



How-To Teach Outdoors Strand

Garden Earth Naturalists

Susan Meyers, Stone Mountain Memorial Association
Contact: smmeyers@bellsouth.net

Teach My Students Outside??!!

Marie Bryans, Sharon McCullough, Ashley Potter, Morgan County Middle School

Plants of Muck and Mire

Jerry Hightower, National Park Service
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Chase Street Outdoor Classroom Curriculum Connections

Chase Street Elementary Teachers

The Garden Earth Naturalist Science Night Program



The Garden Earth Naturalist Science Night Program

The Garden Earth Naturalist (GEN) Science Night Program helps children (grades 3-6) understand their school site ecosystem, value the eco-services provided by their ecosystem. The GEN science night kit contains 25 hands-on science activities that address concepts such as Pollination, Soil Production and Recycling, Biodiversity and Water Purification. The kits originated from a partnership between The State Botanical Garden of Georgia, The Georgia Museum of Natural History and Georgia 4-H.

What is Family Science Night? A Family Science Night is an evening program of Science activities in which students and their parents can work together on simple, age-appropriate, inquiry-based science activities. Your students can enhance their learning by participating in a Garden Earth Naturalist Family Science Night. The program uses readily available, low-cost materials. It is a great way to encourage active participation by parents and students.

Where can I check-out a kit?

Chattahoochee Flint Georgia Youth Science and Technology Center

Georgia Southwestern State University, GSW-School of Education
800 Wheatley Street, Americus, GA 31709
Phone: 229-931-2167
Contact: Lynn Larson lpl@canes.gsw.edu

Confederate Hall Historical and Environmental Education Center

Stone Mountain Park www.stonemountainpark.org
Phone: 404-388-8228
Contact: Susan Meyers smmeyers@gmail.com

Fortson 4-H Center

999 Fortson Road, Hampton, GA 30228
Phone: 770-946-3276
Contact: Susie Greer sgreer4h@uga.edu

Georgia Museum of Natural History

University of Georgia, Athens, GA 30602
Phone: 706-542-2280
Contact: Carol Hoffman hoffman@uga.edu

NOTE: GEN Science Night Kits will be available in 3 additional locations in Fall 2010.
Email Anne Shenk ashenk@uga.edu for more information.

PARENTS AS CLUB PARTNERS

GEN encourages children to extend their learning at home by sharing what they have learned with their families. This project component supports research that children's academic success is enhanced when their parents are actively involved. Home based activities include monthly take-home packets and Club calendars that include suggestions for family activities.

Science Nights

GEN also encourages active participation by parents and children by sponsoring science nights. With direction from Dr. Deborah Riddleburger, PRISM liaison and science curricula director, Jackson County, 20 hands-on science activities have been developed that address the topics in the Club modules. Science nights provide a great opportunity for Club leaders to discuss their service learning projects with parents.

For more information how you can get involved with Garden Earth Naturalist contact:

- ✿ Anne Shenk, Director of Education, State Botanical Garden of Georgia, UGA, ashenk@uga.edu
- ✿ Dr. Carol Hoffman, Curator of Education and Outreach, Georgia Museum of Natural History, UGA, hoffman@uga.edu
- ✿ Amanda Marable, Extension 4-H Specialist, Curriculum and Staff Development, UGA, mmarable@uga.edu

Major funding provided by Georgia's Improving Teacher Quality Higher Education Program, part of No Child Left Behind Act

ADDITIONAL FUNDING:
Jackson EMC Operation Roundup
Walton Electric Trust, Inc.

THE TRAINING COMPONENT

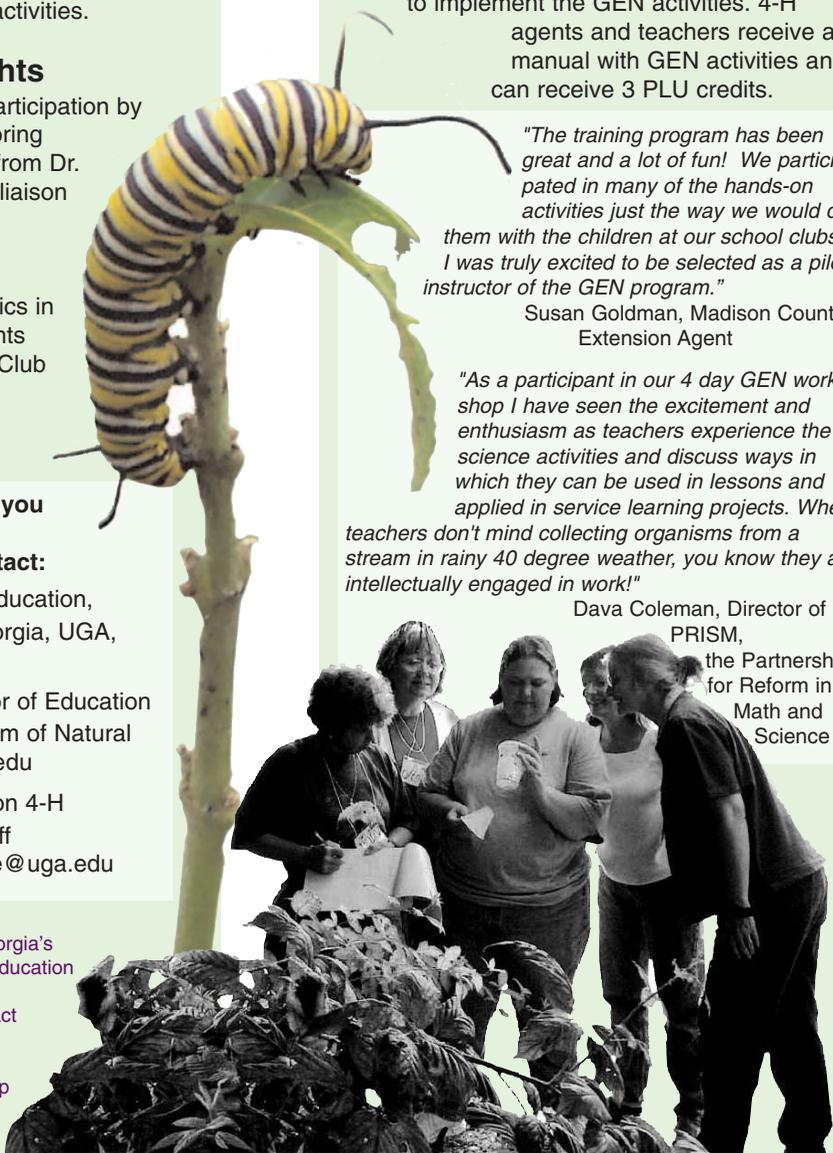
A three day workshop with sustained contact will train and support teachers, 4-H agents and paraprofessionals to implement GEN science clubs at their sites. The workshops are offered at the State Botanical Garden of Georgia, Athens, with follow-up at the participating schools. Each Club receives a kit with supplies to implement the GEN activities. 4-H agents and teachers receive a manual with GEN activities and can receive 3 PLU credits.

"The training program has been great and a lot of fun! We participated in many of the hands-on activities just the way we would do them with the children at our school clubs. I was truly excited to be selected as a pilot instructor of the GEN program."

Susan Goldman, Madison County Extension Agent

"As a participant in our 4 day GEN workshop I have seen the excitement and enthusiasm as teachers experience the science activities and discuss ways in which they can be used in lessons and applied in service learning projects. When teachers don't mind collecting organisms from a stream in rainy 40 degree weather, you know they are intellectually engaged in work!"

Dava Coleman, Director of PRISM, the Partnership for Reform in Math and Science



GEN IN 4-H PROGRAMS ACROSS OUR STATE

Georgia 4-H delivers programs in 5th and 6th grade classes throughout our state as part of ongoing partnerships with local Boards of Education and our State Board of Education. GEN is a new environmental program strand for Georgia 4-H. 4-H agents can elect to implement GEN at their monthly school programs and club meetings.

4-H GEN modules include both an in-school program component and an after school program component. Through these two delivery modes, learning activities are provided to encourage youth to consider pursuing an agricultural or environmental issue to showcase through the 4-H project achievement experience.



"Garden Earth Naturalist materials empower 4-H to serve as the bridge between the formal and non-formal learning environment. Through these materials Georgia 4-H has an opportunity to bring research based information, with a relevant ecological message, to Georgia's youth. The potential for GEN with 4-H is tremendous!"

Mandy Marable, Georgia 4-H Curricula Director

"The GEN curriculum for 5th grade has been a direct complement to the school curricula. Mrs. Jones, 5th Grade teacher at Washington Wilkes Elementary School, was delighted that our Fall 4-H club meetings were a timely review of the materials she had addressed in her classroom. This is an excellent example of 4-H complementing the school curriculum."

Marci Simpson, Wilkes County 4-H Agent

GARDEN EARTH NATURALIST AFTER-SCHOOL CLUBS

Encouraging Scientific Study through Partnerships



Garden Earth Naturalist (GEN) helps children understand earth's ecosystems, value the services provided by these ecosystems, and take positive actions through service learning projects to protect these ecosystems.

A Partnership of:
The State Botanical Garden of Georgia
Georgia Museum of Natural History
Georgia 4-H
Georgia Partnership in Science and Math (PRISM)

GARDEN EARTH NATURALIST CONCEPTUAL FRAMEWORK

Our home, our Garden Earth, is a treasure. Its ecosystems provide valuable ecological services such as pollination, air and water purification, climate control, soil production, recycling, pest and disease control, food production, and a genetic library.

These "free services" can be impacted by human activity and impaired by poor societal choices.

Garden Earth Naturalist (GEN) helps children, grades 3-6, understand the importance of these free services by studying, exploring and enhancing natural habitats on their school sites and in their surrounding communities.

Essential questions for investigation include:

- What life support services are provided by my school site?
- Why should I care about my school site ecosystem?
- What can I do to improve the health of my school site ecosystem?



The GEN conceptual framework helps children understand and value the life support services and complex interrelationships in an ecosystem.

THE 8 GEN CURRICULA MODULES

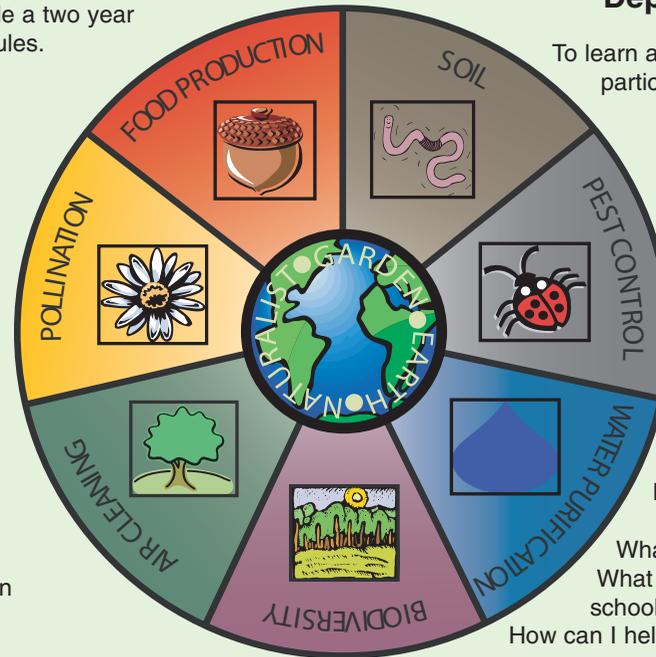
GEN Clubs support teachers in extending science instruction through after-school clubs. Project materials include a two year sequence of Club Modules. Topics follow:

Year 1

- Pollination
- Food Production
- Air Cleaning & Climate Control
- Soil Production & Recycling

Year 2

- What is an Ecosystem?
- Pest & Disease Control
- Biodiversity
 - Water Purification



POLLINATION: A SAMPLE GEN MODULE

Welcome to the Pollination Department!

To learn about pollination students participate in these activities:

- Pollination Relay Race
- Flower Inquiry
- Pollinator Insect Count
- Pollinator Preference Experiment
- Suga's Helpful Pollinators!
- Puppet Show and Role Playing Game

Essential Questions:

- What is pollination?
- What pollinators visit my school site?
- How can I help pollinators at my site?

Each after-school module is research based, tailored to varying delivery methods, engaging and fun for the learner, as well as relevant to today's youth.

Module Resources:

- Curricula
- Kit supplies
- Student take-home packets
- Service learning opportunities

How can I improve my school site ecosystem?



SERVICE LEARNING PROJECTS

Service Learning Projects

Club members help to improve their school site (or local community) by participating in service learning projects.

Examples of service learning projects include planting a variety of native plants to increase school-site biodiversity, monitoring local bird populations, planting ground covers to protect the soil or implementing a school wide campaign on the importance of clean water.

ISSUE	⇒	SERVICE LEARNING
Lack of pollinators		Plant flowers to attract pollinators

Ideas from service learning activities arise from school site investigations. After monitoring pollinator populations by conducting a pollinator count, students may decide to plant flowers to attract more pollinators to their site and then monitor the pollinator population.

"At Fowler Drive we have had as many as 33 students on the club roster at a time. I still have a waiting list and students ask me every day if they can get in 'science club!'"

Halley Page, Fowler Drive Elementary School
Clarke County



Suga and Her Six B's: Puppet Show

(Most suitable for 2nd and 3rd grades)

Essential Question(s):

*Who/what are the Pollination Department workers?
What is pollination?*

Background Information: see *Background Information for Garden Earth – Pollination Department*

Getting Ready:

Decide who will perform the puppet show. Will it be the learners, the teachers or a classroom volunteer? Two puppeteers will be needed for this puppet show. One puppeteer will play Suga, Brody Beetle and Blanche Butterfly while the other will play Foreco, Bertha Bee, Brian Bird and Breezy.

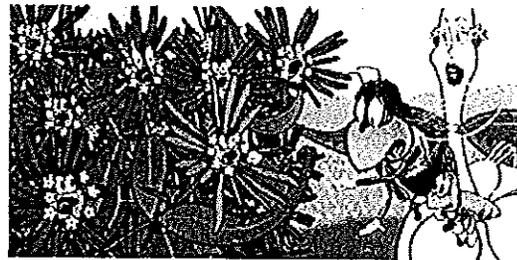
Print templates for the puppets on card stock, color and laminate them. Set up a simple stage for performing the show. Assemble props as needed. Beatrice Bat will need to be attached somewhere above the puppet theater, where she will be seen in the puppet show.

Procedure:

1. Assemble the learners in front of the puppet theater. Tell the learners that Suga, a lovely flower puppet who manages the Pollination Department, would like to visit and tell them all about pollination. Ask the learners if they know what pollination is.
2. Perform the puppet show.

Discussion/Assessment:

- What is Suga's job in the pollination department?
- Who are Suga's 6 B's?
- What work did they perform?
- Which 'B' was the most important?



Suga and her workers make sure all of the plants are pollinated.

Location: Puppet Theater

Objectives: Learners will

- 1) meet Suga and learn about pollination and the animals that help to pollinate flowers

Skills: communication, listening, empathy, analysis

Supplies:

- **Puppets**
 - Foreco
 - Suga
 - Bertha Bee
 - Brody Beetle
 - Blanche Butterfly
 - Brian Bird
 - Breezy
 - Beatrice Bat
- **Props**
 - Paper flowers filled with baby powder or flour
- **Script:** Suga and her Six B's

Subjects: language arts, science

Time: 20 minutes

Suga and Her 6 B's: SCRIPT

Foreco: Welcome back to my Garden, girls and boys. I have someone for you to meet who is really important. Here she comes now. It's Suga Magnolia. She and her workers are in charge of the flowers at the Garden. Hi, Suga.

Suga: Hi, Foreco! You sure are looking lovely this morning... just touched with the morning dew.

Foreco: Why, thank you. These nice boys and girls would like to visit your Pollination Department and meet some of the workers. Would you show them around, Suga?

Suga: Why certainly, Foreco.

Foreco: Thank you so much. I really must be going now. I need to check up on Oli Earthworm in his Soil Department. Bye!

Suga: Boys and girls, welcome to my Pollination Department. I have a very big and important job--pollinating flowers! I have lots of workers to help me, and I just love talking about them. Boys and girls, I **always** think of my very best workers as the "6 Bs". Here are some of them now. It's Bertha Bee and Brody Beetle.

Bertha Bee: (*flying and buzzing*) Hi, Suga... hi, kids... the other bees--as in "bumblebees"-- and I are the most important of Suga's 6 B's We fly from flower to flower all day long pollinating the flowers. . buzz, buzz.

Brody Beetle: Bertha Bee you know that's not true. We work just as hard as you bees.

Bertha Bee: Oh no you don't!

Brody Beetle: Oh yes we do! You bees miss a lot of the flowers that have a stinky smell and grow close to the ground. Suga depends on us beetles to visit them!

Suga: There, there now, do not argue . . . my 6 B's are equally important. Everyone has a job and an important one at that. You are both very hard workers.

Brody Beetle: Well, I've got to get back to that hard work right now. Bye (*Flies off*)

Bertha Bee: Hey Miss Suga. Do you want to hear a joke? What did the flower say to the bee? (*pause*) It said Buzz off--- hee, hee, hee.

Suga: Oh Bertha, you are funny! Oh look it's two more of my 6 B's. It's Blanche Butterfly and Brian Bird.

Blanche Butterfly: Hello Suga. *(slow, seductive voice)* I'm busy over here drinking delicious nectar from the flowers. We butterflies are the most glamorous of all the pollination workers! Boys and girls don't you think my wings are pretty? *(pause for learner's answers)* I think I will just sit over here on this flower, drink nectar and enjoy the warmth of the sun on my wings.

Suga: Brian, would you say Good Morning to the children?

Brian Bird: *(darts and shakes its wings, repeat jerky movements)* Good Morning children, my name is Brian Bird and I am a hummingbird. I love to drink delicious nectar, too. I move very fast, my wings beat so fast you can't even see them move! Can you guess how many times I beat them per second? *(pause)* 60 beats per second!

Bertha Bee: That's super fast, even faster than us bees. *(Buzzes over to Suga)* Miss Suga, THE BUZZ around the hive is that you have a great singing voice.

Suga: Oh stop, you're embarrassing me, but I guess that the children might enjoy a song. Would you children? I would just love it if you children would join in with the chorus. Would you do that for little ol' me?

(If you do want the children to join in with the chorus it helps to have Suga practice the chorus with them first)

(Sung to the tune of Handel's Hallelujah Chorus)

(Suga warms up her singing voice, la, la, la)

Suga: What do bees do while drinking nectar?

Brian Bird: POLLINATION,

Bertha Bee: POLLINATION,

Blanche Butterfly: POLLINATION

Bertha Bee: How do we get new plants in the springtime?

Brian Bird: POLLINATION,

Suga: POLLINATION,

Blanche Butterfly: POLLINATION

Suga: What makes my workers sticky with pollen?

Brian Bird: POLLINATION,

Bertha Bee: POLLINATION,

Blanche Butterfly: POLLINATION

Bertha Bee: What makes trees grow fruit in our nation?

Suga and Bertha Bee: POLLLL – LINNNNN – NAAAAAT - TIONNNN

Bertha Bee: Why Suga, you really **are** a good singer.

Suga: Oh you flatter me. Anyway, let's get back to our 6 Bs.

Bertha Bee: Wow, it's getting a little windy here.

(As Breezy enters the stage Suga and Bertha both move the opposite way as if being blown by the breeze)

Suga: Why it's my fifth worker, Breezy! How is work going?

Breezy: Oh it's a breeze, this pollination work!!! I just carry the pollen and let it fall wherever. There is so much of it that I don't worry too much about where it goes. Some is bound to hit the right plants and trees!!!

Suga: Now let me think, Bertha Bee, Brody Beetle, Blanche Butterfly, Brian Bird, Breezy...that's five of my workers. I have one more important worker - my 6th B. Now who and where is she? *(She sees her hanging upside down in a tree above the children)* Boys and girls, I have so many important B workers that sometimes I forget one of them. But there is Beatrice Bat, hanging in the tree above y'all. She sleeps all day long and comes out at night to eat fruits and pollinate my flowers. Let's just let her sleep.

Bertha Bee: Suga, can I tell the boys and girls about my important pollination work?

Suga: Why sure, Bertha.

Bertha Bee: Boys and girls, pollination is my work and it's hard work at that! I put my head in a flower like this and I drink delicious nectar. *(demonstrates with head and belly in a small cup of baby powder that is inside a big flower)* Yum! It sure is good! Then I brush some of the pollen from the flowers onto my legs like this *(powder flies in air)*. . . then I fly . . buzz. . buzz. . . buzz. . . to another flower and I drink delicious nectar *...(slurping sound)*... and then I fly to another flower . . .buzz, buzz. . .

Suga: Bertha Bee, could you tell them what happens after you take pollen from one flower to another flower?

Bertha Bee: Sure! The flower can make delicious fruits and important seeds after I do my pollination work. Boys and girls, can you say pollination? *(Wait for children's response.)*

Suga: Thanks, Bertha.

Bee: Sure, Suga. I need to buzz back to my hive now.

Suga: Well, as you can see Boys and Girls, I have a lot of work to keep up with in my Department. I enjoyed showing y'all around, but I must go and check up on the work of some of my newest honeybees. See you later!