STEM FUTURES
THE LEADERSHIP & WORKFORCE ACADEMY FOR JROTC

CADET IMPACT REPORT 2025

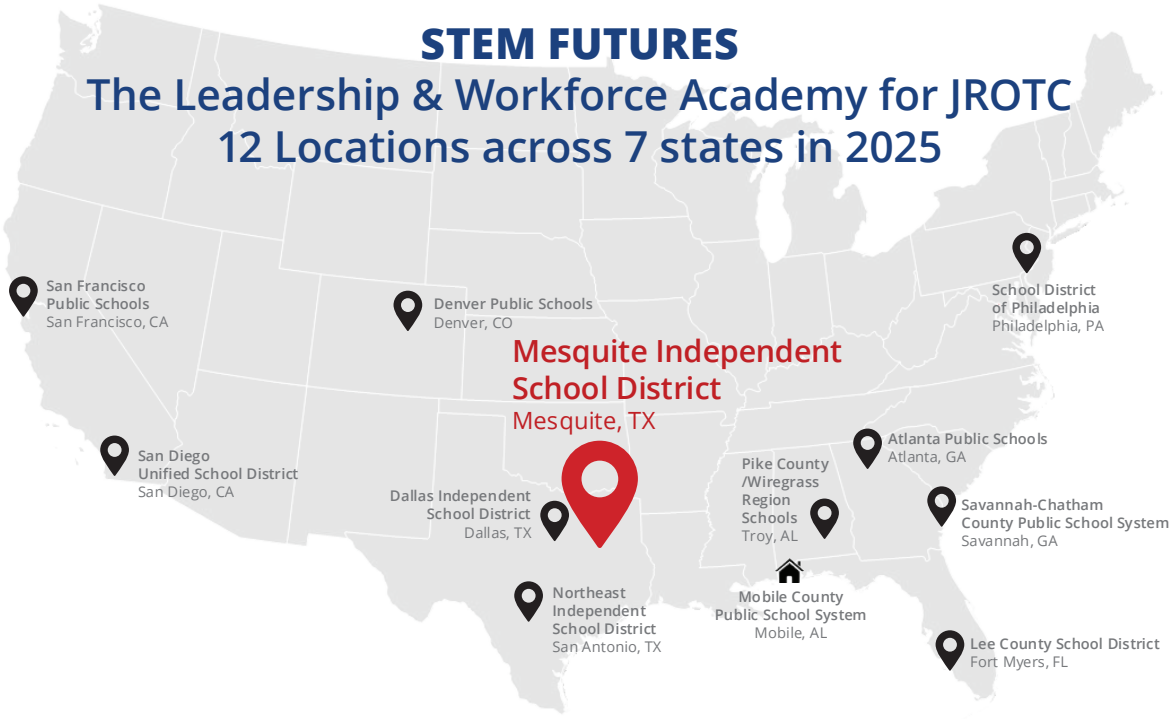
STEM FUTURES: The Leadership & Workforce Academy for JROTC is a week-long residential summer camp that helps meet today's workforce needs by engaging high school students—rising 9th-12th grade JROTC Cadets—in activities that open pathways to STEM learning and careers.

The Academy seeks to increase Cadets' awareness of local high-paying, in-demand STEM career opportunities and their understanding about what it takes to secure these jobs. To do this, the Academy integrates activities aimed at informing JROTC Cadets about STEM jobs, piquing their interest to pursue these jobs, giving them hands-on application of STEM concepts in a team setting, and developing 21st century workforce skills.

The 2025 Mesquite Academy took place at East Texas A&M University in Commerce, Texas. The focus of this Academy was on the advanced manufacturing industry and a related STEM-on-the-Ground curriculum in which Cadets designed, built, and tested remote-controlled multi-purpose robots and completed several missions, each with increasing complexity.

6 HIGH SCHOOLS | **73** CADETS

STEM FUTURES
The Leadership & Workforce Academy for JROTC
12 Locations across 7 states in 2025



INTEGRATED ACTIVITIES

- STEM Design Challenges
- Visits to Workplaces and Universities
- JROTC Cadet Leadership Challenges
- Inspirational Guest Speakers

How did Cadets respond to teamwork experiences?

I liked my team's ability to work together after making mistakes. If I had a coworker who had a different opinion, I would be able to remain open-minded and find a middle ground.

RISING 10TH GRADER, WEST MESQUITE HIGH SCHOOL
2025 MESQUITE ACADEMY

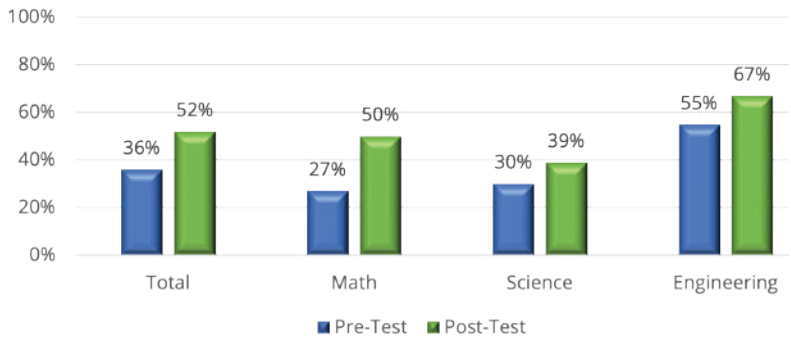
STEM Futures: The Leadership Academy for JROTC engaged Cadets in developing and valuing teamwork, communications, and leadership skills needed to be successful contributors and collaborators. Carefully structured activities designed to do this included:

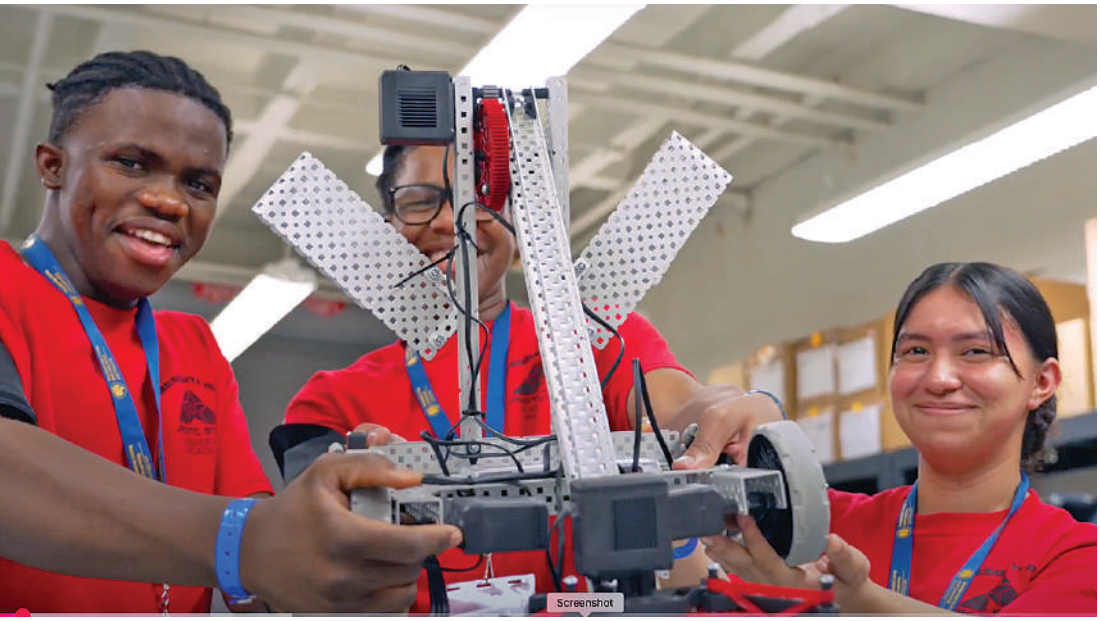
- Winning Colors® Personality Assessment
- Team Building Activities
- Enginnering Design Challenges
- JROTC Fitness Challenges and Sports Nights
- Team Poster Presentations

STEM-on-the-Ground Team Design Challenges

Cadets at the 2025 Mesquite Academy applied the concepts of simple and complex machines, gears and gear ratios, inverse relationships (lifting force versus speed), and the engineering design process during their team challenges for the advanced manufacturing-themed curriculum. Cadets used VEX Robotics kits to build and remotely control their robots, which included manipulators to lift and move objects and the ability to traverse different terrains. Cadets conducted trial and error analysis, under specified constraints, to meet criteria and presented the process and results to Academy leaders, peers, and visitors. Pre-and post-assessments showed that Cadets achieved statistically significant gains in STEM overall and in each content area.

2025 MESQUITE ACADEMY CADETS' CORRECT ANSWERS TO STEM CONTENT QUESTIONS





When we had an issue with our plow, I took more initiative and came up with an idea that both fixed the issue and added the extra counterweight we needed.

RISING 11TH GRADER
POTEET HIGH SCHOOL
2025 MESQUITE ACADEMY

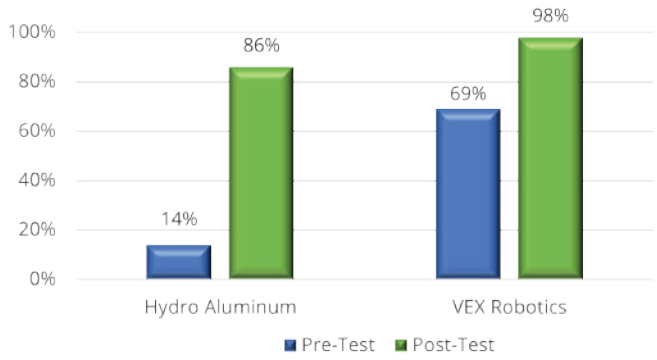
At Hydro Aluminum, I learned that recycled aluminum is better for the environment than pure raw aluminum. Chemistry is used to adjust the aluminum mix to meet customers' needs.

RISING 10TH GRADER, JOHN HORNE HIGH SCHOOL
2025 MESQUITE ACADEMY

Workplace Visits

To raise Cadets' awareness of how STEM is used in the advanced manufacturing industry, the 2025 Mesquite Academy arranged visits to Hydro Aluminum Recycling Plant and VEX Robotics. Cadets interacted with engineers, scientists, technicians, and other professionals who talked about their work, hiring requirements, traits and skills needed, training offered, and salaries for local, high-demand STEM jobs.

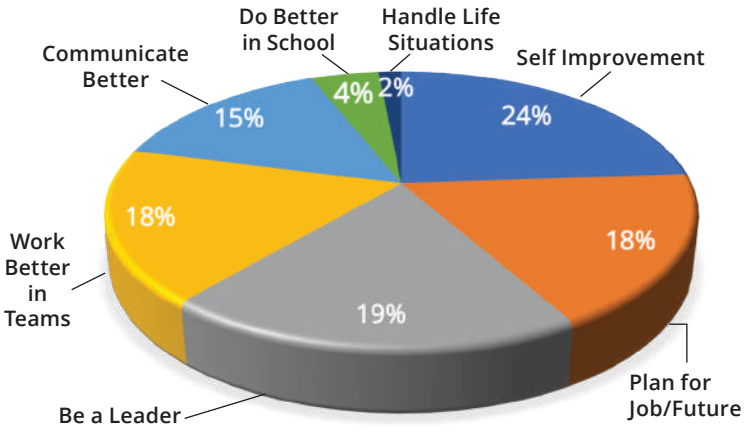
2025 MESQUITE ACADEMY CADETS ABLE TO DESCRIBE WORKPLACES VISITED



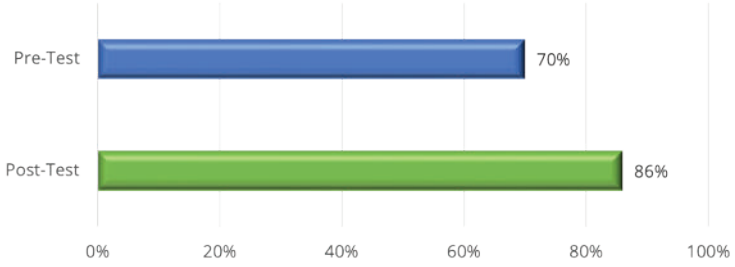
Educational Experiences

Cadets at the 2025 Mesquite Academy resided at East Texas A&M University (ETAMU) where they got a taste of campus life and learned about programs offered and admissions. Guest speakers shared inspirational accounts of their journeys and career paths, highlighting perseverance and a commitment to success. Speakers included Jacob Stahl, Draco engine team supporting NASA's Commercial Crew Program; R. Valerie Cochran, Reliability Manager at Smurfit Westrock; and ETAMU professors: Dr. Gerald Fudge, electrical engineering; Dr. Yuehua Wang, computer science and information systems; and Dr. Christian F. Hempelmann, computational linguistics, AI initiative, and semantic AI and creativity laboratory.

HOW WILL 2025 MESQUITE CADETS USE ACADEMY EXPERIENCES IN THE FUTURE?



2025 MESQUITE ACADEMY CADETS AWARE OF LOCAL, GOOD-PAYING STEM JOBS



Using STEM in the real world means mathematically challenging a hypothesis and testing it to see if it was correct.

RISING 11TH GRADER, MESQUITE HIGH SCHOOL
2025 MESQUITE ACADEMY

What are the CADETS Saying?

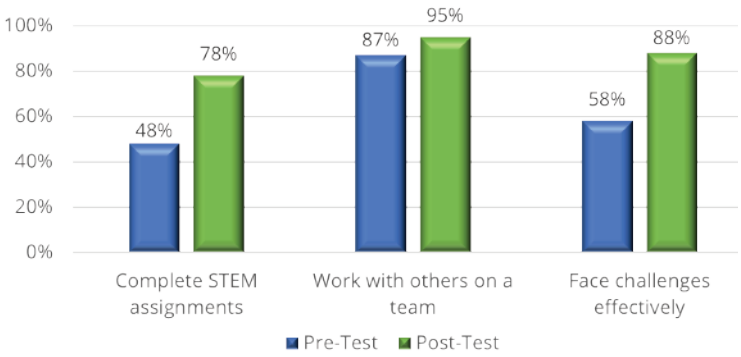
I learned the importance of communication between teammates and the power of teamwork. I also learned the importance of staying calm under pressure.

RISING 10TH GRADER, VANGUARD HIGH SCHOOL
2025 MESQUITE ACADEMY

JROTC Cadet Leadership Challenges

The foundation of the Academy lies in the JROTC culture and character education curriculum. Cadets who attended the Academy received additional exposure to that curriculum and culture by participating in JROTC Cadet Leadership Challenge (JCLC) activities, including drown-proof training, rock climbing, sporting events, and drill competition. Cadets consider JCLC activities a highlight of the camp that engages them physically while building personal confidence and team camaraderie. Combining JCLC activities and STEM design challenges resulted in linked experiences that helped build academic, team, and leadership skills and promoted self-improvement.

2025 MESQUITE ACADEMY CADETS' BELIEFS IN THEIR ABILITY TO...



Overall Conclusions

Based on the analysis of quantitative and qualitative data collected, the **2025 Mesquite STEM FUTURES: The Leadership & Workforce Academy for JROTC** increased Cadets' awareness of and interest in local STEM career opportunities and increased their confidence to pursue STEM learning and careers. Cadets made gains in math, science, engineering, and technology concepts, aided by hands-on application of those concepts, which increases the likelihood they will be successful in STEM courses and careers. Cadets gained skills in teamwork, leadership, communication, and other 21st century workforce skills and experienced growth in social skills, confidence, and productivity. All combined, the Academy provided experiences that opened pathways to STEM learning and careers.

Failure is important to success because it shows our perseverance and will power to push through.

RISING 10TH GRADER, WEST MESQUTIE HIGH SCHOOL
2025 MESQUITE ACADEMY

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