



The Highlanders FRC Team #4499 Impact Essay

The Highlanders (Team 4499) represent a dynamic assembly of 25 passionate students hailing from 6 schools, 6 cities, and 2 countries. Our roots lie in the community of Ft. Collins, Colorado, yet our impact extends far beyond, reaching people across the globe. Engaging with individuals beyond state borders, we've left a lasting impression in 7 countries over the past 12 years. This expansive reach is encapsulated by our guiding motto: "It's not about the game; it's about the journey." Beyond words, our team members embody this ethos, channeling it into their personal outreach efforts and continuous learning endeavors. The inspiring journey undertaken by 4499 mirrors the meticulous construction of a castle. Just as a castle requires planning, collaboration, and dedication from its architects, our team exhibits teamwork and perseverance.

Foundation

In the heart of our achievements, much like the stones that build a majestic castle, lies the essence of The Highlanders with our leadership and sustainability initiative. Just as each stone contributes to the strength and beauty of a castle's structure, each of our kilt-loving engineers forms a diverse yet strong foundation that guides our leadership model. Our leadership initiative mirrors the intricate weaving of a coat of arms, symbolizing not only diversity but also the collaboration of students, mentors, and sponsors. Together, we build a beautiful castle of leadership, skill development, and community engagement.

Fortifications

Looking further into the castle, there are our halls of success, including the Cycle of Success (COS) Initiative. This is the path our students tread to become future leaders and innovators, connecting with sponsors, such as Neaera Consulting, Lockheed Martin, and Woodward. These connections, like sturdy fortification walls, provide internships at esteemed companies like Tesla, Leidos, Xilinx, and Xion. The graduates, akin to the guardians of a castle, give back by providing funding and mentoring, ensuring the team's legacy continues to thrive. Our nonprofit started as a FIRST incubator in Northern Colorado and has now grown to support 6 FIRST teams, 281 students across Colorado, and hundreds of students worldwide.

Standards

The Highlanders have laid the foundation for the castle, through their involvement in FIRST. For 12 years, we ran FLL qualifiers, volunteered at FLLE expos, and hosted mentor and student workshops both in person and virtually. We impacted our community through FIRST by starting, funding, and mentoring a new FTC team to teach students and create a feeder program to ensure continued transition to our FRC team. 4499 students assisted 1 FLL, 8 FTC, and 18 FRC (2 rookie) teams. The robot demonstrations at community events are like grand banners, announcing the presence of a castle, captivating the audience, and inspiring questions from inquisitive minds, allowing students to be engaged by FIRST. Our support extends to other FIRST teams, offering assistance through weekly shop talks, drop-in shop days, mentor presentations, and workshops. The castle of community engagement stands tall, adorned with the banners of The Highlanders' involvement in parades, conferences, and other events like STEM nights, and demonstrations at local and global businesses including Sierra Space and Medtronic. Like the vibrant festivities within a castle, we engage with the community during Halloween events; passing out candy with creative robot costumes, sparking joy and curiosity. Last year we transformed our 2023 robot into a T-Rex to join our past creations of a dragon and ghostly critters. Through 6 Rocky the Robot books translated into 5 different languages and YouTube read-a-longs, we carry the castle's message to schools, tournaments, and other countries sharing the values of FIRST from a student perspective.

Drawbridge

Unlike most castles, 4499's drawbridge is always open allowing our students to venture into our local and international community; welcoming others to share ideas, shop space, and equipment. Locally, we are 1 of 2 teams working with CO FIRST to start a custom license plate initiative, we created and shared our sustainability initiative and Team Management initiative with mentors to teach team leadership and management across Colorado. Our partnership with CSU continues to grow as we run our robot camp to 50 students each summer. Our relationships with local schools like Loveland High School, Kinard Middle School, and afterschool clubs like Science Olympiad are becoming stronger as we share our team-made KILT kits - promoting STEM to over 132 students in the past three years. Internationally, 4499 has developed ties in Ecuador, France, Jordan, India, and Peru. 4499 jump-started the first FLLC program in Ecuador this year with our donation of robot kits and supplies to 20 students. With our continued support, we plan to help them register as an FLLC team and participate in FIRST Global. The impact of these outreach initiatives is akin to the castle gates opening to a world of possibilities, inspiring students of diverse backgrounds. We have gone to refugee camps, orphanages, community spaces, and schools where we can inspire kids of all ages and education. In Jordan, local leaders use our kits to continue to ignite STEM awareness and are working with officials to start FIRST programs within their communities. In Peru, France, and Ecuador, we donated STEM kits and

robot kits to local orphanages totaling over 200 kids. This summer we will run 6 STEM camps in India and start an FLL or FTC team.

The Courtyard

Stepping into the courtyard of STEM education, 4499 sees a bright new future emerging within its grounds, a Great Hall. This *Center of Excellence*, 4499, in partnership with our non-profit and mentors, is a dream coming true to build a hands-on STEM center for all to visit, use, and be introduced to FIRST, STEM, and the ethos of the Highlanders. The innovation center will house a common workshop, classrooms, FLL, FTC, and FRC fields. We are excited to announce that registration is open for our summer camps at this facility for this summer!

Collaboration

Collaboration within a castle is essential for sustaining a safe community and advanced skill development. In the summer of 2022, thirteen 4499 students participated in a summer internship program to develop an autonomous rover, MIRV, to reduce the danger to first responders on the highway in Virginia. In this partnership, with Neaera and VTTI, we were able to showcase our ability to provide real-world solutions through skills we learned on our FRC team like machining, CAD, computer vision, and artificial intelligence. Through these initiatives, we have brought in over \$15,000 to our program to help fund our team and outreach programs.

Castle Roads

4499's team initiatives include safety, team management, and how-to classes leveraging Google Classroom. This is like the roads from the castle going out to others, spreading knowledge between teams, and sharing ideas. This year, the Highlanders developed safety and team management courses containing learning materials, videos, and safety quizzes. To ensure a safe workshop, all students are trained in CPR, first aid, and basic tool usage. Assignments, such as team registration, food restriction documentation, 1-on-1 training, team code of conduct, and team commitment are examples of information we gather in our team management system. By sharing our sustainability and how-to classrooms, we help other teams develop a guide to a successful and sustainable model. Our course does this by having topics like "How to plan for current and future seasons" and "How to write a business plan and why." We inspire teams to make their plan for a better team with a high degree of sustainability for the future. Both of these courses have been adopted by Colorado *FIRST* as a prerequisite to grant applications within their organization.

Knights

The final touches on this castle are the commitment to STEM education and outreach, much like the Knights of the Round Table. 4499 works to expand FIRST in Jefferson County public schools and the state of Wyoming. In Wyoming, we hope to bring FIRST to their communities and school districts. 4499 students met with the policy advisor of the Wyoming governor's

office, and the director of WYDOT, to show how our program has benefited us, and how to implement new FIRST programs in the state of Wyoming.

Unity

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 experience and support. We achieve this through a passion for robotics, commitment to outreach, and dedication to STEM education. Our journey is about how we shape our community, individuals, other teams, sponsors, mentors, and alumni. It's about using the love of science and technology to impact the world with hard work and high expectations to transform the culture of our society. 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 influence on the community, and the lives we have changed. We are proud of the change we have made in our community and know our journey will continue to affect us positively. While castles might not be commonplace in Ft. Collins, the Highlanders are building their own, using their unique style, global impact, and dedication to FIRST. While all of us might be different stones, we all come together to build a beautiful castle with strong ties that will continue to build our community for years to come.