



Earth science has a field day

The dream begins with a teacher who believes in you, who tugs and pushes and leads you to the next plateau, sometimes poking you with a sharp stick called "truth." —Dan Rather.

— by Stephen C. Letchford, LS

At Matoaca Middle School in Chesterfield, Virginia, Cheryl Clark, earth science teacher, and the school's vice principal Shannon Bramble "tugged and pushed" to create, with the help of local surveyors, an earth sciences field day like no other.

The field day, now in its second year, was held in March, at the school's campus and at Matoaca Park. Five survey stations were established. To enrich student's knowledge and experience, five student teams were created to test their mettle with conducting topographic surveying and mapping, determining elevations from angles and heights, and using GPS and other current surveying methods.

At the stations, the students participated in a Robotic Relay Course and tried to solve four challenges: a Law of Cosine Challenge, an RTK Rover Topo Challenge, a Trig Elevation Challenge, and the Challenge of Distance Stadia.

In the Law of Cosine Challenge, which was judged by Andy Bowles, LS, senior surveyor with Tommy Barlow & Associates, students were tasked with calculating a missing line using angle measurement, chained distances, and the Cosine Rule.

The Robotic Relay Course was a practical demonstration of some of the strengths and challenges one faces when surveying with a robotic total station. The course was given by Bob Leyden, Survey Coordinator with Gardy & Associates, PC, who also timed as they navigated a rather challenging course without losing lock.

Each of the five student teams took the Trigonometric Elevations challenge. To solve it, they had to calculate the elevation of various points on the ground using a survey instrument measuring slope distances and zenith angles only. Mike Carris, LSiT, president of Carris Technology Solutions, advised students on how to use math to solve this challenge and judged this contest.

The Stadia Distances challenge was set up to illustrate how to calculate the total perpendicular distance between five points and a survey baseline. William Ware, Jr., LS, and Stephen Letchford, LS, organized this challenge.

Organized by Tommy Nichols, LSiT, sales associate with Allen Precision, the RTK Rover Topo challenge was, by all accounts, a favorite since the students could see what was being located in real time, on the controller computer



L-R: Clarke and Bramble



Calculating a missing line, with Andy Bowles, LS

screen. Nichols, being the consummate instructor that he is, had an unending amount of enthusiasm for each group of students that came his way. His extremely generous donation of ten compasses for the winning team was very much appreciated by all involved.

What a difference a year made in this fledgling program at Matoaca Middle School! In 2009, forty students from one class participated; this year, sixty-five students from three classes participated. Six surveyors, eight parent volunteers, and four teachers were involved in pulling this great event together.

Word of Matoaca's field day has reached Dr. Jeremy Lloyd, Director of Science for Chesterfield County Schools, who expressed great interest in expanding the program to include multiple middle and high schools within the Chesterfield region, so that more students could be exposed to the practical application of the mathematics taught in county schools.



Robotic Relay; Clarke navigates Leyden's challenging course



Measuring slope distance and angles to calculate elevation



Reading the stadia hairs on a rod 100' away

Many thanks to all who participated in this year's field day, but most of all to the students who showed appreciation for demonstrations of what surveyors can do with the math and earth sciences being taught by their teachers. We hope that one day, a few of the bright minds we had the privilege to meet will think back on this event and decide to become part of the next generation of land surveyors in Virginia.



Taking the RTK Topo challenge with a total station

If you would like to take part in next years event, need further information, or have an idea on how we might improve the program going forward, please feel free to contact Stephen C. Letchford, LS (804)267-1258; (sletchford@jmt.com)