

Students Compete at Mathematical Forest Expedition

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Crunching numbers in math class can sometimes cause a student to ask the questions, “Why do I need to learn all this stuff? Does this really apply to real life?” The answer to both is a very definite “yes.” To demonstrate this point, the students in the Connections math class at Coosa County Central High School were invited to participate in a program called the “Mathematical Forest Expedition.”

The idea came to Coosa County Extension Coordinator Roger Vines about a year ago and a grant proposal was then developed and submitted to the Coosa Valley R, C, and D Council. Upon receiving approval for the project, Vines teamed up with the Coosa County Forestry Planning Committee and Coosa County Central High School math teacher, Amy Tucker, to pull this project together.

The idea was to take the math class out to a farm and let them use their math skills to solve real world problems. While Mrs. Tucker had already provided the math background, the students still needed some training on basic terms and concepts related to forestry and wildlife management on a tree farm. Forestry Planning Committee members Doug McConnell and Roger Vines visited with Mrs. Tucker’s class a couple days prior to the event to provide some in-class instruction. The students learned about calculating board foot volumes of timber, calculating acreage, mixing herbicides, pond construction, fertilizer applications, estimating wildlife population growth, tree planting, and estimating financial returns from growing timber.

The following Tuesday, the class rode the school bus to the Vines TREASURE Forest not far from the school. The students were divided into teams of five, then rotated through six different stations. At each station they were challenged with different



math problems and common calculations made on a farm. The event was conducted as a competition among the teams for high score.

At the first station, consulting forester Doug McConnell had the students measure the circumference of a tree, calculate the diameter using pi, and then use the Pythagorean Theorem to convert the round tree to a square log. Next, the students calculated the cubic inches of wood in the tree, converted this to board feet, and finally applied current prices to estimate the value.

Annette Spivey with the USDA Natural Resources Conservation Service led station #2, in which the students measured the dimensions of an earthen pond dam including length, top width, height, and base width. Since this forms the shape of trapezoid, the students then calculated the cubic foot volume of the dam, converted this to cubic yards, and applied current construction rates to come up with the cost of building the pond. They also figured how many gallons of water would be added to the pond after a one-inch rain – over 32,000 gallons!

At station #3, Bryan Wood, an engineer for the City of Auburn, had the teams measure the size of a wildlife food plot. The students then calculated how many pounds of seed would be needed to plant the food plot. They also used soil test recommendations to calculate the number of pounds of fertilizer and lime needed on the site. Finally, they were asked to project the growth of a deer herd over a three-year period.

Next the teams moved to station #4, led by Roger Vines. At this station, the participants measured off a 1/10th acre sample plot of timber. Then they determined the number of trees per acre, average diameter of the trees, and average height of the



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WHAT'S BLACK AND WHITE, AND RED ALL OVER? FOX SQUIRRELS, OF COURSE!

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In Alabama, litters of two to five young fox squirrels are born from late January through March, with second litters produced in July and August. Gestation is about 44 days. Yearling females breed at about 10 months of age and generally skip a breeding period before producing a second litter. Older females in good physical condition most often breed twice each year when food supplies are good. Almost all summer litters are raised in leaf nests in the branches of trees, as are many winter/spring young in the southern part of the state. Hollows in trees (when available) are more commonly used for brood rearing and shelter during winter in northern parts of the state.

Throughout their range, fox squirrels eat a variety of wild foods including acorns, nuts, seeds, fleshy fruits, buds, flowers, bird eggs, insects, tubers, roots, and fungi. Pine seeds are a favorite food during the limited time they are available (late summer), while hard mast is of critical importance during fall and winter. At all times fox squirrels are opportunistic feeders. Most water is obtained from eating succulent vegetation and fruits, or by licking dew from leaves. During periods of extreme drought, however, surface water may become necessary for survival. Calcium and other minerals largely lacking in vegetable foods are obtained by gnawing bones and antlers or by eating soil.

Habitat varies considerably both regionally and locally, including a variety of forest types. Throughout western, mid-western, northeastern, and central portions of their range, fox

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squirrels are most often found in relatively small or narrow stands of mature hardwoods having little understory vegetation and incomplete canopy closure. Those living in the Atlantic and Gulf Coast regions, including Alabama, are known to occupy virtually all of the diverse forest habitats, but have been most strongly associated with mature, fire-maintained pine forests. Research done in Alabama and elsewhere in the coastal region indicates that while fox squirrels may spend much of their time in pine stands, hardwood habitats adjacent to or within these areas may be more heavily used than would be expected based on their limited availability. This relatively intense use of hardwood habitats likely points to their importance to fox squirrels for both food and cover.

Life is full of questions, many of which, sadly, go unanswered. Children are among the best at coming up with difficult questions and trying to stump grown-ups. This being the case, odds are that the most recent time you were asked, "What's black and white and red all over?" was not the last. Next time, forget newsprint, sunburn, and road-kill. Answer, "fox squirrels!" 🦫

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trees. They converted this into the number of cords and tons of pulpwood that could be harvested. Then the groups applied current timber prices to estimate the financial value of the stand.

Consulting forester Sara Baldwin led station #5 dealing with herbicide mixtures. The students calculated the number of ounces of herbicide needed to treat the area, how many gallons of water per acre would be applied, and how much water and herbicide to put in each tank of the 3-gallon sprayer. They also solved problems based on mixing a percent solution spray mix.

The final station was led by Blake Kelly, forester with the Alabama Forestry Commission, at which the participants determined how many tree seedlings were needed to plant a given area. From there the students extrapolated to a larger acreage, determined the cost of site preparation, tree seedlings, and planting. These expenses were then compared to projected income

calculated by applying today's timber prices to growth and yield tables for loblolly pine.

After a lunch sponsored by the Coosa County Farmer's Federation, each instructor went over the problems from their respective stations and answered questions. To conclude the program, the winning teams were announced. Winning team members received a trophy and cash award, sponsored by Bryan Wood and CGS Surveying. Bryan is a former Coosa County 4-H Forestry and Wildlife Team member who enjoyed the success of two state championships and placing second and third in two national 4-H Forestry and Wildlife events. He simply wanted to give something back. Thanks also to Pete Rodgers with Coosa Valley R, C, and D Council and Coosa Forestry Planning Committee members Tom Reichert, Raymond Shaw, Lori Woodfin, and the AFC's Ricky Porch. 🦫