

Team 4499, The Highlanders, is dedicated to developing future leaders and innovators through our emphasis on STEM education and community outreach. Our motto, "It's not about the game, it's about the journey," captures our drive to enhance our real-world skills through the opportunities presented in FRC. Creating a custom kilt and developing our impact share the same distinctive approach, characterized by the selection of tartan, accurate measurement, precise creasing folds, and final touches, resulting in generational transformation across the globe.

TARTAN

A tartan is a patterned cloth consisting of crisscrossed, horizontal, and vertical bands in multiple colors. Like our team members, we are all made up of different backgrounds and specialties, and together we mesh like a tartan pattern.

Our leadership model is at the core of our efforts to groom 4499 students into future engineers. Represented by the tartan pattern of our impact kilt, the TARTAN Leadership initiative (Training And Readiness: Teach, Appoint, iNteract) guides our models for leadership, skill development, and community engagement. Our community-based and student-led team, of students from diverse backgrounds, overcomes geographical barriers, financial limitations, and limited educational opportunities through this initiative. Embracing physical and virtual environments, our team has consistently demonstrated excellence in building future engineers.

The Cycle of Success (COS) initiative is the path for students to become future leaders and innovators. Starting with involvement in the Highlanders, students build skills and connect with prominent sponsors and companies such as Neaera Consulting, Lockheed Martin, and Woodward. These connections lead to valuable internships, allowing students to develop their skills further gaining experience at companies like Tesla, Leidos and Xilinx. Some students secure jobs at Neaera Consulting giving back to the team's nonprofit, Neaera Robotics. Throughout their journey, students stay connected with the FIRST community and continue to support the Highlanders, ensuring the continuation of their impact and knowledge. Neaera Robotics was established in 2013 as a 501(c)(3) nonprofit, to support future engineers. We aim to provide funding and resources to FIRST teams across the Front Range, enabling students to build their skills and pursue their passions. Over the last three years, our graduates have given back to our team and non-profit by providing \$150,000 and countless hours of mentoring support. Our nonprofit started as a FIRST incubator in Northern Colorado and has now grown to support 6 FIRST teams across the Front Range.

MEASUREMENT

Just as a kilt is measured to fit the wearer, The Highlanders are unique in our approach to robotics and community outreach. We ran the Liberty Qualifier for 10 years and supported 4 additional FLL Challenge Qualifiers and 2 FLL Explore events with volunteers. Even during the COVID pandemic, our support continued. We made promotional FRC and FIRST videos to inspire students at virtual events. We continue to share how the FIRST program impacts students' lives by demonstrating our robot at 8 community demos. Kids run up to the robot asking endless questions about the functionality as they learn more about their future with FIRST.

In addition, our team support is unyielding. Teams across Colorado turn to us to help develop parts, ideas, and designs. On our Drop-in Shop days, teams are welcome to use our shop with Highlander's support and assistance. We've had 8 FTC, and 13 FRC teams use this and get parts made. We helped FTC team 18137 when their robot, unfortunately, was involved in the Marshal fire; we worked to help them repair and prepare for their upcoming tournaments. We continually share presentations about programming, concepts, structure, and the game, at the FLL Power Up event.

We present the FIRST organization to the public through a variety of activities. We show how impactful the FIRST program is in 1 parade, 1 conference, 18 non-FIRST events, and 8 demonstrations. Younger kids play with robots and learn more about what they can do to create these robots someday. We talk with parents about the programs' positives and how flexible they are for different ages. Halloween sparked our creativity with a new way to engage our community. What started as demoing at HP's Haunted House event has led to our annual passing out candy to neighborhood kids or local community center. 4499 put together our first robot costume, a spider robot with spray-painted pool noodles and duct tape. Since then, 4499 has made a scarlet dragon with pneumatically powered wings, a head-bobbing snake, LED-lighten ghost and, our newest, a curious giraffe. To engage the youth, we share the FIRST core values through our Rocky the Robot books at local schools and tournaments and have since translated them into 4 languages. **We** share our knowledge of FIRST through our students' representation on the Colorado FIRST Student Advocacy Group(CFSA). Two 4499 students are part of this leadership group where they work to share FIRST from a student perspective with their fellow teams in Colorado.

We inspire students through our custom coloring books, activity packs and science kits (KILTS and CABER) to spark interest in STEM. Our KILT kits are 7 experiments that use reusable household items to learn simple fundamental science disciplines. Our CABER kits motivate students in STEM by assembling and programming rovers to teach a variety of engineering concepts. While traveling to remote tournaments, we have visited 3 local schools to donate our KILTS kits and encourage students to visit the FRC tournament in town. Our KILTS and CABER kits have grown internationally by visiting 4 additional countries, Jordan, France, Peru, and India, where we have shared the hands-on experience of STEM. We have gone to refugee camps, orphanages, community spaces, and schools where we can inspire kids of all ages and diverse backgrounds. Additionally, our kits leave an ongoing impact. In Jordan, local leaders use our kits with the programs we have started. We plan to continue our support and local presence at schools and events as well as maintaining relationships in areas like Jordan, where we are working to start additional FIRST programs.

PLEATS

Pleats are a pattern and a sign of quality in kilts creation. As our students go through the Highlanders model, they have the opportunity to interact with new people and entities in the professional world. Our integration with MIRV and VRUM has allowed us to demonstrate the quality of the FIRST and Highlanders model to a larger audience.

Our recent projects, VRUM and MIRV, have made a significant impact on our community while showcasing the skills we've learned through FIRST. VRUM, an app designed to increase pedestrian safety, is a direct result of our team's efforts using FIRST skills to make a difference. MIRV, an internship opportunity funded by a \$150,000 grant from USDOT and the Virginia DOT, and provided by our main

sponsor Neaera Consulting, allowed us to work with degreed engineers (4499 alumni) creating an autonomous rover that reduces the danger to first responders.

The high quality and cost-effectiveness of our results have attracted the attention of establishments such as USDOT and VTTI. We promote FIRST by sharing our experience and success in creating practical prototypes and providing professional results. Additionally, our projects support our outreach events and materials, which fund the team and provide a solid foundation for maintaining a growing pipeline of future FIRST participants and STEM professionals.

Our projects and partnerships demonstrate that the Highlanders and FIRST students are productive members of our community. Our efforts towards creating a safer community and promoting STEM education make us valuable to companies seeking to support FIRST initiatives.

FINAL TOUCHES

At the completion of building a kilt it's important to make sure that every stitch and accessory is completed to a high standard as they are unique and special. In the same way we improve and perfect each outreach idea and connection with our community to make them impactful and transformative.

4499 is committed to impacting the world through STEM education and outreach. Our mission is to provide youth with the opportunity to explore STEM through hands-on experiences and support. We achieve this through passion for robotics, commitment to outreach, and dedication to STEM education. Our journey is about the impact we make on our community and individuals. It's about using love of science and technology to impact the world with hard work and high expectations to transform the culture of our society.

Going forward, we plan to expand the reach of FIRST in Jeffco public schools and bring FIRST to the Middle East through STEM camps and meetings with potential investors. FIRST has already facilitated many internship opportunities, networking, and real-world skill development for 4499, and we want to continue this legacy. We are grateful for the knowledge and experiences we have gained and aim to transfer this to the next generation of future engineers.

Our team has grown from local to international outreach, and our students serve as youth leaders and trailblazers. We measure our success through the growth of our members, our impact on the community, and the stories we have created. We are proud of the change we have made in our community and know our journey will continue to impact us positively. Kilts may have originated in Scotland, but like the Highlanders, our unique style and global impact are boundless.