

## Keep Exploring Math and Science!



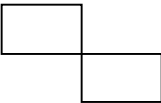
Now that you've been to GEMS, we know you will be looking for ways to keep exploring math and science! Here are some cool ideas for you. You may want to ask your teacher for extra credit for completing one of these projects, reading one of the suggested books or magazines, or visiting one of these Big Island sites with your family. Have fun!



### Cool GEMS Project Ideas

1. Make a collage of pictures and words about one of the careers you learned about at GEMS. You can print out images from a computer, cut them out from magazines, or draw or paint them yourself.
2. **Connect to Workshop 1, The Science of Fitness:** Show your family how waist circumference (the distance around your waist) can help to show how healthy you are. Use a tape measure and wrap around your waist at the level of your piko (belly button). Men should be less than 40 inches and women should be less than 36 inches for optimal (best) health.
3. **Connect to Workshop 3, In the Wake of Our Ancestors:** Think about the "voyage" of your life. How do you think the knowledge you gained at GEMS can help you reach your destination? Write a reflection on your experience explaining how math and science can help your "canoe" sail a smoother route.
4. Become a reporter and interview the girls from your school who attended GEMS about the experience. Use a video camera or tape recorder to record your conversations, then create a "TV" or "radio" show from your tapes and play it for your class.
5. **Connect to Workshop 4, Coral Reef Critters:** Try one of these activities to further explore the mysteries of sand:
  - ❖ Start a class or personal "sand bank." As you or your friends and relatives travel, bring back samples of sand to deposit into the collection. Show the location that the sand was collected from on a large chart or map of the world.
  - ❖ Collect sand samples from beaches around our island. Draw a large picture of the Big Island and place the appropriate sample at each location on the picture.
  - ❖ Research and write a report on the economic importance of sand. How valuable are sandy beaches to people in real estate and tourism communities? How is sand used in making products such as glass, crystal, or cement?
6. Start a GEMS club with other girls who attended the program. Find math and science project ideas from library books, or ask your teachers for ideas. Work as a team to conduct experiments and investigations.

7. **Connect to Workshop 5, Elements of Design:** Draw a floor plan of your room at home showing all doors and windows and major pieces of furniture. Using the techniques used in the workshop, diagram how air moves through your room. Based on this new understanding, assess if your current room layout should be left as is, or should be redesigned.
  
8. **Connect to Workshop 6, Cosmetics and Kitchen Chemistry:** Conduct a taste test with a friend. One person should close her eyes and hold her nose while the other feeds her a lifesaver candy, without telling what the flavor is. The taster should try to guess what flavor the lifesaver is, without letting go of her nose. Observations should proceed for a minute or so as the candy dissolves in her mouth. Is there any change in the taste of the candy from the beginning to the end of the experiment? Describe the tastes. What's going on? Approximately 80-90% of what we perceive as "taste" actually is due to the sense of smell. At first the taster may not be able to tell the specific flavor of the candy, just perhaps a sensation of sweetness or sourness. If she is patient, she may notice that as the candy dissolves she can identify the specific taste. This is because some scent molecules volatilize and travel up to the olfactory organ through a "back door" - that is, up a passage at the back of the throat and to the nose. It is actually smell that lets us experience the complex, mouth watering flavors we associate with our favorite foods.
  
9. **Connect to Workshop 7, Helping Hands:** If you became an occupational therapist, your job would be to help people with disabilities to overcome obstacles. Part of learning how to do this is to think about what things would be difficult to manage with different disabilities. Try out some of these ideas to help you see and feel what it is like to live with a disability:
  1. Wear sunglasses with wax paper over the eyes and try to walk around in your room or living room.
    - ❖ If your room is messy, how hard is it to be able to walk without stepping on something or running into something?
    - ❖ Count how many steps you take to get to the bathroom from your room.
    - ❖ If someone rearranges the furniture, how difficult is it to walk around the living room?
    - ❖ Try counting money without looking at it. How can you tell a one dollar bill from a five dollar bill? What would you do to be able to tell the difference if you couldn't see?
  
  2. Put two chairs next to each other at a 90-degree angle, like this:
 



    - ❖ Try sitting in one chair and then transferring yourself to the other without using your legs.
    - ❖ Try dressing yourself without standing or using your legs.
    - ❖ How difficult is it to dress and transfer with only your arms?
    - ❖ If you were in a wheelchair, you would have to push yourself everywhere with your arms. How tired would your arms get? How would you get up and down curbs? How would you get in and out of a car?
  
  3. Try eating and writing with your non-dominant hand.
    - ❖ How difficult is it to learn how to use your other hand?
    - ❖ Try dressing using only your non-dominant hand. How about tying shoes and buttoning buttons?
    - ❖ What other difficulties would you have if you could only use one arm?
  
  4. What are some other difficulties you can think of that you would have to overcome if you had a disability?

10. Give a short presentation about GEMS to a group of the students at your school who did not attend, such as the boys in your class, a fourth-grade class, or others. Tell about the workshops you attended and what you learned. Show the things you made and explain them.
11. **Connect to Workshop 8, Creative Computer Programming:** “Think like a computer” and write a flow chart to describe how to accomplish an everyday task, such as setting the table for dinner. Remember to be very specific in your instructions and include every detail – computers can only do what we program them to do.
12. **Connect to Workshop 9, the Art and Science of Food:** Find a healthy recipe from a cookbook or another source. Convert the recipe to make bigger or smaller servings depending on how many people you will cook it for. (For example, if the recipe serves 4 and you will be cooking for 8 people, multiply all the ingredient amounts by 2 to get the correct amounts. If you will be cooking for 2 people, divide the original amounts by 2.) Prepare the recipe with the help of an adult family member or friend, and enjoy!
13. Write a letter to the woman who conducted your favorite GEMS workshop. (You can find her name on your program.) Tell her why you enjoyed her workshop and what you learned from it. Send your letter by e-mail to [gems@aauwkona.org](mailto:gems@aauwkona.org), or by U.S. Mail to AAUW – GEMS, P.O. Box 390487, Keauhou, HI 96739.
14. **Connect to Workshop 10, Underwater Adventure:** Take a snorkeling trip to your favorite local beach with an adult family member or friend. Bring along a drawing pad and colored pencils, and draw some of the creatures you see underwater.
15. **Connect to Workshop 12, Reach for the Stars:** Record the phases of the Moon over a period of at least one month. First figure out where North, South, East and West are located wherever you will be standing to make your observations, such as in your backyard or on the beach. Use a compass to locate the directions. When you see the Moon, record where in the sky it was, whether closer to the East or the West, and what time you saw it. Make drawings of the phases of the Moon as you observe them (crescent, first quarter, full, third quarter, gibbous), or take photos of them. Using your observations, try to answer the following questions:
  - ❖ Can you see the Moon during the night only?
  - ❖ From which direction does the Moon rise?
  - ❖ Does the Moon rise at the same time every day?
  - ❖ What is your favorite phase, and why?
16. Think about what you ate for breakfast today. Use the handout you were given at the “Hit a Home Run for Nutrition” breakfast to check its nutritional value. How could you make your breakfast more healthy? Using the handout, plan a more nutritious breakfast to eat tomorrow, and ask an adult family member to help you prepare it.
17. **Connect to Workshop 14, e-Jewelry: Electrifying Fashion:** Take your GEMS Flasher pin off of your clothing and turn it on or off by opening or closing the pin. Show it to your friends and family. Ask them the same question we asked you: “how can you make it change state without taking the battery out?” (“Change state” means turn on or off.) Don't *tell* them the answer; see if you can give them hints so they can figure it out themselves. Once they figure it out, show them how the pin is a switch in the circuit. The flasher is a little circuit board. Where else can you find circuit boards? Where are they in your house? Where are they in your school?

18. **Connect to Workshop 17, Dig Into the Past:** Volunteer to join State Parks archaeologists or State Parks rangers to beautify our parks or help in the preservation of fragile cultural resources. You might help eliminate coral graffiti in the parks, or help with litter removal among archaeological sites.
19. Conduct a poll of the girls from your school who attended GEMS. Ask them three or four multiple choice questions about the program, for example: "Did GEMS make you more interested in math and/or science?" (Possible Answers: very much, somewhat, or not at all). Then for each question, calculate the percentage of girls who gave each of the possible answers. Write up your report and share it with your math teacher.



## Cool Math And Science Books & Magazines

**Books** - Check these out at your public library, school library, and the local or on-line bookstore.

- ❖ **Beyond Jupiter: The Story of Planetary Astronomer Heidi Hammel (Women's Adventures in Science)**, Alfred B. Bortz, Fred Bortz, Heidi Hammel
- ❖ **Black Stars**, Otha Richard Sullivan
- ❖ **Bone Detective: The Story of Forensic Anthropologist Diane France (Women's Adventures in Science)**, Lorraine Jean Hopping
- ❖ **Dr. Fred's Weather Watch**, Alfred B. Bortz
- ❖ **Forecast Earth: The Story of Climate Scientist Inez Fung (Women's Adventures in Science)**, Renee Skelton
- ❖ **Gene Hunter: The Story Of Neuropsychologist Nancy Wexler (Women's Adventures in Science)**, Adele Glimm
- ❖ **Girls Think of Everything: Stories of Ingenious Inventions by Women**, Catherine Thimmesh
- ❖ **Girls Who Looked Under Rocks: The Lives of Six Pioneering Naturalists**, Jeannine Atkins
- ❖ **Gorilla Mountain: The Story of Wildlife Biologist Amy Vedder (Women's Adventures in Science)**, Rene Ebersole, Amy Vedder
- ❖ **How to Encourage Girls in Math & Science**, Joan Skolnick
- ❖ **Magic Tree House Series**, Mary Pope Osborne & Sal Murdocca
- ❖ **The Math Book for Girls and Other Beings Who Count**, Valerie Wyatt
- ❖ **Math Doesn't Suck**, Danica McKellar
- ❖ **Nature's Machines: The Story of Biomechanist Mimi Koehl (Women's Adventures in Science)**, Deborah Parks, Mimi Koehl
- ❖ **Robo World: The Story of Robot Designer Cynthia Breazeal**, J.D. Brown

- ❖ **The Science Book for Girls: and Other Intelligent Beings (Books for Girls)**, Valerie Wyatt
- ❖ **Science Series** by Janice VanCleave
- ❖ **The Sky's The Limit: Stories of Discovery by Women and Girls**, Catherine Thimmesh
- ❖ **Space Rocks: The Story of Planetary Geologist Adriana Ocampo (Women's Adventures in Science, Joseph Henry Press)**, Lorraine Jean Hopping
- ❖ **Strong Force: The Story of Physicist Shirley Ann Jackson (Women's Adventures in Science)**, Diane O'Connell
- ❖ **The Technology Book for Girls and Other Advanced Beings (Books for Girls)**, Trudee Romanek
- ❖ **The Ultimate Girls' Guide to Science: From Backyard Experiments to Winning the Nobel Prize!** Beth Caldwell Hoyt, Erica Ritter
- ❖ **Women at the Edge of Discovery: 40 True Science Adventures**, Kendall Haven
- ❖ **Young Women of Achievement**, Frances A. Karnes, Kristen R. Stephens

**Magazines** - Check these out at your school or public library, or online.

- ❖ **Cricket Publishing magazines for kids:** [www.cricketmag.com](http://www.cricketmag.com)
- ❖ **Dig: the Archaeology Magazine for Kids:** [www.digonsite.com](http://www.digonsite.com)
- ❖ **Odyssey: Adventures in Science:** [www.odysseymagazine.com](http://www.odysseymagazine.com)
- ❖ **Weekly Reader/WR Science:** [www.weeklyreader.com](http://www.weeklyreader.com)
- ❖ **Zoobooks Magazine:** [www.zoobooks.com](http://www.zoobooks.com)



## Cool Big Island Activities for Families

### **Amy B.H. Greenwell Ethnobotanical Garden:**

[www.bishopmuseum.org/exhibits/greenwell/greenwell.html](http://www.bishopmuseum.org/exhibits/greenwell/greenwell.html)

Visit the 15-acre garden in Captain Cook which showcases 250 types of plants that nourished early Hawaiians and treated their ailments.

### **Astronaut Ellison S. Onizuka Space Center:**

[http://www.hawaiimuseums.org/mc/ishawaii\\_astronaut.htm](http://www.hawaiimuseums.org/mc/ishawaii_astronaut.htm)

Discover this excellent educational facility with fun, interactive space related exhibits, films, lunar rocks and an Apollo 13 space suit.

### **Day at the Beach:** <http://www.letsgo-hawaii.com/beaches/>

Check out this great site for info on Big Island beaches for family activities like snorkeling, diving, kayaking, swimming or just playing in the sand.

**Hawaii Volcanoes National Park:** <http://www.nps.gov/havo/planyourvisit/ranger-programs.htm>  
Enrich your knowledge of park resources and Hawaiian culture with ranger-led programs.

**Hiking Hawaiian Trails:** <http://www.trails.com/toptrails.asp?area=10015>  
Use this list to plan your next family hiking adventure on the Big Island.

**Imiloa Astronomy Center:** [www.imiloahawaii.org](http://www.imiloahawaii.org)  
Explore the connections between Hawaiian cultural traditions and the science of astronomy.

**Kona Historical Society:** <http://www.konahistorical.org/>  
Go back in history to a store built in 1873 or a 1913 coffee farm and learn about the early days in Kona.

**Kula Kai Caverns:** <http://www.kulakaicaverns.com/>  
Experience subterranean environments of unbelievable beauty during a guided tour of Kula Kai Caverns.

**Lyman Museum:** [www.lymanmuseum.org](http://www.lymanmuseum.org)  
Investigate the natural and cultural history of Hawaii as well as the art and artifacts of ancient China.

**Mauna Kea Visitor Information Station:** <http://www.ifa.hawaii.edu/info/vis>  
Listen to a presentation on recent observations and discoveries from the telescopes, attend an evening stargazing program, or participate in a guided tour to the summit of Mauna Kea.

**Natural Energy Laboratory of Hawaii Authority and Hawaii Ocean Science and Technology Park:** [www.keaholepoint.org](http://www.keaholepoint.org)  
Expand your knowledge about experimental and commercial ventures farming black pearls, seahorses, lobsters, microalgae and more.

**Outrigger Keauhou Beach Resort:** [www.outriggerkeauhoubeachhotel.com](http://www.outriggerkeauhoubeachhotel.com)  
Learn about whales, coral reefs and marine sanctuaries and view free films produced by the National Oceanic and Atmospheric Administration (NOAA).

**Pu`uhonua o Honaunau National Historical Park:** <http://www.nps.gov/puho/>  
Step back in time to a sanctuary of Hawaii's past where traditional Hawaiian lifestyle is preserved.



## Cool Math and Science Websites

Visit us at [www.aauwkona.org/gems](http://www.aauwkona.org/gems) to find links to fun websites.