

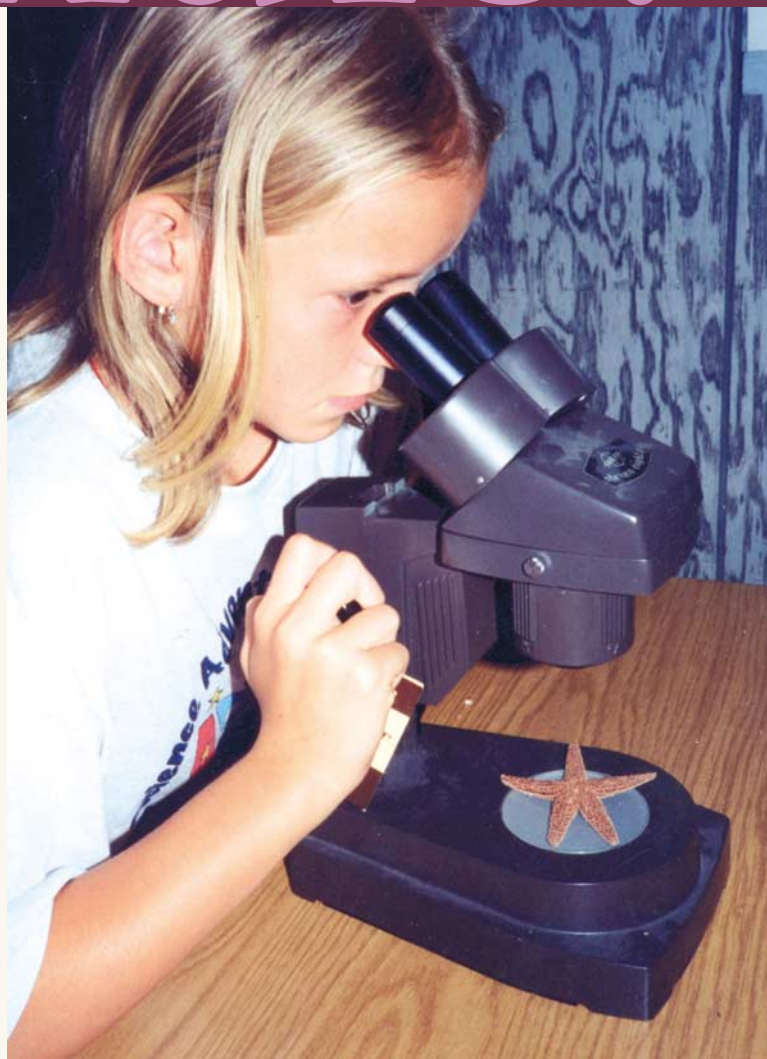
Girls in Science Rule!

A camping experience
for girls can foster
positive attitudes about
learning science.

By Jan E. Moore

The “great outdoors” was the learning ground at an exciting, activity-filled science camp for girls sponsored by educators from Eastern Kentucky University in Richmond. The overnight weekend camp, known as Girls in Science Rule!, was created for girls entering sixth grade who want to learn science and explore science-related fields.

The camp was developed specifically for this age group because is it often during the middle school years that children begin seriously considering career choices. And, even today, in the twenty-first century—though more females are majoring in the sciences and in engineering than ever before—women remain a minority in many scientific disciplines.



PHOTOGRAPHS COURTESY OF THE AUTHOR



Figure 1.

Campers' poems.

Forest
green, dense
large, mysterious, full
Queen of the wild
Forest

Rabbit
soft, scared
hops, jumps, hides
wanting to pet it
Bunny

Camps like Girls in Science Rule!—with its activities that promote positive attitudes toward science, develop participants' science-process skills, and celebrate girls' and women's achievements in science—may lead more women to pursue careers in science, hopefully reducing the gender disparity in the field.

Life at Maywoods

Girls in Science Rule! was held at Maywoods, an environmental laboratory owned and operated by Eastern Kentucky University. Maywoods contains about seven square kilometers of wooded area, with a lake, lodge, and several hiking trails throughout the forest. The camp featured a range of environmental education experiences for participants, including indoor activities, such as using a microscope and a video flex camera, and outdoor activities, such as hiking and learning nature survival tips.

Students from Eastern Kentucky University—who were majoring in elementary education with a science emphasis—served as the camp's activity leaders or "trainers," receiving a small stipend for their efforts. The trainers led the girls through the activities and were the heart of the program. The trainers were excellent role models: they were young (so the girls related to them), female, and interested in science. And, they worked side by side with camp participants, modeling that women can do science successfully.

The lodge at Maywoods provided accommodations for the girls and trainers. The facility was equipped with a restaurant-style kitchen where all meals were prepared. Funding for the camp was obtained from Eastern Kentucky University and The Mid-South Educational Research Association, a nonprofit incorporated organization representing several southern states that encourages quality educational research in schools and institutions of higher learning.

As director of the camp, I was present at all times. I was the "woman behind the scenes." Primarily, I selected the trainers and activities, arranged transportation and lodging, provided support to trainers, and cooked and prepared meals and snacks. My role was to ensure that the event ran as smoothly as possible and that everyone had a positive learning experience.

'Scopes and Sight

When camp started, the girls were eager to explore Maywoods's forest and hiking trails. After a nature walk in the woods, the girls returned indoors to view under a microscope some of the items they had collected outdoors, such as insects and leaves with fungi.

The insects provided a wonderful source of amazement and amusement. Students used microscopes to view details of insect parts and dissecting scopes to examine entire insects, sticks, leaves, and trash. The

cussed the insects and snakes that could possibly be encountered in the area. They also instructed the girls never to leave the trails and to stay with their trainer.

Tracking Adventure

After learning the woods safety rules and practicing their trail signs, the girls participated in a tracking adventure to put their newfound skills to the test. The girls were divided into two groups of ten. Group One ventured out for a walk in the woods, selecting a

After a nature walk in the woods, the girls returned indoors to view under a microscope some of the items they had collected outdoors.

girls were surprised at what they could learn about wildlife simply by studying evidence found on leaves. One student said, "I didn't know a leaf could be a home and food at the same time."

Next, we introduced what would be the girls' favorite gadget throughout the event, the video flex camera. We connected the camera to the television so all girls could view all of the objects. They viewed parts of a tarantula, a poison ivy lesion, and one participant's mouth, among numerous other interesting objects. They took advantage of every opportunity between activities to view other objects around the lodge.

Trail Know-How

Later in the camp, trainers taught the girls how to recognize and leave handmade signs on trails in the event that they got lost. For example, when faced with a fork in a trail, hikers should leave a sign indicating the path taken. One such sign might be to pile several sticks in the shape of an "X" in front of the chosen trail. Another might be to create a pile of rocks in the center of a trail, placing one or two rocks from the pile on the left side of the fork if they've chosen to take the left fork, or one or two rocks in the right side of the fork if they've chosen that direction.

Students were instructed to make the signs obvious, leaving little doubt that these could have occurred incidentally. The trainers discouraged the girls from creating trails of food or broken sticks, explaining that animals might eat the food, leaving no trail, and broken limbs are too common in the forest.

The trainers also shared tips about how to stay safe in the woods. For example, they provided the girls with information about how to identify poison ivy and poison oak and dis-

route from the many available trails and leaving signs for Group Two to find and follow.

Group Two began tracking after giving the first group a 20-minute head start. As they came to forks in the trails, they had to decide which trail the first group had chosen. At first, the girls were unable to distinguish signs from incidental breakage in limbs and displacement of leaves. One girl exclaimed, "Hey look at this branch, its broken!" Another stated, "Yeah, but that's not a real sign, anything could have done that." Then after being reminded to look for the specific signs they had been trained to use and recognize, they began distinguishing real signs from insignificant observations. Real signs left little or no doubt that they were left by the first group.

The girls were ecstatic when they were able to successfully track the others by applying what they had learned. You could hear them exclaiming, "Oh,

In an indoor activity at the camp, students demonstrated the effects of pollution using a model.



Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

Grades 5–8

Content Standard G: History and Nature of Science

- Science as human endeavor
- Nature of science

look, this has got to be a sign!” while others were observing trails for evidence of foot tracks. As Group One heard Group Two coming up the trail, giggles were heard throughout the forest. When asked which activity participants enjoyed the most on an evaluation, this was their favorite activity. One girl commented, “I feel safer in the woods now.” Another stated, “I can teach my little sister this stuff!”

Pollution Solutions

Back at the lodge, students worked with a model that demonstrated how motor oil, insecticides, fertilizers, factory waste, and other substances can pollute a water supply. The plastic model looked like a small town, with topographical features such as houses, schools, farms, rivers, streams, and hills. It contained fluids that represent motor oil, pesticides, and fertilizers and provided narratives for teachers to follow, such as, a farmer has spilled oil from his tractor, fertilizer is put on yards and golf courses, etc. (Models like this can be purchased from a science supplier for about \$1,000. Our school district owns one for teachers to check out for use in their classrooms.)

As the girls observed the model, the trainers asked such questions as

- “What do you think will happen to these pollutants when it rains?”
- “Where do you think these pollutants will go?”
- “How does this affect our ground water?”
- “What is a watershed?” (For more on this topic, see *Science 101*, page 17.)

The girls then used a spray bottle filled with water to simulate rainfall and recorded their observations. The model demonstrated how rain washes away oil and fertilizers and then flows to other areas. The girls were surprised to discover how something put on a lawn, such as fertilizer, could affect the streams and rivers in the area.

Lastly, the group brainstormed ideas to reduce the amount of pollution produced by runoff. Some sugges-

tions included properly discarding used oil, having a professional change the oil and properly discard the used oil, reducing the amount of fertilizers used on lawns, and doing away with fertilizers altogether.

Nighttime Thoughts

At night, girls sat outside on the lodge deck and created poems about their day, capturing their thoughts and feelings about their experience. This activity was another favorite among the girls. Afterwards, those who wished to share their poems read them aloud. Figure 1, page 39, shows two students' examples.

Poetry writing was a perfect end to the day. It was a quiet restful activity that helped settle the girls for sleep.

Attitudes and Success

Girls in Science Rule! provided a positive science learning experience for participants. Before camp began, we collected “attitude surveys” from each attendee. The surveys focused on participants' confidence and anxiety levels related to doing science. After the camp experience, they completed the survey again. The surveys revealed significantly more positive attitudes toward science after attending the camp than before it. When asked if they would be interested in attending similar program another time, all of the girls enthusiastically answered, “Yes!”

So, if you love science and you are interested in promoting science to girls, try planning a camp of your own—the earlier the better. We've recently begun developing programs targeting girls in elementary schools. Based on my own experience, I'm hopeful that these new programs and others like them will draw more and more women into the exciting world of science. ■

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Resources

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