua Kona	mixed	12
4-3-09	Our Savior Lutheran School	Aiea	mixed	14
4-3-09	Holy Family Catholic Academy	Honolulu	mixed	54
4-7-09	Moore Grant/Honaunau Elementary	Captain Cook	5	17
4-7-09	Moore Grant/Haili Christian School	Hilo	5 + 6	18
4-8-09	Pahala Pre-School	Pahala	Pre	25
4-10-09	Ke Kula O Nawahiokalani'opu'u School	Keaau	9 - 12	10
4-14-09	Ke Kula O Nawahiokalani'opu'u School	Keaau	9 -12	10
4-15-09	Ke Kula O Nawahiokalani'opu'u School	Keaau	9 - 12	10
4-16-09	Konawaena High School	Kealakekua	9 - 12	40
4-17-09	Hawaii Academy of Arts and Science	Pahoa	7 + 8	25
4-21-09	Moore Grant/Kalanianaole School	Hilo	5 + 6	59
4-21-09	Moore Grant/Connections Public Charter School	Hilo	5 + 6	54
4-21-09	Moore Grant/ Hualalai Academy	Kailua Kona	5 + 6	32
4-22-09	Hokulani Elementary	Honolulu	4	48
4-22-09	Hongwanji Mission School	Honolulu	4	24
4-22-09	St. John Vienny School	Kailua	4	27
4-22-09	Moore Grant/ Kona Christian Academy	Kailua Kona	5 + 6	15
4-23-09	Moore Grant/Kahakai Elementary School	Kailua Kona	5	100
4-23-09	Star of the North Secondary School	North Pole, Alaska	8	10
4-23-09	Ke Kula O Nawahiokalani'opu'u School	Keaau	9 - 12	27
4-24-09	Lelihoku Elementary	Waianae	6	73

4-24-09	Ke Kula O Nawahiokalani'opu'u School	Keaau	9 - 12	10
4-24-09	The Colby School	Park City, Utah	mixed	13
4-28-09	Moore Grant/Kaumana Elementary School	Hilo	5 + 6	67
4-28-09	Moore Grant/Holualoa School	Holualoa	5	66
4-29-09	Moanalua Middle School	Honolulu	6-8	104
4-30-09	Moore Grant/Keaau Elementary School	Keaau	5	140
			April Total	**1108**

K-12 Student Programs

Gordon & Betty Moore Grant Field Trips:

During the months of March and April the 1st and 2nd grade Moore Grant field trips were finally wrapped up and we continued with the 5th and 6th grade theme of The Reason for the Seasons.

Ka Umeke School follows Hawaiian protocol by chanting a traditional request to enter a place of learning.

The gardens are experienced as an exhibit highlighting Polynesian-introduced plants.

Students line up to enter the planetarium.

Ready for the show!

Science Rocks! After School Program:

A total of 7 different Science Rocks! After School sessions were offered during March and April covering the themes below:

Inventions: Boats, Land Vehicles, Mag Lev, Hovercraft
Energy House
Slime & Polymer Chemistry
Space Science
Human Body
Combustions & Explosions
Science of Cool

How things go was the focus of the Inventions session in which students built 4 different vehicles experimenting with paddle wheels, motors, magnetic levitation and wind power as well as air pressure to lift a hovercraft vehicle above ground surface allowing it to skim along with very little friction.

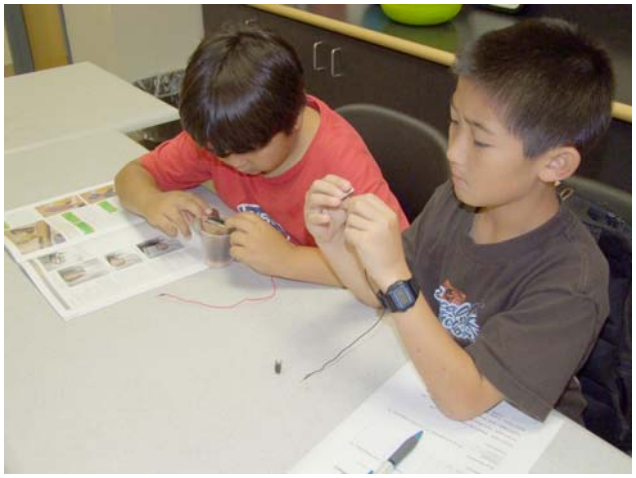
Students begin by working with the Inventions in Boats kit…

Make sure to start the race BEHIND the starting line!

A high-powered fan provides wind power to propel a mag-vev vehicle with a student-designed sail

In the Energy House session model homes were used to explore ways we can be more sustainable and use less energy to lead high quality lives. Capturing sunlight to heat a home or designing a home to be efficiently cooled by breezes, heating water with sunlight, solar collectors and solar electricity, baking food with the sun, refrigeration, and sustainable fuels are all topics for experimenting and learning how to live better with less impact on planet Earth.

These Styrofoam models of energy efficient homes help students comprehend the scientific principles involved with their eyes, hands, and minds. They are constructed so thermometers can be inserted into various parts of the home such as the living room, greenhouse, etc. Students can even construct a model refrigeration unit to understand how refrigerators work as well as how to cool a home with air conditioning.

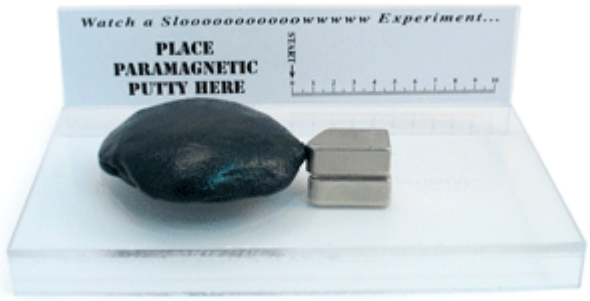


These two boys are constructing a lemon battery using copper and zinc plates + lemon juice. Energy collected from the sun must be stored in batteries to be used later on demand.

These working solar ovens can cook rice, toast, hot dogs, apples, potatoes, etc. as long as there is sufficient sunshine. Students experiment to find the hottest part of the oven learning about the focal point of the Sun's rays in this Earth-friendly cooking device.

Students pick up their solar ovens to begin their individual experiments.
The lights are our artificial Sun…

All kids love slime!!! In our Slime and Polymer Chemistry session students do slimy things like watch black ferromagnetic putty move towards a strong magnet, make worm-like gel strands, investigate the hydrophilic and hydrophobic properties of substances such as water gel crystals and Instant Snow Polymer (dry materials that absorb and retain large amounts of water) and Magic Sand (sand that does not absorb water at all, remaining dry underwater). In this way students learn basic acid/base chemistry and explore the world of polymers which are so prevalent in our modern day lives: from plastics, to farming, to diapers, and out into space!



Ferromagntic Putty moves towards a magnet

Make polymer worms…

Water gel crystal after they absorbed water…

Instant Snow goes from a little to a lot!
Just add water!

Sand that does NOT get wet! WOW!

GET SLIME!

In our Space Science session students use their observational skills to simulate and compare observations of solar system objects such as planets from Earth-based observatories, fly-bys, orbital satellites, and robotic landers on the surface. They also observe a virtual orbit and launch simulator and learn what it is like to live in space on the International Space Station. Special attention is given to making connections between technologies developed for the space program and everyday technologies we use here on Earth that are a direct result of that research and development.

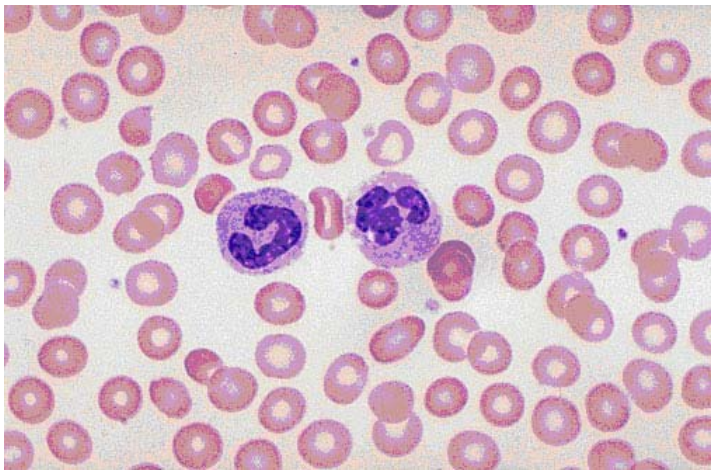
After simulating fly-bys and orbits of their planets, students simulate robotic landing observations using jeweler's loupes for close-up features.

Students learn about the amazing human body in this Science Rocks session. Bones are examined via X-rays of human bones, both broken and intact, and comparisons are made between human bones and animal bones. The Eye Brain Connection, senses, and blood and blood typing activities touch on some of the interesting facets of our bodies. Students make a cell model out of Shrinky Dink material (a material that hardens and shrinks when baked) which they can use as a key chain on their backpacks. And of course, it is always fun to listen to your own heart beating!

Hmmmm…the leg bone's connected to…

I hear it!

Bake at 350 degrees for 3 ½ minutes…



Human blood smear with red and white blood cells.

Combustions and Explosions is the Science Rocks session in which we do most of our basic chemistry concepts. The Periodic Table of the Elements is introduced and students take home a heat sensitive Periodic Table that changes color when exposed to different heat, such as your hand. Patterns in the Periodic Table of the Elements are emphasized and the scientific process of thinking in patterns. Students also use diffraction glasses to look at glowing tubes of different elemental gasses, such as hydrogen, helium, mercury, etc. They can observe the different spectral line patterns of the elements and learn how astronomers use this knowledge to observe stars such as our Sun and determine which elements are present in those celestial bodies. The pH of different substances is explored using red cabbage solution and observing color changes. The science behind fireworks is explored by burning different elements in a flame to observe the colors produced, just as they are in the fireworks we see in the sky. The session ends with students using Zome Tools to build models of different molecules.

Add two drops red cabbage solution and watch for the color change to determine pH.

Below is helium gas as seen through diffraction grating glasses. Ranjani and Gail burn the same elements used in fireworks. Students build molecular models. Remember, no job is complete until the paperwork is done!

In the Science of Cool session we do some really COOOOOOL experiments with liquid nitrogen and dry ice. Many experiments were done freezing various things such as a flower, a balloon, cheese puffs, a banana, and a tennis ball. The liquid nitrogen is placed into a tea kettle to demonstrate its low boiling point (no heat needed). We even fry an egg in liquid nitrogen and make yummy strawberry ice cream to eat. With the dry ice, we make metal "scream", dissolve dry ice in water and add detergent to see a very long column of bubbles, and make bubbles float on the carbon dioxide gas generated just above the dry ice.

Freezing a tomato and a banana with liquid nitrogen, pounding a nail with a frozen banana, and using dry ice to perform the milk bottle experiment. Way Cool!

Family Programs

`Imiloa's Third Birthday Bash:

`Imiloa Astronomy Center celebrated its third year of operation with a free community day on Sunday, March 1, 2009 from 9 a.m. to 4 p.m.. In addition to free access to planetarium shows and the exhibit hall, guests were treated to hands-on activities, space quiz shows, and the chance to operate a moon rover in a simulated lunar environment. Poi pounding and kalo presentations, as well as guided landscape tours, took the celebration outdoors on a beautiful day. NASA's Brian Day presented a talk: "Return to the Moon" using new programming on the center's Science on a Sphere. A panel of three experts from NASA also held a panel discussion of the upcoming Lunar Crater Observation and Sensing Satellite (LCROSS) mission. In the afternoon the Hawaiian Lexicon Committee, consisting of 3 instructors from UH-Hilo, presented "Exploring Hawaiian Language." This was a discussion of their work developing new terms for `Imiloa exhibits. Three sessions were offered: History Revitalization, Creation of New Terms, and The Hawaiian Moon Calendar.

The remote-controlled moon rovers were a BIG hit with the younger set.


The public fills `Imiloa's atrium…


A visitor assembles one of the many puzzles available throughout the center.


This family looks through the viewmasters at 3D slides of the LRO/LCROSS mission


Brian Day delivers his talk: "Return to the Moon" on the Science on a Sphere

Between the yummy bentos and snacks provided by the Sky Garden Restaurant, and the freshly pounded poi harvested from `Imiloa's own gardens, there was NO SHORTAGE of `ono grinds available on site for our Birthday celebration!

Collaborations

Festival of Science:

On March 12, 2009 Bishop Museum brought their HoloHolo Science Program to `Imiloa for a special FREE evening event for families called the Festival of Science. The event took place in our Moanahoku Hall from 2:30 p.m. until 7:00 p.m.

The HoloHolo Science van from Bishop Museum arrives at `Imiloa. After unpacking, Leon instructs our volunteers in how to interact with the public in each of the different activities.

Heart Rate is the activity at right…

Pictured above is the Choosing Food activity and the Remote Sensing exploration. Pictured below is Dig This! and also the testing pH activity.