

Chuck Trautwein with FRC Team 1629 has some neat resources using mathematics as teams build their robots and plan strategies. Check out his article here.

Nestled in Appalachian Maryland, *FIRST* Robotics Competition Team 1629, the Garrett Coalition or GaCo for short, believes it can make a difference in the schools, community and, most important, in the students the team serves. And not a difference in just the student members of GaCo but a difference in every single youth in and about Garrett County.

GaCo believes it can make a difference because everything the team does, supports a single vision of every student achieving that ah-ha moment which develops their potential and success in STEM. There's much research that indicates a very narrow window of opportunity for children 8 to 11 years of age to acquire foundational skills such as spatial reasoning which are essential to their success in STEM. Having a vision that is research based and measurable with a strong action plan ensures GaCo is making an impact.

One of the many initiatives GaCo is implementing to bring about its vision is something the team calls "STEM Waypoints." Just as someone using a GPS can establish waypoints so that they have places in which to return in case they get lost, GaCo has established "waypoints" that every third, fourth and fifth grade student in Garrett County can build their "STEM Readiness" upon. Through the team's STEM Waypoint initiative, GaCo students conduct "STEM Readiness" lessons to every third through fifth grade classroom in its school system in which students build and keeps a token of each year's experience.

GaCo's STEM Waypoint initiative has been phased in over the last three years. For the last three years GaCo students will have visited every third grade classroom and build on a student's understanding of multiplication by building a LEGO top spinner. This will be the second year that GaCo will be visiting all fourth grade classrooms teaching about the rudiments of binary numbers through "number guessing cards" in which fourth grade students learn and get to keep. This year, GaCo students will be continuing to visit every third and fourth grade classroom as well as every fifth grade classroom to introduce students to ratios and more specifically, the "Golden Ratio", where every student will build and keep a pair of LEGO calipers which exactly determine the golden ratio.

According to Ms. Barbara Baker, Garrett County Interim Superintendent, "GaCo's STEM Waypoint initiative is really exciting on so many levels... not only helping to ensure that our elementary students are STEM ready, but what a marvelous opportunity for the team's students to conduct these lessons - truly a win-win for all." Patrick Lee, GaCo high school junior, who has taken the lead on this project states that "it's great to have the opportunity to go back to the

same elementary classrooms in which I learned to ensure students have the experiences they need to be successful in STEM and someday go back to their past classrooms to do the same... and even if it makes a difference with only one student, it makes the whole effort worthwhile."

GaCo will be ready to share the success of their STEM Waypoint initiative with all the teams they will be competing with during the upcoming district events as well as several education conferences in the Spring including the National Math Festival (NMF) in Washington, DC on Saturday, April 22, 2017. At the NMF GaCo will also showcase their partnership with a new web-based platform called [vCalc](#) (vCalc.com) sort of a wikipedia for math formulas, equations and data sets. 1629 has a page on vCalc [here...](#) to calculate robot velocity.

More lesson plans and materials supporting GaCo's STEM Waypoint initiative can be found at garrettcountyschools.org/frc1629.

GaCo has offered to answer any questions about their initiative or any of the other programs they have established to bring about their vision of "STEM Ready kids." Contact chuck.trautwein@garrettcountyschools.org.