Dedicated to our military volunteers...

In this 2018 DoD STARBASE Annual Report, we celebrate our 25th Anniversary of operation.

We could not have made it this far without all the military volunteers who have supported our STEM initiatives along the way. These dedicated personnel have served as presenters, STARBASE 2.0 club mentors, board members, advisors, tour guides, instructors and a wide variety of other roles that have helped make DoD STARBASE the program it is today.

From humble beginnings as a one-site program in Michigan, to joining the ranks of the Department of Defense (DoD) in FY 1993, DoD STARBASE now extends coast-to-coast, north-to-south, with 66 locations throughout the United States and Puerto Rico – all supported by Active Duty, Reserve and National Guard volunteers.

We sincerely thank these positive role models for their tireless efforts and service to the DoD STARBASE program, especially for helping us inspire and motivate students along the STEM pathway of the future. This report is dedicated to you with our gratitude.
Barbara Koscak won The A. Scott Crossfield Award and used that award money to pay for a summer camp at Selfridge Air National Guard Base called “Project Stars” (later changed to STARBASE) while writing an additional grant for WK Kellogg. This camp proved to Kellogg that kids needed more hands-on math and science.

WK Kellogg Grant awarded to Mt. Clemens Schools and Selfridge ANGB to start the full-time STARBASE program.

Barbara Koscak met with Brigadier General David Arendts for the first time to discuss a hands-on math and science program.

FY 1993, U.S. Congress appropriates funds to pilot the first official DoD STARBASE Programs in 7 states.

DoD STARBASE adds the Navy to the list of military affiliations starting with DoD STARBASE Atlantis-Pensacola.

Michigan Senator and Chair of the Senate Armed Service Committee, Carl Levin, visits the students and new facility at Selfridge Air National Guard Base. Senator Levin continued to support the DoD STARBASE program throughout his career and remains active today.

Oklahoma STARBASE 2.0 after school team at the White House Science Fair with Bill Nye the Science Guy.

The first Active Duty Air Force DoD STARBASE opened at Kirtland Air Force Base, New Mexico.

Timeline of Events

FY 1993, U.S. Congress appropriates funds to pilot the first official DoD STARBASE Programs in 7 states.
Kansas Senator Elaine Bowers joins the Kansas STARBASE Inc. Foundation to support DoD STARBASE and the students of Kansas.

DoD STARBASE Kansas grows to five locations including Wichita, Topeka, Kansas City, Salina and Manhattan.

Governors from Minnesota and Kansas are among the listed public officials to recognize and value DoD STARBASE through proclamations.

DoD STARBASE Oklahoma receives over $28,000 from the Oklahoma Aeronautics Commission for their STEM education initiatives. Rockets were purchased for the Muskogee Summer Camp.

Inspired by his DoD STARBASE Atlantis-Pensacola experiences, graduate and Naval officer, LTJG Westin Giles, was awarded a National NROTC scholarship to attend Florida Agricultural and Mechanical University.

DoD STARBASE receives the Air Force Association (AFA) Chairman’s Award for Aerospace Education Achievement for sustained support to STEM programs.

DoD STARBASE Charleston becomes the first DoD sponsored team to compete in the national Team America Rocketry Challenge (TARC).

DoD STARBASE Charleston partners with area Fortune 500 Companies to promote STEM Career Awareness.

DoD STARBASE Minnesota partners with area Fortune 500 Companies to promote STEM Career Awareness.
DoD STARBASE celebrates a milestone by serving more than 1 million students since 1993.

Woodall Students from DoD STARBASE Oklahoma 2.0 Program participate in the White House Science Fair in Washington, D.C.

The DoD STARBASE Wyoming 2.0 teams win first and second place in the FIRST Tech Challenge as part of the Great Cheyenne Bed Race.

US Air Force Chief of Staff, General David Goldfein, greets DoD STARBASE Swamp Fox 5th graders from Brookland-Cayce Grammar School #1 during a visit to the 169th Fighter Wing at McEntire Joint National Guard.

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Vision and Mission Statements of DoD STARBASE

Vision Statement
To be the premier Department of Defense youth outreach program for raising the interest in learning and improving the knowledge and skills of our nation’s at risk youth so that we may develop a highly educated and skilled American workforce who can meet the advanced technological requirements of the Department of Defense.

Mission Statement
To expose our nation’s youth to the technological environments and positive civilian and military role models found on Active, Guard, and Reserve military bases and installations, nurture a winning network of collaborators, and build mutual loyalty within our communities, by providing 25 hours of exemplary hands-on instruction and activities that meet or exceed the National Standards.

“LOVE this program! You could really see the “light bulb” turn on for many of these kids during the hands-on activities. We had many conversations over the last few weeks outside of school. I was not sure what to expect, but DoD STARBASE surpassed any expectations I had.”

– ALORA MAYER, PARENT OF A STUDENT AT FARLEY ELEMENTARY SCHOOL ATTENDING STARBASE TOPEKA
DoD STARBASE Curriculum

Physics and Chemistry
A. Motion and Force
B. Fluid Mechanics
C. Building Blocks of Matter

Energy
A. Energy Fundamentals

Technology
A. Current and Emerging Technologies
B. Applying Technology

Engineering
A. Engineering Design Process (EDP)
B. 3-D Computer-Aided Design

Mathematics Operations and Applications
A. Numbers and Number Relationships
B. Measurement
C. Geometry
D. Data Analysis

Science, Technology, Engineering and Mathematics (STEM) Careers
A. STEM Careers on Military Facilities
B. Personal Investigations
DoD STARBASE at a Glance

- **66** Number of DoD STARBASE locations in 33 states and territories
- **78** Number of DoD STARBASE 2.0 Outreach programs in 22 states
- **1,203,723** Number of students since 1993
- **93,133** Number of students served in 2018
- **$27,534,411** Program operating budget
- **$367,500** Median operating cost per location
“I see DoD STARBASE as the igniter to a young person’s dreams toward a fulfilling career in science and technology that encompasses a passion they may otherwise not have known. It is up to the men and women of DoD STARBASE programs to reach as many students as possible, as well as build follow-on bridges that continue to fuel their ambition. So, we as DoD STARBASE supporters, cannot rest as simple initiators. We need to see to it that our future scientists, mathematicians, explorers, pilots, astronauts, health care professionals, engineers, and cyber technologists have continued pathways to succeed no matter their beginnings.”

– MAJ GEN DAVE HAMLAR, MD DDS, STARBASE MINNESOTA - ST. PAUL
Advances in science, technology, engineering, and mathematics (STEM) determine our nation’s capacity to produce better and smarter products, advance health care, create cleaner and more efficient domestic energy sources, preserve the environment, strengthen the economy, and most importantly – protect our national security. This dominance is being threatened and there is an urgent need to establish unparalleled student achievement in STEM curricula at every level of education. From the elementary-age student to the young scholars in our nation’s high school advanced placement classes and beyond, we must work to make STEM education and careers a rewarding and attractive option to develop talent and increase the prospective return on investment. American defense and homeland security industries face serious challenges in filling some of the most critical technical jobs in our country, and we are not producing enough graduates trained in STEM who qualify for the required security clearances. The problem presents a serious risk for our national security over the next decade as experienced STEM workers continue to retire without an employable talent pool or pipeline to replace them.

To ensure a literate citizenry that can compete in the global market place and meet our own employment requirements, the DoD seeks to foster strong relationships with future scientists and engineers as well as to engage teachers in transforming STEM education. The DoD STARBASE program is part of that solution as it captures students’ interest in STEM at the elementary and middle school levels, a critical time to intervene and prevent students from losing interest in STEM. At DoD STARBASE, students’ awareness of potential careers in these fields increases as they discover jobs that they had never even considered. They learn the requirements for these challenging careers and why studying and selecting courses in STEM is so important to achieve their goals. Their interests and knowledge in STEM are critical to our nation’s future in building and sustaining a highly educated and skilled workforce capable of meeting the advanced technological requirements of the Department of Defense.

The DoD STARBASE program directly supports the Department of Defense Science, Technology, Engineering and Mathematics (STEM) FY2016 - FY2020 Strategic Plan’s vision, mission and goals by serving as a foundational awareness and workforce development program that highlights STEM awareness as a core component. It is one of the primary tools that the DoD has in its inventory to contribute to the ongoing, renewed national
effort intended to close the serious achievement gap with competing nations and to perpetuate our long-term security and prosperity.

DoD STARBASE has a tremendous impact on America’s youth nationwide as it improves their learning experience and desire to pursue careers in STEM. Evidence based evaluations of DoD STARBASE participants and their teachers show significant improvement in the students’ understanding, interest, and ability in math and science which has led to increased confidence and enthusiasm in further pursuing their STEM education. This may also impact their decisions about college enrollment as well as interest level in STEM careers and technology.

DoD STARBASE is also an outstanding outreach program. It strengthens the relationships between the military, the community (including industrial and business partners) and the school districts, while raising the interest of traditionally underrepresented students in STEM education programs and pursuit of such careers. With 66 programs across the United States and Puerto Rico, DoD STARBASE program directors and their respective senior military members are able to work directly with local and state leaders to execute our DoD STEM Strategy while addressing their educational gaps in STEM using a proven curriculum.

Since its inception in 1993, the DoD STARBASE program has served over 1,200,000 students from over 400 school districts in 32 states and Puerto Rico. The scope of STEM engagement at DoD STARBASE is vast as there are many avenues designed to increase student involvement and interest in STEM, inform them of STEM’s value in their lives, or positively influence the perception of their ability to participate in STEM. This annual report provides data from regular and rigorous evaluations as well as evidence of long-term outcomes through testimony and reports of what former DoD STARBASE students have accomplished and what they are doing today. It highlights the linkages and partnerships that exist between DoD STARBASE, public school districts, and non-governmental organizations. The report also discusses the approaches taken by program directors to strengthen citizen science initiatives in their communities and to create an authentic STEM enrichment experience for participating students.

Through continued annual analysis, evaluations and updates, DoD STARBASE can assist the DoD in achieving its goal of enhancing the efficiency and effectiveness of STEM education initiatives. As a foundational STEM enrichment program, DoD STARBASE has the great potential to increase the quantity and quality of scientists, technologists, engineers, and mathematicians graduating from our education system with an interest in supporting our national security.

“Engaging innovating young minds is the standard at Austin DoD STARBASE! Thank you for allowing our Soldiers and Airmen at the Texas Counterdrug Task Force to come and speak to the kids each week while classes commence. We are excited to share our experiences and skills in the military and to show how they are rooted to science, technology, engineering and math (STEM) in our everyday life.”

— SFC JESSICA CABRERA, TEXAS STARBASE – AUSTIN
A letter from DoD STARBASE Florida Graduate, Samantha Bendon

Growing up as a young girl in Northeast Florida, I was interested in dogs and horses. One day my dad told me of his friend whose children were involved in a program called DoD STARBASE. Now that sounded interesting, and I, too, would be able to attend. Little did I know as I walked into STARBASE, seeing the Bernoulli Principle and aviation posters on the wall and the model airplanes hanging from the ceiling, how much of a life changing direction STARBASE would take me in. STEM was not a career path I would have considered following before, but DoD STARBASE brought it to life.

DoD STARBASE exposed me to the joy of science through practical application. I was actually building rockets and watching them blast into the sky. I could now see how they related to the real-life NASA rockets. Through DoD STARBASE, I was given the opportunity to see the F-15 fighter jet in person at the 125th Fighter Wing in Jacksonville, Florida. Both experiences would have sounded surreal to me before STARBASE. It made such an impact that today, I am a proud member of that larger-than-life 125th Fighter Wing.

At 14, I joined the Civil Air Patrol and learned more about aerospace and leadership. I was even promoted to the rank of Cadet Major. Me, a Cadet Major? But that was just the beginning. I was able to receive “O-Flights” (Orientation Flights) where I learned the basics of flight controls in a Cessna 172. This was not enough; I wanted to be the pilot in control. This became my new passion. I applied to the James C. Ray Aviation Scholarship Foundation, where I was awarded the opportunity to achieve

“STEM was not a career path I would have considered following before, but DoD STARBASE brought it to life.”

- SAMANTHA BENDON
this dream. I will never forget the moment my instructor climbed out of the plane and told me I was ready to fly alone.

Keeping the theme of STEM alive in my career choices, I became a mechanic on the F-15 weapons system at the 125th Fighter Wing in the Florida Air National Guard (FANG) as an enlisted airman in 2016. I now hold the rank of Senior Airman (E-4) and look forward to the future of many more years in service to my country.

Today, because of DoD STARBASE, my interest in STEM has not faded. I am now an EMT working for a private ambulance company, gaining new experiences by serving my community in the medical field every day. But this still was not enough. As part of my EMT training, I assisted the local fire department where I realized there was more that I had to do. There was a bigger picture and I wanted to be a firefighter paramedic—a first responder. I am now halfway through fire school, with graduation on the horizon.

As I look back at that little girl who walked into DoD STARBASE for the first time, I am amazed to think of how DoD STARBASE has shaped my life. I was not alone that day nor am I an anomaly. If DoD STARBASE can influence a young girl in Northeast Florida whose interests were dogs and horses, how much more can such a program continue to shape the youth of today?
A Letter from DoD STARBASE MCAS Beaufort Graduate, Celeste Taylor, “Mrs. Return”

As a 4th grader from Beaufort Elementary, in November 2001 I had the opportunity to attend STARBASE MCAS Beaufort. Having older friends and cousins, I remember STARBASE being the most talked about field trip in elementary school. I distinctively remember three things about my experience at STARBASE: the infamous rockets that we got to launch on Friday, going into the computer lab to “fly” jets using computer software, and the impact that STARBASE had on the love I have for science.

I believe STARBASE is the reason I have the passion for science today. I attended and graduated from South Carolina State University with a Bachelor of Science in Biology and a minor in chemistry. After graduating, I moved back home where I started teaching Anatomy and Physiology labs at a local community college. I taught there for three years until I stumbled across a job ad for STARBASE. I was overcome with so many memories, I had to apply! I am so grateful that I applied because teaching here at STARBASE has been amazing. To be able to see the same amazement and joy in the student's eyes that I had when attending STARBASE is not only fulfilling but also rewarding. Going through the STARBASE program at 9 years old and being able to return and teach allows me the opportunity to do what I love and be a role model to the students who attend. At the start of each session, I share with the students that when I was in 4th grade I was once where they are, sitting at a table intrigued and eager about the days to come. I hope that every student who comes through my classroom at STARBASE takes the information they have learned here and allows it to be a seed or a foundation to STEM and what STEM has to offer in the world. Because had I not, I wouldn’t be where I am today.
Top: Celeste Taylor, now a DoD STARBASE Instructor at MCAS Beaufort, explains how chromatography can be used in the crime scene investigation. Bottom: Celeste Taylor participates in DoD STARBASE at MCAS Beaufort.
A Letter from Major General David S. Baldwin, The Adjutant General of California

The California National Guard has hosted the DoD STARBASE program since 1993 and we are very proud that this program has become a pillar of our statewide educational outreach efforts. As the Adjutant General of California, I have observed how the DoD STARBASE program can ignite a student’s interest in STEM (Science, Technology, Engineering, and Math) education.

DoD STARBASE lessons introduce young minds to the concepts of scientific thinking, problem solving, creativity, and the importance of collaboration and teamwork. These lessons also provide students opportunities to see how concepts relate to life in an effort to spark a passion for a future career in a STEM field.

As a nation, we have learned how important it is to introduce STEM education in elementary school as students are developing foundational education habits. Students with a strong foundation in STEM education will go on to play an integral role in our nation’s global competitiveness and economic stability.

With locations in Sacramento and Los Alamitos, our two DoD STARBASE programs have combined to serve more than 65,000 students over the past 25 years. Our very talented teachers provide hands-on and minds-on activities for their students. Making math and science both fun and interesting helps their students to do more than just learn.

In California, we will continue to embrace this program and expand our outreach efforts to other underserved and underrepresented communities throughout the state. Science, technology, engineering, and math: the four core subjects that make up STEM education are finally getting the attention they deserve.

Finally, I would like to extend our thanks and appreciation to the DoD STARBASE Congressional Caucus for their leadership and dedication to our nation’s youth.

Sincerely,

DAVID S. BALDWIN
Major General
The Adjutant General of California
A Letter from Major General Lee Tafanelli, The Adjutant General of Kansas

Educating and preparing our youth to become innovators, researchers, teachers, and leaders with the potential to change the world and solve the challenges that face our nation is one of the many reasons I support the Department of Defense STARBASE program in the state of Kansas.

Since 1993, the Kansas STARBASE program has helped more than 80,000 students from 4th through 6th grades apply the principles of Science, Technology, Engineering and Math (STEM) to daily life through the unique “hands-on, minds-on” approach to learning. The STARBASE program aligns with national and state educational standards in math and science and is designed to augment what schools with limited resources are able to offer their students.

With five locations in Kansas City, Manhattan, Salina, Topeka, and Wichita, the state of Kansas has the largest number of STARBASE programs in the United States. Students across the state of Kansas interact with positive role models from the Air and Army National Guards. Students climb aboard a UH-60 Blackhawk, tour a KC-135 Stratotanker, and explore HET vehicles as military volunteers bring real world learning to the STARBASE classroom.

Summer classes are held at each of the five locations with an additional outreach week in western Kansas at Ft. Hays State University. Partnerships between local universities allow classroom teachers to attend the STARBASE summer programs to obtain credit for continuing education.

I look forward to seeing the Kansas STARBASE program continue to empower students from all backgrounds as they contemplate career choices and begin their future journey to become our next generation of leaders in this country.

LEE E. TAFANELLI
Major General, KSNG
The Adjutant General
A Letter from Major General Donald P. Dunbar, The Adjutant General of Wisconsin & Chairman of the Board, National Guard Association of the United States

Throughout our nation’s history, the National Guard has leveraged the strength of its unique skill sets when asked to confront pressing and consequential needs in communities across the nation.

The STARBASE Program is an innovative example of how the National Guard is taking action to address a pressing and consequential need with long-term ramifications. While STARBASE is a Department of Defense program, the National Guard is the steward, bringing this hands-on, minds-on initiative to improve student appreciation and understanding of science, technology, engineering and math into community schools across the nation.

These four components imply a knowledge base and skill set that matches up well with military and civilian needs now and moving forward – our technology is rapidly advancing, and we need citizens highly proficient in science, technology, engineering and mathematics to help us maintain a competitive advantage on the battlefield. But STEM is more than figures, formulas and gadgets – according to the Wisconsin Department of Public Instruction, it’s a metadiscipline that can be used to solve unique problems creatively and collaboratively. In other words, it’s an interdisciplinary mindset or philosophy applied to problem-solving. Like diversity, STEM increases our capabilities and expands our experience solving problems.

Beyond the military, these skills are desperately needed in the private sector. According to the Education Commission of the States, business leaders are struggling to find STEM talent to remain competitive. And part of the problem is that certain pockets within our student population are not exposed to the STEM experience and challenging content that can prepare them for college and the workforce.

The community is paying attention to the work that STARBASE Wisconsin is doing. In March 2018, the Wisconsin Technology and Engineering Education Association presented STARBASE Wisconsin with a Special Recognition Award for contributions and service to technology education. In November 2017, the Metropolitan Milwaukee Alliance of Black School Educators presented STARBASE Wisconsin with its Community Agency of the Year Award for addressing community needs by developing exceptional programs that support youth and their families. In October 2016 STARBASE Wisconsin received the Partnership in STEM Programming award for its partnership with Milwaukee Public Schools providing a hands-on STEM program for 5th-grade students at the STEMMY Awards in Milwaukee.

I am proud that the Wisconsin National Guard has been involved with STARBASE since opening our schoolhouse in 2012, providing more than 6,100 fifth-grade students in the Milwaukee area a compelling, hands-on method of understanding how science, technology, engineering and math work through hands-on projects and experiments. It may seem like a small program, but it has a big impact in the Milwaukee Public Schools. In partnership with STARBASE programs in civilian communities and military schools across the nation, we can ignite the imagination of young students to develop technical skills for civilian and military opportunities.

DONALD P. DUNBAR
Major General, Wisconsin National Guard
The Adjutant General
STARBASE Wisconsin Honored with Educational Awards

Organizations throughout the State of Wisconsin are taking note of the contributions made by DoD STARBASE Wisconsin. STARBASE Wisconsin, which is coordinated by Director John Puttre, serves students from the greater Milwaukee area.

In November 2017, STARBASE Wisconsin was recognized by the Metropolitan Milwaukee Alliance of Black School Educators (MMABSE). Each year, the organization presents a “Community Agency of the Year Service Award” honoring an organization that has demonstrated a major commitment to addressing community needs through time, actions, talents, and dedication. That commitment must be demonstrated through the development of exceptional programs that support youth and their families. STARBASE Wisconsin received MMABSE’s 2017 Community Agency of the Year Service Award at a special ceremony. They were nominated by Marvin E. Pratt Elementary School based on their commitment to students and the following accomplishments:

• Annually, the three-person DoD STARBASE Wisconsin staff partners with 35 Milwaukee Public Schools to provide a 25-hour, hands-on Science, Technology, Engineering, and Math experience for students of which 63 percent of the student population are youth of African descent.
• STARBASE Wisconsin also supports families by developing afterschool programs and teaching at outreach programs during out-of-school hours that youth can attend with their parents or siblings. This includes the Boy Scout of America’s STEM Merit Badge Sessions and 128th Air Refueling Wing’s Military Family/Wingman Day.

In March of 2018, members, teachers and supporters of the Science, Technology, Engineering, and Math (STEM) community from around the State of Wisconsin gathered at the Chula Vista Resort for the 2018 Wisconsin Technology Education Association Conference. During the awards presentation, STARBASE Wisconsin was presented with their “Special Recognition Award” for their continued contribution and service to technology education. STARBASE Wisconsin was recognized for providing Milwaukee youth with a 25-hour STEM concentrated curriculum to increase their knowledge in STEM. Fifth grade students in Milwaukee public, choice, and charter schools spend five weeks exploring the world of the sciences through hands-on activities and experiments, technology projects, and interaction with military and civilian professionals with careers in STEM fields.

“ In partnership with STARBASE programs in civilian communities and military schools across the nation, we can ignite the imagination of young students to develop technical skills for civilian and military opportunities.”

- DONALD P. DUNBAR, MAJOR GENERAL, WISCONSIN NATIONAL GUARD, THE ADJUTANT GENERAL
“Where would we be without our mentors?” That is a question that frequently echoes in the minds of DoD STARBASE Martinsburg’s Director Sherra Triggs and 2.0 Program Coordinator Ashley Spies regarding their afterschool STARBASE 2.0 program.

Their pilot program began with South Middle School, part of the Berkeley County Public School system, in the fall of 2012 with 15 students and a handful of military mentors from the 167th Airlift Wing supporting the STARBASE efforts to expose and engage students in STEM-based afterschool opportunities. TSgt Matthew Meyercheck, one of the original mentors, remarked on the program: “The STARBASE 2.0 program is a great way for students to build confidence, as well as be part of a team. I wish I had a program like this when I was in school.”

Six years later, the Martinsburg STARBASE 2.0 program continues to succeed, grow and steadily attract more interest. They have now expanded the program to serve three host schools: South, Mountain Ridge and Hedgesville Middle School. And the number of mentors has grown as well. Approximately 75 military mentors are now enthusiastically embedded in the STARBASE 2.0 program.

“\n\nThe STARBASE 2.0 program really fosters creativity and encourages analytical thinking of these students.”

-TSgt ALAN ROMERO
Left: using PTC Creo, a Computer Aided Design (CAD) program, students work alongside MSgt Phillip Creek to design a product.

Right: TSgt James Turner assists a student while conducting the “Save Sam” engineering challenge.

operation. “It’s great to see the students’ creativity and I personally enjoy witnessing their excitement in solving each week’s activity,” remarked SMSgt John Ratcliffe. Mentor TSgt Alan Romero also endorsed the program stating, “The STARBASE 2.0 program really fosters creativity and encourages analytical thinking of these students.”

It is the dedication from the 167th Airlift Wing and its partnership with the Martinsburg STARBASE 2.0 program that still allows middle school aged students the opportunity to further develop an interest in STEM related fields. They continue to offer their time, leadership and guidance to participating students to help complete a variety of complex engineering design challenges. This includes LEGO robotics, rocketry, computer aided design (CAD) projects, Rube Goldberg machines, RC vehicle course design challenge and much more. “Our extensive support from our military members is the primary reason we have been so successful with these adolescent students” said Director Triggs. “We couldn’t do it without them!”

STARBASE 2.0 teams design and build obstacles using scrap materials to later be used in an RC vehicle course challenge.
Caterpillar Engineers Team Up with STARBASE Rapid City 2.0

What’s the second-best thing to being a student in the DoD STARBASE 2.0 after-school program in Rapid City, South Dakota?

A team of Caterpillar Engineers found out that it’s working with the kids and getting to instruct part of the program itself! Each spring for the past two years, this lucky group of engineers has shared their expertise with willing STARBASE 2.0 students. William Barnes, Jacob Brown, Matt Bunge, and Tony Fischer, who work as mechanical design engineers at Caterpillar’s Black Hills Engineering Design Center, make up the instructional team and seem to have as much fun as the kids! At CAT, they design components and systems that could be used in anything from the next generation of Caterpillar engines to a new hybrid excavator.

The CAT engineers teamed up with the STARBASE Rapid City director and instructors to develop and implement a curriculum where they helped students apply the entire engineering design process in the creation of CO2 cartridge race cars. The students began by brainstorming their car design while learning about important design aspects such as aerodynamics and weight considerations used in automotive design. Re-designs were worked in the 3D virtual world using CAD to tweak their designs and ensure all constraints were met. Finally, their CAD designs were brought to “real life” by printing each car using a 3-D printer. At long last, the “rubber met the road” when they got to race their cars on the CO2 dragstrip and compete against their classmates to see who would bring home the checkered flag.

Left: STARBASE Rapid City Instructor, Mike McDaniel, helping West Middle School 2.0 Club members get their dragsters locked in and loaded up for their final race.

Below: West Middle School STARBASE 2.0 Club on CO2 Dragster Race Day.
“We feel that the nature of this fun but challenging ‘hands on’ method of teaching STEM topics provides a very stimulating and effective learning environment for tomorrow’s generation of engineers, scientists, and leaders. There are few more rewarding experiences than seeing a student have that ‘ah-ha’ moment when they apply something you have taught them to create something awesome.” said Tony Fischer. Fischer also volunteers as a member of the STARBASE of South Dakota Board of Directors.

Even though the number of students in the STARBASE 2.0 race car engineering class is just a drop in the bucket of the total number of at risk and under-represented students that STARBASE SD serves on a day-to-day basis, the engineers representing Caterpillar are pleased to work with an organization such as STARBASE whose mission is to make a positive impact in the lives of thousands of children in South Dakota and across the United States each school year.

CAT engineer Matt Bunge probably summed it up best. “It is a pleasure to partner with STARBASE to educate the next generation of leaders. Opportunities like STARBASE never used to exist. Being able to leverage industrial technical knowledge to provide the next generation better opportunities in STEM is definitely something worth supporting!”

“There are few more rewarding experiences than seeing a student have that ‘ah-ha’ moment when they apply something you have taught them to create something awesome.”

- TONY FISCHER
A Letter from Dr. Michael Amolins, Director of Curriculum, Assessment, and Federal Programs, Harrisburg School District

To this day, my parents continue to live in the same home I grew up in – a neighborhood in which having two parents at home was a rare thing to come by. Our area of town was not known for high economic status, low crime rates, or strong community support. What it was known for, however, was an incredibly strong and supportive school system in Hawthorne Elementary — a beacon of light shining through adversity and one of the original sites served by the DoD STARBASE in South Dakota. In fact, I was one of the very first students to participate in this program almost a quarter century ago. DoD STARBASE was one of the first experiences in which my passion for science had the opportunity to thrive. I remember learning about Newton’s Laws, launching pop bottle rockets, sitting in the cockpit of a flight simulator, and getting to ride around in the back of an Army Humvee. It was life changing – I knew that this was something I wanted to do for the rest of my life.

As I grew older, I continued to pursue my passion of science and engineering, becoming heavily involved in various modes of research, from chemical engineering and environmental studies to ultimately pursuing degrees in both medicinal chemistry/pharmaceutical design and education. My sense of curiosity never diminished after DoD STARBASE, and I continued to find inspiration in the world around me. My passion went beyond the laboratory and, two graduate degrees later, ultimately brought me back to the classroom where I had the opportunity to share those experiences with the next generation of STEM professionals. For the past ten years, I have maintained a career in both the school and laboratory settings, continuing to educate and mold young minds as a Curriculum Director and Title I Program Director in the Harrisburg School District (Harrisburg, SD) while also pursuing research interests in both the academic (Augustana University - Sioux Falls, SD) and private (Sanford Research - Sioux Falls, SD) sectors.

For the past two years I have been proud to give back to STARBASE South Dakota as a Board Advisor. It has been an honor and a privilege to work with young learners, contribute to the program in various ways, and to ensure its continued success and sustainability by coming full circle to utilize the skills I obtained as a DoD STARBASE student in order to provide community connections and support for the benefit of the program. I look forward to many more years of serving this program and to making a difference in the lives of young learners throughout the state of South Dakota and our nation.

DR. MICHAEL AMOLINS
Director of Curriculum, Assessment, and Federal Programs
Harrisburg School District – Harrisburg, SD
“All of the activities and experiments allowed my students to apply what they were learning, use critical thinking skills, and have fun in the process. Our least enjoyable part of the program was when our week ended.”

– CARLEY BARNETT, EDUCATOR AT PARADISE ELEMENTARY SCHOOL, ATTENDING PELICAN STATE STARBASE
Hard Work, Dedication, and Love of Learning Leads to an Opportunity of a Lifetime for Utah Students

At Hill Air Force Base (AFB), the STARBASE Hill - Screaming Eagles after school 2.0 Program with DaVinci Academy of Science and the Arts began in 2016-17. At that time, the combined junior and senior high school program chose rocketry as one of their major focuses because of their interest in aerospace and the simple fact that model rocketry is a blast... so to speak! And with a mentor from the Hill engineering work force, the team was able to qualify for Team American Rocketry Challenge (TARC) national competition near Washington, D.C.

The team, comprised of 10th graders Sam Makin and Janelle Preston along with 9th graders Audrey Joyce and Isaac Solario, stuck it out through the first year’s steep learning curve and accompanying trial and errors, frustrations of team building and build failures to form a strong core TARC team. Their dedication and hard work definitely paid off because competing in TARC Nationals was an opportunity of a lifetime. Sam Makin stated that he joined TARC because he wanted an opportunity to explore STEM fields. “I didn’t realize the learning experience I would get. We custom made parts. I want to explore engineering and aeronautics now. The experience at TARC nationals was awesome, but now I realize wind and temperature affect rockets. I am working on programming using Arduino software to better control our altimeter to be more accurate.”

Three of the four students had never been to Washington, D.C. and the overall experience was described only as “awesome.” They were thrilled to participate in the “Rockets on the Hill” event where they could meet other teams and see their designs. They also had the bonus of an impromptu meeting with Utah Senator Mike Lee where they told him about their TARC experience and asked for his support of their program. They got a private tour of the Capitol provided by one of Lee’s aides. Other highlights included going to the Smithsonian National Air and Space Museum on the National Mall and visiting the museum’s Udvar-Hazy Center in Virginia. Their mentor, Matt Doncheski, acted as their private tour guide throughout the museums.

DaVinci Academy of Science and the Arts is an inner-city school that is both economically disadvantaged and a Title I school located in Ogden, Utah. DaVinci participates in both the traditional DoD STARBASE program as well as the STARBASE 2.0 after school initiative. According to Deb Neal, DaVinci STEM Director, the partnership with STARBASE Hill - Screaming Eagles academy has helped facilitate DaVinci becoming a STEM affiliated school. They are now recognized as a Gold status STEM certified school through the Utah STEM Action Center which benefits all DaVinci students. Ms. Neal said that the largest impact of the STARBASE 2.0 TARC experience was that the students were “taught real-time about the engineering design process and team work: the collaboration process by majority consent, group problem solving and the real-life application of working together like real engineers.” She feels this program models for her students what it would be like in the work force. She also had high praise of the mentorship focus.
“Mr. Doncheski’s youth and experience, education in mechanical engineering, and personal interest in rocketry made him invaluable as a role model” she said. “As a mentor he shared with the students that not only did he participate on a TARC team when he was in high school, but he has also worked with SpaceX, ATK, along with his current work at Hill AFB. This showed the students the possibility for their future in STEM careers.”

Though the DaVinci TARC team did not qualify for the finals in 2018, it did not dampen their enthusiasm. They are back to the drawing board, working as hard as ever and even more determined to qualify in 2019 where the finals, and a return trip to Washington, D.C. await them.
STARBASE Oregon – Kingsley Addresses the National Pilot Shortage with a Summer Aviation Academy

Oregon is already feeling the impact of a much-reported shortage of professional pilots and aviation technicians world-wide.

“Earlier this year, Horizon Air, part of Seattle-based Alaska Air Group, had to slash hundreds of flights because it didn’t have enough pilots to keep up its schedule. In 2018, the pilot shortfall in the U.S. could reach 2,000 jobs—and in the next five years, it could reach 5,000 or more.”


DoD STARBASE Oregon Director Denise Kortes already promotes STEM education through STARBASE programs in Portland and Klamath Falls, but the scope of their program grew over the past summer. “We were approached by the Southern Oregon Education Service District (SOESD) about contributing to the educational pipeline targeted at creating interest in careers in aviation” said Kortes. “Henley High School (Klamath Falls) already offers a dual credit aviation course designed by Dr. Kristi Lebkowsky as part of this effort. Seeking to be part of the solution, STARBASE Oregon decided to offer a highly focused, camp style, Aviation Academy aimed at sparking interest at the Middle School level as part of their summer programming.”

THE MISSION:

Offer an engaging and comprehensive aviation adventure/opportunity for 16 Title 1 middle school students, highlighting the many facets of aviation and the subsequent higher education (scholarship) and employment opportunities — in other words, ignite advanced curiosity and big dreams! Community involvement was central to the success of the Aviation Academy and the generosity of Oregon STEM career professionals and educators was staggering! Volunteers who supported the academy included:

• Col. (Ret) Mike Bieniewicz, (USAF, Helicopter and F-15 Pilot) who drove six hours to Klamath Falls to teach the students a lesson he developed just for the academy. “The Spinning Wing,” showed the
students how the propeller is really “just a wing turned sideways.” The students then used PTC CREO Computer Aided Design and 3-D Printing to create their own propeller design. The propeller lesson culminated with Aerial Robotics (drones) to experience the spinning wing in flight.

- 173rd Fighter Wing Vice Commander Col. Jeff Edwards, (USAF, F-15 Instructor Pilot) who shared his personal flight history with the students.
- Braden Laurie, (Henley High School Aeronautical Engineering Student) spoke to the students about the Aeronautical Engineering Program at Henley High School and encouraged them to continue pursuing their interest in STEM.

- Dr. Kristi Lebkowsky, (HHS Instructor of Aeronautical Engineering and Project Lead-the-Way) offered her amazing glider curriculum to the STARBASE Oregon instructors to present to the Aviation Academy students. The students built and flew their own balsa wood and paper gliders.

In addition, tours of Kingsley Field were provided by:
- Oregon Air National Guard 270th Air Traffic Control Tower Squadron
- 173rd Fighter Wing Flight Operations Group Facility
- 173rd Fighter Wing AMXS Kingsley Field Flight Line

MISSION ACCOMPLISHED:
As a result of STARBASE Oregon’s inaugural Aviation Academy, a group of at-risk, local, middle school-aged youth were offered a glimpse at specific STEM career opportunities awaiting them, in a field vital to our regional and national economy. The collaborative contributions by the educational, STEM professional, and military communities of Oregon provided an eye-opening experience to these 16 young minds from rural southern Oregon. The Academy was such a resounding success that STARBASE Oregon has already made plans to offer an expanded, five-day Aviation Academy at each of their three STARBASE Oregon locations in the summer of 2019.
“I think DoD STARBASE gives the kids a glimpse and sparks an interest in science. It shows them that science can be fun and interesting. I think it promotes staying in school, becoming more disciplined in your studies and helps them in setting a goal. I believe that this program gives kids a desire to pick a better path for life knowing that by staying in school and studying, they can achieve anything they set their mind to.”

– W4 JOHN WURTZ, STARBASE RAPID CITY
A Letter from Spence Agee,
Superintendent Autauga County Schools

October 29, 2018

As a proud partner of STARBASE Maxwell for over a decade, Autauga County Schools has seen the incredible benefits of having students think critically as they use science, technology, engineering and mathematics to explore real-world situations through direct learning experiences. Every year, fifth grade students across our district are able to participate in the processes of inquiry, reasoning and collaboration through the STARBASE Maxwell curriculum while being fully engaged in well-designed, hands-on learning activities. Our partnership with STARBASE Maxwell plays a pivotal role in our school district’s mission to provide excellent educational experiences for all students to be successful.

As Superintendent, I have been extremely fortunate to work alongside amazing educators who recognize the importance of providing engaging, authentic STEM instruction. We understand that our students need to apply their knowledge in real world scenarios. They need to be motivated to learn. They need the ability to use critical-thinking and problem-solving skills. They need to be innovators. Our district’s comprehensive K-12 STEM initiative includes key strategies in reaching these goals, and STARBASE Maxwell supports our efforts through their carefully designed STEM instruction. The STARBASE Maxwell experience models effective instructional practices through complex and creative problem-based learning experiences. Teachers across our district are then able to replicate this STEM-rich environment in their own classrooms. The ripple effect on student learning is endless.

In my position, I have many opportunities to observe the multitude of STEM-based educational experiences offered to our students. One of the most rewarding experiences for me personally was attending the STARBASE Maxwell program with my daughter this year. She and her classmates worked collaboratively to develop a mission to space and design a space rover to aid in their exploration. The levels of engagement were remarkable. The instructors captured the students’ interest, taught the intended content, and inspired creativity. As the father of my own child and as Superintendent to all students involved, I was extremely proud.

Autauga County Schools and STARBASE Maxwell have a strong partnership that will continue for years to come. Our common goal is to equip students with the critical thinking, problem solving, creative and collaborative skills that are foundational to future success. STARBASE Maxwell is an invaluable asset to our community, and we are grateful for their commitment to our students.

Sincerely,

Spence Agee
Superintendent
SpaceX Teams with DoD STARBASE Los Alamitos on Team America Rocketry Challenge

Inspired by the high number of aerospace companies in our midst, DoD STARBASE Los Alamitos decided to pilot a Team America Rocketry Challenge (TARC) team in May 2015. “The competition seemed like a perfect fit for our students,” said STARBASE Los Alamitos Director Stacey Hendrickson. “It provided an opportunity to teach teamwork and persistence, along with what it took to build a successful rocket.”

In 2017, the first year they entered TARC, the students worked hard and built great rockets. Unfortunately, one blew up on the launch pad due to a faulty engine and they only managed to enter one qualifying launch. Still, the team learned so much and their passion for rocketry had been ignited. For the 2018 competition year, many students returned to the team and arrived more determined than ever to succeed. They began preparing in August 2017, meeting at least once a week to design rockets, dial in their altitude, adjust margins and basically doing anything and everything it took to build a successful rocket. The team gelled and knew they had a real chance at success, but some details were still off. The margins were not quite where they needed to be and the rockets were staying in the air too long. Before they reached their final launch, the team wanted to get some expert help and turned to SpaceX. Located about 18 miles away in Hawthorne, California, SpaceX is known for cutting edge rocketry and also for their community service endeavors. “Because they were fresh off the launch of the Falcon Heavy, we were not sure if any of the engineers would have the time to talk to us, but we wanted to try.” said Director Hendrickson. One of the teachers reached out to an engineer she knew that currently works at SpaceX and he agreed to take a look at the rockets. The team sent him the file containing all the work done so far and, not only did he look at it, but he decided to come in and work with students directly. When the meeting day came, he brought another engineer with him and the students were thrilled. Many were already familiar with SpaceX and their influence in the rocket world, and now they were getting expert advice from not one but TWO actual SpaceX rocket scientists. It
was like having rock stars on campus! The engineers wasted no time getting right to work, and the advice they provided was concrete and easy to understand. They advised to adjust payload and gave tips about overall rocket construction.

This advice was monumental for the STARBASE Los Alamitos TARC teams. In the past, they built rockets that performed brilliantly in RockSim, only to have them fall apart in midair without ever knowing or understanding why. The experienced SpaceX advisors shed light on the reasons for a faulty rocket that a computer can’t tell you. For instance, even if fins are perfect, if they are put on incorrectly or the glue used is not sticky enough, it can cause the entire rocket to fail. This inspired the team to invest in a new fin jig to ensure proper placement. The students switched to a laser cutter for precision in fin cutting. They invested in parachutes with a larger spill hole, and spent extra time on rocket construction. The students took the SpaceX advice to heart, and on launch day it showed! Now, the altitudes were dialed in, only a few feet off from the goal. Although the wind was heavy on launch day and the rockets didn’t land as quickly as they had hoped, the students still came very close to making the final fly off in Washington D.C. - only missing the cut off by two points.

All the STARBASE Los Alamitos TARC teams submitted two qualifying launches this year. No eggs were cracked, and the students came away completely inspired. Their excitement at the competition was so evident that a TARC official tweeted video from their launch. Most of all, none of them will ever forget the time the SpaceX engineers spent with their teams and look forward to 2019 with confidence and determination.

“"The competition seemed like a perfect fit for our students. It provided an opportunity to teach teamwork and persistence, along with what it took to build a successful rocket.”

- STACEY HENDRICKSON
Making DoD STARBASE a Priority for the Students of South Los Angeles

Luis Heckmüller’s commitment to and deep belief in the students and families of South Los Angeles brought him back to Watts, CA in 2008 when he became the principal at 96th Street Elementary School. His commitment to equity for all students and belief in empowering teachers and students led him to implement an instructional program that focused on student achievement. Part of that was to enroll all his 5th grade students in the DoD STARBASE program at Los Alamitos.

In 2016, Luis Heckmüller was promoted to Director of Instruction of the Jordan-Locke Network of schools in Local District South Los Angeles Unified School District, (LAUSD). There, he supervises and supports 16 schools that are impacted by poverty and the complex systems and conditions that are associated with it. His passion continues to drive his desire to reverse these conditions and provide all students with the necessary tools that are needed to succeed. And again, Luis partnered with STARBASE Los Alamitos as a resource. His goal was to use these partnerships to end the cycle of poverty, homelessness, violence and crime, by providing PK-6 children and families with the support, tools and educational experiences that they need to become college and career ready. What would be better than to expose them to STEM education and careers and to have them learn it from the many positive civilian and military role models associated with STARBASE Los Alamitos?

Mr. Heckmüller has found creative ways to secure bussing for the majority of the schools in Jordan Downs to participate. Thanks to his efforts, now 16 Watts area elementary schools participate in STARBASE on an annual basis.

Over the last five years, Mr. Heckmüller has noticed a marked change in the LAUSD fifth grade students who participate. Lashon Sanford, one of his participating principals, also noted the change. “Our students thoroughly enjoyed the hands-on lessons, concepts related to real life, challenging projects and help in igniting in STEM. After students experienced STARBASE, teachers noticed an evident enthusiasm, curiosity and interest in learning in the area of science. What was experienced by students at STARBASE simply cannot be duplicated in the classroom,” said Sanford. “It helps students’ acquire knowledge through hands-on, minds-on interactions, which creates extended learning opportunities, as well as glimpses into Next Generation careers. Thank you for the opportunity to participate in a meaningful field trip that has helped my students gain confidence and operate in forward thinking about STEM.”

And thank you, Luis Heckmüller for having the vision to make DoD STARBASE a priority for the students of South Los Angeles.
Robust partnerships are thriving in San Angelo, Texas and the DoD STARBASE initiative between Goodfellow Air Force Base (GAFB) and San Angelo ISD (SAISD) is at the pinnacle. This rigorous and well-developed learning experience will support our board and leadership team’s efforts to provide students a forum for critical thinking, creativity, effective communication and collaboration with peers. All 17 of our SAISD elementary campuses were provided access to this unique learning opportunity. We take great pride in providing an educational experience that supports our students in the next phase of their education and career path. DoD STARBASE Goodfellow provides real-time exposure as it relates to career fields in science, technology, engineering, and math (STEM). Exposure to the GAFB Fire School, training flight simulations, pharmacist, nutritionist, geologist, and a visit from our Congressman highlighted our journey. These experiences stimulate students’ problem solving skills and create communication opportunities that are based on real world scenarios. Students are increasing their passion for learning and are building positive relationships with military and civilian personnel.

Also, most students do not have access to our base due to security reasons and this opportunity provides students an additional military career pathway as an option for their future.

Our armed service men and women represent our Nation’s greatest patriots and collective intelligence. Utilizing their unique expertise supports academic outcomes for students in our school district.

School leaders helped write this grant, the San Angelo Museum of Fine Arts facilitated the grant and provides an educator, and SAISD provides the transportation for over 1,000 SAISD fifth graders to attend STEM classes in classrooms on GAFB. Many of our students have had no family member serve in the military, so this experience is opening the eyes of our children while they are manipulating science experiments through STARBASE curriculum.

CARL DETHLOFF
Superintendent
San Angelo ISD
“I enjoy the opportunity to get students to think outside the box. Especially having the privilege of working with two young female students and seeing the wheels turning while they are troubleshooting and using their imagination. As a female in a male dominated field it has been extremely rewarding to help young female students to see that the sciences are no longer a male dominated field and they can aspire to their full potential.”

- SSGT KATLYN BROOKSHIRE
USAF, STARBASE LOUISIANA
EXECUTIVE SUMMARY

The Department of Defense (DoD) sponsored STARBASE program provides Science, Technology, Engineering, and Math (STEM) learning and occupational awareness experiences to American youth at more than 60 military affiliated installations across the United States. Each year, conduct and effectiveness of the DoD STARBASE program is evaluated in several ways, including: structured interviews, questionnaires, program visits, and conversations with program participants. The program also is evaluated annually in terms of measuring basic STEM knowledge gained from program participation and improvements in student attitudes toward STEM subjects in the contexts of school, the military, and career opportunities. Assessments, interviews, and/or questionnaires were received from 1,548 students, 2,630 teachers, and all DoD STARBASE directors. A brief overview of the assessment highlights some of the key findings of the analysis.

HIGHLIGHTS

DoD STARBASE PROGRAM

• DoD STARBASE programs are located at a variety of military installations including: Air Force (10 locations), Air Force Reserve (4 locations), Army (1 location), National Guard (50 locations), and Marine Corps (1 location). The DoD STARBASE program conducted 2,952 classes serving 1,381 schools, in 396 school districts, across the United States and Puerto Rico during FY 2018.

• DoD STARBASE programs served primarily students from public schools (80 percent) in urban areas (77 percent), with 75 percent of the schools participating with DoD STARBASE meeting Title 1 requirements. Most of the DoD STARBASE locations (88 percent) serve school districts within a 50-mile radius of their program site.

• Over 76,000 students attended the 5-day program, and over 16,000 students participated in supplemental programs in FY 2018.

• The majority of DoD STARBASE students (93 percent) are 5th graders.

• Groups of students underrepresented in STEM fields and STEM careers served at DoD STARBASE include: Females (49 percent), American Indian or Alaskan Native (3 percent), Black/African American (23 percent), Hispanic or Latino (22 percent), Native Hawaiian or other Pacific Islander (1 percent), Low Income Students (63 percent), Students with Disabilities (8 percent), Students that use English as a second language (13 percent). The average instructor to student ratio for FY 2018 was 1:14.

• The average class size for FY 2018 was 25 students.

• The median operating cost per location was $367,500.
**DoD STARBASE Staffing**

- Contractor affiliations make up 53 percent of the employment relationships, followed by state affiliations at 47 percent.
- There was an 18 percent increase in the number of employees from FY 2017. Deputy directors and instructors tend to have 2-7 years of DoD STARBASE experience at 60 percent and 58 percent respectively. Instructional assistants have the least amount of DoD STARBASE experience with most (55 percent) just starting their first year. There were 65 staff departures in FY 2018. The majority (32 departures) were at the instructor level. Instructional assistants were the next highest with 14 departures followed by directors at 6 departures. The overall turnover rate in FY 2018 was 20 percent.

**DoD STARBASE Program Volunteers and Outreach**

- DoD STARBASE locations documented participation of 8,578 volunteers who contributed a total of 102,013 hours, worth an estimated $2,547,395.46.
- DoD STARBASE directors reported 9,962 hours of support by 2,114 military personnel with an additional 2,015 hours of support provided by 187 DoD Science and Engineering personnel.
- Many DoD STARBASE locations (26 locations) reported they have relationships with nearby teacher colleges or training programs where student teachers may obtain practicum hours at DoD STARBASE. At the DoD STARBASE locations that offer teacher training, 27 percent of the teachers may use this training towards their certification requirements.
- DoD STARBASE locations (54 of 66) report that they have relationships with other outreach programs in their area to include: STEM Forward, FIRST LEGO League, FIRST Robotics, Project Lead the Way, Civil Air Patrol, Girl Scouts, and Boy Scouts.
- Many DoD STARBASE locations (46 of 66 locations) also offer a variety of supplemental programs to area youth in grades K-12 when schools are not in session conducting 409 supplemental classes with 16,422 students.
- In FY 2018, 40 DoD STARBASE locations in 22 states reported coordinating a total of 78 DoD STARBASE 2.0 programs and 97 – 2.0 clubs.
- The average student retention rate within the 2.0 program was 88 percent. Relocations, time conflicts, and lack of interest in the chosen curriculum are cited by directors as the main reasons why students drop from the program.
- Former DoD STARBASE students made up 65 percent of the DoD STARBASE 2.0 program participants.
- Mentors (471 mentors) from a variety of professions participated in the DoD STARBASE 2.0 program to include: military (26 percent), DoD Science and Engineering Mentors (9 percent), nonmilitary/DoD Professionals (4 percent), industry professionals (12 percent), college students (5 percent), staff members for the school hosting the 2.0 program (21 percent), STARBASE staff members (19 percent), other types (4 percent).
- The DoD STARBASE 2.0 programs operate through a combination of federal and private funds. Of the 40 DoD STARBASE locations coordinating a 2.0 program, 48 percent receive funding from both sources and 52 percent operate using only their federal DoD STARBASE funds.
Student Assessment

- Most respondents were in 5th grade (98 percent) and therefore were between 10 and 11 years old.
- Approximately equal proportions of girls (49 percent) and boys (51 percent) were represented in the study sample.
- Eighty-four percent of the attitudinal items showed an increase in favorability from pre- to post-program. Moreover, 81 percent of those changes were statistically significant. Some of the largest shifts occurred in attitudes about STEM subjects, the military, and an interest in STEM-related careers.
- Performance on the knowledge items increased significantly, with a 30 percent improvement in the number of correct answers from pre- to post-program. That compares favorably to the 28 percent gain in 2017, 25 percent gain in 2016, the 26 percent positive change in 2015 and the 19 percent improvement seen in 2014.
  - Physics once again showed the largest improvement among curriculum areas (average increase of 46 percent in the number of correct answers).
  - Chemistry also showed a strong gain, with 38 percent more correct answers, slightly higher than last year’s 37 percent improvement result.
  - Mathematics scores improved substantially as well, with a 26 percent gain in the average number of correct answers.

Teacher Assessment

- 2,630 teachers from 62 academies responded to the survey. This number is nearly identical to last year’s total (N=2,639), which suggests the STARBASE program was stable in 2017-2018. There was neither growth nor a notable decline in the number of teachers responding to the survey as compared to last year, even while accounting for the additional academy location.
- The highest degree of endorsement occurred in teacher’s ratings for students showing more interest in learning about technology. Similarly, high, albeit slightly lower, ratings were found on three items addressing learning more about the topics of science, engineering, and math, in that order.
- Teachers also gave high ratings for increased student confidence in what they can accomplish and increased levels of student excitement about learning overall, cooperating, encouraging each other, and working in groups.
- Teachers strongly endorsed the statement that students talk about STARBASE long after the program has ended (mean=6.56 of a possible 7.00).
- Teachers strongly endorsed the statement that attending DoD STARBASE helps students better understand how STEM skills/abilities fit job requirements for certain career fields (mean=6.42 of a possible 7.00).
- Teachers strongly endorsed the statement that attending DoD STARBASE helps students better understand that developing their current STEM skills and abilities is necessary to have good future career choices (mean=6.41 of a possible 7.00).
- Of the teachers, 99.1 percent (2,607) indicated they will recommend DoD STARBASE to other teachers, principals, or school administrators.
- DoD STARBASE has influenced 87.3 percent of participating teachers to become skilled in STEM instruction.
- Participation in the DoD STARBASE program was cited by 89.2 percent (2,346) of the teachers in making them more aware of career opportunities (both uniformed and non-uniformed civilian) within the Department of Defense.

1 A total of 37 items are included on the attitudinal survey. Thirty-one items are administered both pre- and post-program, five items are administered post-program only, and one new pilot item is included in selected analyses only.
• The number of teachers who are “Very Likely” or “Extremely Likely” to recommend the DoD or the military as a career option to students jumped by nearly 31 percentage points (an 81 percent increase) after teachers participated in the DoD STARBASE program (Pre-program 38.3 percent Very or Extremely Likely to recommend versus 69.1 percent Very or Extremely Likely to recommend after attending a STARBASE Academy).

• Teachers reporting higher levels of support (e.g., resources provided by DoD STARBASE) responded more favorably to the attitudinal items as compared to those indicating having less support (See section: Impact of School and Teacher Support on Attitudinal Ratings in this report).

• As in past years, most teachers (82.8 percent) did not major or minor in a STEM-related discipline; however, only 1.4 percent of teachers (37 out of 2,630) reported lack of confidence in teaching STEM-related topics.

• Teacher endorsement of their Principal as a strong advocate for the STARBASE program increased from last year to break the 6.0 favorability mark. Results on this item are consistently strong, with the highest result for this item coming in 2015-2016 (6.3). The result in 2017-2018 is a solid 6.08, suggesting most teachers feel the program is supported by their school’s Principal.

Each section of the following report provides an assessment of the program’s progress and describes the unanticipated and/or unresolved issues that emerge in program operations. The report is organized as follows:

• DoD STARBASE Program Overview
• Program Oversight
• Fiscal Analysis
• Assessment Results
• Considerations
• Appendices

“The STARBASE program is extraordinary. It is a marvelous tool for teaching children STEM in an effective way. It infuses an authentic desire for learning sciences related topics. The lessons were not only useful immediately in their scholar work, but they also taught them how to apply what they learned into their everyday life. I love that they have to practice team work every visit.”

- JULIO AGUILO, PARENT OF A STUDENT AT WALKS/WEBS MAYAGÜEZ SCHOOL, ATTENDING STARBASE PUERTO RICO
DoD STARBASE PROGRAM OVERVIEW

The Participants

DoD STARBASE programs operate under the auspices of the Department of Defense (DoD) through the Office of the Assistant Secretary of Defense (OASD) for Manpower and Reserve Affairs (M&RA). A Congressional Appropriation to the DoD funds the operation of DoD STARBASE. Synergy between the local military base, schools, and surrounding communities enhance and strengthen the program.

During FY 2018, the DoD STARBASE program conducted 3,177 classes serving 1,287 schools, in 413 school districts, across the United States and Puerto Rico. More than 76,000 students attended the 5-day program in FY 2018. The program has grown from FY 2017 with a 6 percent increase in the number of students served, and an 8 percent increase in DoD STARBASE classes.

During the summer months many DoD STARBASE locations also offered a variety of supplemental programs to area youth in grades K-12. Of the 66 locations, 46 locations offered some type of supplemental program conducting 409 supplemental classes. A location’s ability to offer supplemental programing may be due to the number of part-time or seasonal staff, funding, and facility agreements with the hosting military installation. The number of students participating in supplemental programs during FY 2018 increased 42 percent to a total of 16,422 students from FY 2017.

Although, the number of students increased from FY 2017, the number of supplemental classes offered decreased from FY 2017 by 8 percent indicating that supplemental class sizes were considerably larger in FY 2018. The majority, (60 percent) of these students participated in supplemental programs conducted at the Oklahoma and Ohio locations. These locations offer a wide range of supplemental programs while most locations tend to offer one to three programs. The duration of supplemental programs varies from 1 day to 12 days. Supplemental programs provided in FY 2018 included: All Girls 3-day Academy, 5-day and 3-day Advanced Academy, Deaf and Hard of Hearing 5-day Academy, 12-day CAD Extension Program, 5-day Summer academy for Military Dependents, 1 – 3 day STEM camps, 2-day Tech Fest, Legacy 2-week Summer Academy, as well as aerospace education, robotics programming, and engineering challenges.

The Military

The military hosts and supports DoD STARBASE programs. Programs are located at various military installations including: Air Force (10 locations), Air Force Reserve (4 locations), Army (1 location), National Guard (50 locations), and Marine Corps (1 location).

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2 The majority (60 percent) of the students participating in supplemental programs are in the 5th, 6th, and 10th grades.
4 Most of the STARBASE academies operate within the confines of a military base. A few operate in an affiliate site contiguous to the military installation but under the property management of the base. Bayou State STARBASE in Rosedale, Louisiana is currently located at the original Iberville High School because there is not a military installation within 50 miles of a population of Title I students. STARBASE Oklahoma - Burns Flat is an outreach program. STARBASE NOVA Courage and STARBASE NOVA Honor are outreach units that serve Native Americans in South Dakota. STARBASE Connecticut - Waterbury is currently located at Naugatuck Community College because space became limited at the Waterbury Armory.
Most of the DoD STARBASE locations (88 percent) serve school districts within a 50-mile radius of the programs’ duty station.\(^5\) Locations that extend beyond a 50-mile radius generally have made special accommodations to reach more students such as those in the Native American outreach programs in South Dakota or the sparsely populated area surrounding Kingsley Field in Oregon. The demand for DoD STARBASE is so great that students travel from all over the island of Puerto Rico to participate in the program located in Carolina. DoD has a wealth of expertise in STEM education and provides the DoD STARBASE locations access to resources and services that most school systems cannot offer. Many elementary teachers do not have the time, educational background, and/or resources to cover STEM topics appropriately and simply cannot match the DoD STARBASE experience in their own classrooms. OASD/M&RA provides state-of-the-art equipment and technology, but military bases provide classroom space, utilities, and security. The base may also provide additional equipment, janitorial services, maintenance, travel services, and IT support. DoD STARBASE operates at the discretion of the base commander who may view this program as a venue for military personnel to positively interface with their community. As such, military personnel are encouraged to volunteer their time to the program as mentors, expert speakers, tour guides, and other support activities.

Military volunteers provide students with additional linkages between education and application. They may serve as guest lecturers to explain the use of STEM in different careers and/or act as base tour guides highlighting the use of STEM concepts in their missions and giving students access to military facilities and operations. Military volunteers share unique, informative, and highly varied experiences with the students, which provide an exciting, stimulating environment to enhance their STEM experience. Military volunteers provide a very powerful force to inspire students to set goals for their own lives and serve their communities as they grow. Modeling selfless service, consistent and conscientious leadership, dedication to mission, and respect and dedication to the United States, these hard-working, highly disciplined men and women distinguish themselves in such a way that others admire and want to emulate them. Participating classroom teachers are also inspired and encouraged by the involvement of military volunteers in the DoD STARBASE program.

### The School District

Students from local school districts surrounding the host military installation participate in the DoD STARBASE program. Schools participating in the DoD STARBASE program in FY 2018 include schools from Title 1 eligible, public, private, urban, and rural districts (see Table 1).

<table>
<thead>
<tr>
<th>School Type</th>
<th>Number of Schools</th>
<th>Percentage of Total Schools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title 1 Eligible</td>
<td>806</td>
<td>63</td>
</tr>
<tr>
<td>Public</td>
<td>909</td>
<td>71</td>
</tr>
<tr>
<td>Private</td>
<td>136</td>
<td>11</td>
</tr>
<tr>
<td>Urban</td>
<td>830</td>
<td>64</td>
</tr>
<tr>
<td>Rural</td>
<td>246</td>
<td>19</td>
</tr>
<tr>
<td>Total Schools</td>
<td>1,287</td>
<td>100</td>
</tr>
</tbody>
</table>

\(^1\) STARBASE Wright-Patt, STARBASE Vermont - Rutland, STARBASE New Mexico, STARBASE Vermont - South Burlington, STARBASE Kingsley, STARBASE Great Falls, and STARBASE Charlotte serve students beyond 50 miles of their host facility.

\(^6\) Numbers shown are for five-day programs and do not include other supplemental programs. Some schools may be counted in more than one category and will not total 100%. 31 schools were not classified as Public or Private.
As shown in Table 1, DoD STARBASE programs served primarily students from public schools (71 percent) in urban areas (64 percent) with 63 percent of the schools participating with DoD STARBASE meeting Title I requirements. The Title I program provides financial assistance through state educational agencies (SEAs) to local educational agencies (LEAs) and public schools with high numbers or percentages of economically disadvantaged children to help ensure that all children meet challenging state academic content and student academic achievement standards.7

School districts enter a formal agreement with the military base hosting the program in order to participate in DoD STARBASE. Accompanied by their classroom teacher, entire elementary classes are transported to their DoD STARBASE location to attend the 25-hour program over five consecutive days or on a weekly basis over five consecutive weeks. As such, DoD STARBASE exposes a richly diverse population of students to content and careers in STEM fields presenting unparalleled opportunities for underrepresented/underserved populations in STEM enrichment. As a result of the school’s participation in DoD STARBASE, the school’s curriculum is enhanced; students are better prepared for standardized state testing, and they are excited about continued STEM education and STEM careers.

The Community

Public and private organizations support and enhance the DoD STARBASE curriculum and operation. Community leaders may volunteer their time by serving on boards, assisting with gaining access to community facilities, visiting and/or presenting in the classrooms and/or raising financial support and awareness about the DoD STARBASE program. They also view the program as benefiting the community by promoting better life choices, problem-solving skills, and future job opportunities. Community leaders identify DoD STARBASE as a mechanism to nurture student interest in STEM and facilitate a well-trained STEM workforce and a STEM-literate public, thereby enhancing the future of their communities.

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The Program Elements of DoD STARBASE

The Department of Defense Instruction (DoDI) 1025.7 outlines the guidelines and directives for the DoD STARBASE program. The DoDI covers operational requirements such as budget, desired student grade level, class size, scheduling hours, curriculum guidelines, the desired demographics, documentation requirements, testing, and program location. If a DoD STARBASE director wishes to deviate from the DoDI requirements, he/she must submit a written request to OASD/M&RA. DoD STARBASE directors are required to report on these items annually in a national survey. Directors obtain aggregate data on students from the schools participating in the DoD STARBASE program to provide required student demographics. The analysis that follows is based on the data provided by the 65 fully operating DoD STARBASE locations. One location, STARBASE Edwards, was not operational in FY 2018 and did not report on students, operations, or curriculum although, limited data on financials was reported.

DoD STARBASE Students

GRADE LEVEL

The DoD STARBASE program is authorized to serve students in Kindergarten through 12th grade. Because of the dramatic decline in math and science performance by U.S. students after the 4th grade, the DoD STARBASE curriculum and standards are developed for the 5th grade level. Some locations (21) reported serving students in other grade levels in addition to the 5th grade, but most DoD STARBASE students are 5th graders (93 percent). Table 2 shows the number of students at each grade level. The total number of students served in FY 2018 was 76,711.

Table 2: Grade Level of FY 2018 DoD STARBASE Students

<table>
<thead>
<tr>
<th>Grade Level</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kindergarten through 3rd Grade</td>
<td>30</td>
</tr>
<tr>
<td>4th Grade</td>
<td>1,791</td>
</tr>
<tr>
<td>5th Grade</td>
<td>71,389</td>
</tr>
<tr>
<td>6th Grade</td>
<td>2,236</td>
</tr>
<tr>
<td>7th Grade</td>
<td>163</td>
</tr>
<tr>
<td>8th Grade</td>
<td>999</td>
</tr>
<tr>
<td>9th Grade and Above</td>
<td>113</td>
</tr>
<tr>
<td>Total Number of Students</td>
<td>76,711</td>
</tr>
</tbody>
</table>

9 Federal reporting requires aggregate data about all elementary and secondary students be reported to the DoD using one of the seven aggregate reporting categories discussed in the guidance given by the Department of Education (http://www2.ed.gov/policy/rschstat/guid/raceethnicity/questions.html#felsec).

8 The locations serving grades other than the 5th grade are: STARBASE Indiana - Fort Wayne, STARBASE Salina, STARBASE Goodfellow, STARBASE Wichita, STARBASE Peterson, STARBASE Connecticut - Windsor Locks, STARBASE Florida, STARBASE Minnesota - St. Paul, STARBASE Oklahoma - Tulsa, STARBASE Fort Harrison, STARBASE Hill Screaming Eagles, STARBASE Wisconsin, STARBASE One, STARBASE Vermont - South Burlington, STARBASE Vermont - Rutland, Winchester STARBASE Academy, Pelican State STARBASE, STARBASE Alpena, STARBASE Savannah, STARBASE Puerto Rico, and STARBASE Kingsley.
UNDERREPRESENTED/UNDERSERVED IN STEM

DoD STARBASE presents a unique opportunity to expose groups of students that have been historically underrepresented in STEM fields to STEM content and STEM careers. These groups include: Females, American Indians or Alaskan Natives, Blacks/African Americans, Native Hawaiians or other Pacific Islanders, Low Income Students, Students with Disabilities, and Students that use English as a second language. As stated previously, in FY 2018, DoD STARBASE programs primarily served students from public schools in urban areas. The concentration of students in these areas differs by race and ethnicity. The most recent data from The National Center for Education Statistics (NCES) documents a higher percentage of minority students (65 percent) attended schools in the central city with White students attending schools in mostly rural areas (79 percent). Table 3 shows the percentage of students from each of these groups.

Table 3: Groups Underrepresented/Underserved in STEM

<table>
<thead>
<tr>
<th>Group</th>
<th>Percentage of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females</td>
<td>49</td>
</tr>
<tr>
<td>American Indians or Alaskan Natives</td>
<td>3</td>
</tr>
<tr>
<td>Blacks/African Americans</td>
<td>23</td>
</tr>
<tr>
<td>Hispanics or Latinos</td>
<td>22</td>
</tr>
<tr>
<td>Native Hawaiians or other Pacific Islanders</td>
<td>1</td>
</tr>
<tr>
<td>Low Income Students</td>
<td>63</td>
</tr>
<tr>
<td>Students with Disabilities</td>
<td>8</td>
</tr>
<tr>
<td>Students that use English as second language</td>
<td>13</td>
</tr>
</tbody>
</table>

CLASS SIZE

Smaller class size is particularly important to the inquiry-based instruction used at DoD STARBASE locations. The DoDI requires two DoD STARBASE teachers per class or an average DoD STARBASE instructor to student ratio of 1:15, with 20-35 students as acceptable class sizes. The average instructor to student ratio for the FY 2018 program year was 1:14, with the average class size for the FY 2018 program at 25 students. Two locations reported averages below 20 students. The highest reported average class size was 32 students at STARBASE Kansas City.

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10 Hispanics and Latinos, African Americans, American Indians or Alaskan Natives, Native Hawaiians or other Pacific Islanders
12 STARBASE Minnesota - Duluth and STARBASE Minnesota - St. Paul reported averages of less than twenty students.
Many DoD STARBASE locations have increased their efforts to serve more students by opening additional DoD STARBASE classrooms so that classes may operate simultaneously. Additional DoD STARBASE classrooms allow schools to send more students, using the same transportation, who are then assigned a DoD STARBASE class. Depending on the number of students arriving from the school, the resulting “DoD STARBASE class” may contain students originating from multiple classrooms. In FY 2018, most (40 DoD STARBASE locations) operated simultaneous classes ranging from two to as many as six. On average, DoD STARBASE locations operate two simultaneous classes. The ability to operate simultaneous classes is dependent upon available space and personnel. DoD STARBASE locations are expected to serve a minimum of 28 classes per classroom and instructor pair each year. Table 4 shows the average number of classes conducted by sites operating one to six simultaneous classrooms.

Table 4: Number of Locations and Classes Served by Number of Classrooms

<table>
<thead>
<tr>
<th>Number of Classrooms</th>
<th>Number of STARBASE Locations</th>
<th>Average Number of Classes Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>50</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>104</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>197</td>
</tr>
</tbody>
</table>

“Planting the seeds of STEM in young mind is a critical step early in the educational process. Working with the DoD STARBASE program as a mentor and volunteer is the most rewarding experience. This experience not only inspires young minds in the fields of science and engineering, but also enriches my growth in being able to share what I have learned and how STEM is directly involved in my career. I truly believe this program will be a springboard to launch a child’s mind into careers and educational paths they would have never chosen otherwise.”

- MAJ RYAN BLAZEVIC, STARBASE MINNESOTA-DULUTH
DoD STARBASE Staff

EMPLOYMENT AFFILIATION
The DoDI provides general guidelines on personnel models, salary parameters, and position descriptions. The primary employment affiliations are state and contractor agencies. Employment affiliation is an important consideration for each location. The employee’s affiliation determines his/her salary administration, hiring requirements, benefits, personnel policy and practices, as well as reporting relationships. State affiliations often provide retirement and health benefits, which increases a location’s personnel costs and uses a greater portion of the location’s operating budget. Contractor affiliations make up 53 percent of the FY 2018 employment relationships, followed by state affiliations which are at 47 percent.

STAFFING MODEL
The DoDI outlines the prototypical staffing model for a DoD STARBASE location operating a single classroom. It includes broad guidelines on pay scale for each staff position. This model is also the basis for an annual budget for each location. The staffing model includes four full-time paid staff positions: a director, a deputy director/instructor, an instructor, and an office manager/administrative assistant. Determination of starting salaries is the prerogative of each location. The suggested pay scale equivalencies of the above positions in the DoDI are GS 12-13, GS 11-12, GS 9-11, and GS 6-9, respectively. If a location does not meet the DoDI prescribed manning model, the director must submit a written request for a waiver to OASD/M&RA. Of the DoD STARBASE locations, 25 operate a single classroom. Of these 25 locations, 7 also coordinate a DoD STARBASE 2.0 program. Table 5 outlines the staffing profile for full-time and part-time personnel of the DoD STARBASE locations with a single classroom.

<table>
<thead>
<tr>
<th>Position</th>
<th>Number of Staff</th>
<th>Full-Time</th>
<th>Part-Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director</td>
<td>22</td>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>Deputy Director/Instructor</td>
<td>25</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Instructor</td>
<td>33</td>
<td>32</td>
<td>1</td>
</tr>
<tr>
<td>Office Manager</td>
<td>20</td>
<td>19</td>
<td>1</td>
</tr>
<tr>
<td>Instructional Support</td>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>106</td>
<td>101</td>
<td>5</td>
</tr>
</tbody>
</table>

Many locations have adjusted the prototype staffing model to support additional classrooms and serve more students and/or support a DoD STARBASE 2.0 program. The most common changes in the staffing model are additions to instructional and support staff to meet the “two instructors per STARBASE classroom” requirement. Some locations restructure the administrative position to include instruction. Other DoD STARBASE locations have used the following adjustments: hire part-time instructors, establish job-sharing positions, consolidate job tasks, limit benefits, eliminate the deputy director position in favor of two instructors, eliminate the administrative position, and/or hire retirees who require fewer benefits. In FY 2018 other instructional support positions included: An Executive Director (IN), DoD STARBASE 2.0 coordinators, teaching assistants, tech assistants, principal oversight, accountants, and project managers. Table 6 shows the staffing profile for full-time and part-time personnel for DoD STARBASE locations operating 2 - 6 classrooms simultaneously.\(^\text{14}\)

<table>
<thead>
<tr>
<th>Position</th>
<th>Number of Staff</th>
<th>Full-Time</th>
<th>Part-Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director</td>
<td>40</td>
<td>40</td>
<td>0</td>
</tr>
<tr>
<td>Deputy Director/Instructor</td>
<td>29</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>Instructor</td>
<td>113</td>
<td>94</td>
<td>19</td>
</tr>
<tr>
<td>Office Manager</td>
<td>31</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>Instructional Support</td>
<td>52</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>265</strong></td>
<td><strong>213</strong></td>
<td><strong>52</strong></td>
</tr>
</tbody>
</table>

Tables 5 and 6 also show there are fewer staff directors than DoD STARBASE locations. Some directors manage more than one location, some DoD STARBASE locations are new and have not hired a director yet, and other DoD STARBASE locations are in the process of replacing directors who have left the program.\(^\text{15}\)

\(^{14}\) Full time is defined as an employee working more than 125 days per year.

\(^{15}\) Directors in Connecticut, North Carolina, Oklahoma, Oregon, South Dakota, and Vermont operate multiple STARBASE locations. The locations in Indiana are under the oversight of an Executive Director.
STAFF CHANGES AND DEPARTURES
Some (30 percent) DoD STARBASE staff have 2-4 years of DoD STARBASE experience. Directors (47 percent) have typically worked with DoD STARBASE for 5-10 years. Deputy directors and instructors tend to have 2-7 years of DoD STARBASE experience at 60 percent and 58 percent respectively. Office managers and instructional assistants have the least amount of DoD STARBASE experience with most (33 percent and 55 percent, respectively) just starting their first year. New staff members are typically trained on-the-job. Prior to teaching at DoD STARBASE, new instructors may observe experienced instructors, who often serve as their mentors. Instructors also attend regional workshops for delivery of computer aided design (CAD) software, tablet training and updates to the DoD STARBASE curriculum.

There was an 18 percent increase in the number of employees from FY 2017 and 65 staff departures in FY 2018. The majority (32 departures) were at the instructor level. Instructional assistants were the next highest with 14 departures followed by directors at 6 departures. The overall turnover rate in FY 2018 was 20 percent, which is the same as last fiscal year’s turnover rate. Directors reported the most common reasons that staff members who left the DoD STARBASE program gave was because of moving (12 percent), a better financial opportunity (12 percent) or terminated (12 percent).16 A few of these positions (12 vacancies) remained unfilled at the end of FY 2018.

Volunteers and Military Support
Volunteers are an essential participant group in the DoD STARBASE program. They serve as presenters, board members, advisors, tour guides, instructor aids, and perform a wide variety of daily support services. Volunteers include teachers, parents, and community leaders. All locations reported using volunteers.

The DoD STARBASE locations documented a total of 8,578 volunteers who contributed a total of 102,013 hours, worth an estimated $2,547,395.4617 contribution, to the program during FY 2018 (see Table 7). Parents account for the greatest number of volunteers, followed by teachers. Teachers participate in the DoD STARBASE program along with their students. Teachers and school personnel provide instructional support to the DoD STARBASE classroom and gain valuable classroom techniques that can be applied to activity-based education. It is estimated that teachers provided a volunteer value of $1,527,460.58 to the program in FY 2018. The amount of time donated by this field of experts (over 58,000 hours) is a testament to the school’s commitment and support of the DoD STARBASE program.

Table 7: FY 2018 Volunteer Participation

<table>
<thead>
<tr>
<th>Volunteers</th>
<th>Hours</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers/School Personnel</td>
<td>3,363</td>
<td>58,618</td>
</tr>
<tr>
<td>Parents</td>
<td>4,160</td>
<td>34,528</td>
</tr>
<tr>
<td>Community/Other18</td>
<td>1,055</td>
<td>8,867</td>
</tr>
</tbody>
</table>

16 Other reasons reported for leaving: Better Opportunity at Another Academic Institution (10 percent), Personal (10 percent), Non-Academic Career Change (9 percent), Retired (7 percent), Position Eliminated (3 percent), Accepted Position at STARBASE Participating School (1 percent), Resigned (1 percent), STARBASE funding uncertainty (1 percent).
17 The value of volunteer time presented here is the average wage of non-management, non-agricultural workers by state found at: https://www.independentsector.org/volunteer_time.
18 Other volunteers include STEM groups, firefighters, board members, etc.
Military personnel who support the DoD STARBASE program, inspire students’ interest and community engagement with linkages between education and application. They may serve as guest lecturers to explain the use of STEM in different careers and/or act as base tour guides highlighting the use of STEM concepts in their missions and giving students access to military facilities and operations. Military personnel share unique, informative, and highly varied experiences with the students, which provide an exciting, stimulating environment to enhance their STEM experience. DoD STARBASE directors reported 9,962 hours of support by 2,114 military personnel with an additional 2,015 hours of support by 187 DoD Science and Engineering personnel.

Outreach

Many DoD STARBASE locations provide resources and training to local teachers. Of the 66 locations, 26 locations provided training to local teachers in FY 2018. At the DoD STARBASE locations that offer teacher training, 27 percent of the teachers may use this training towards their certification requirements. The most common types of teacher training include continuing education workshops and experiential training for student teachers.

Students may attend DoD STARBASE at the 5th grade level, as well as participate in other outreach programs that are available in their area at other grade levels. OASD/M&RA encourages DoD STARBASE locations to connect with other local outreach programs to create an inventory of STEM programs to share with schools, teachers and students. Directors from 54 of the 66 DoD STARBASE locations report that they have relationships with other outreach programs in their area to include: FIRST LEGO League, FIRST Robotics, Civil Air Patrol, Girl Scouts, and Boy Scouts. In addition, the DoD STARBASE location may coordinate a DoD STARBASE 2.0 program at the middle school level.

“Upon experiencing DoD STARBASE for the first time, I was encouraged, inspired, and excited about the program. I left everyday thankful that our kids have the opportunity to experience it. Not only are the activities and experiments hands-on and full of good learning experiences, but they are full of group work and team building exercises that allow students to be challenged together and learn together. I love the bus ride back to school listening to the students excitedly talk about all the cool things they got to do and sharing their new found dreams of one day being a scientist, architect, or engineer.”

- KAYTON CHANEY, EDUCATOR AT CENTRAL ELEMENTARY SCHOOL, ATTENDING STARBASE FORT HARRISON
DoD STARBASE 2.0 Program

2.0 Program Elements

DoD STARBASE 2.0 is a STEM-based afterschool mentoring program that is based at a collaborating school system. The objective is to serve students at other grade levels in STEM areas beyond their initial DoD STARBASE experience. The program was introduced in 2010 and has expanded to 22 states. In FY 2018, 2.0 programs were organized by 40 DoD STARBASE locations who reported coordination of 78 DoD STARBASE 2.0 programs with 6 additional locations planning pilots for FY 2019. Throughout FY 2018, directors of the 40 locations were interviewed during site visitations and surveyed to obtain data on program requirements, participants, curriculum, staff, and funding to help determine the overall operational status of the DoD STARBASE 2.0 program.

Program Requirements

DoD STARBASE 2.0 is a unique school-based afterschool program that targets at-risk 6th to 8th graders. The program takes place in partnering schools that have expressed the desire for additional DoD STARBASE program resources. As with other school-based afterschool mentoring programs, DoD STARBASE 2.0 is highly structured and intends to help support school goals, provide safe environments for students, and improve student-teacher relationships, empowering schools through student referrals. Basic program requirements are outlined in the DoD STARBASE 2.0 Program Guide. The guide lists expectations for program basics, the partnering school, participant eligibility, and the STEM Mentor Coordinator position. The basic guidelines are:

- DoD STARBASE 2.0 meetings are held at a school
- There is ample space for meetings
- Meetings are held after school hours
- Parking is provided for mentors
- A nutritional snack is provided for the students
- The students are in 6th, 7th and/or 8th grades

Participants

In FY 2018, school districts and schools partnered with DoD STARBASE at 78 locations to operate 97 – STARBASE 2.0 clubs. The number of DoD STARBASE sites electing to coordinate a 2.0 program has increased by nine sites resulting in a nine percent increase in the number of 2.0 clubs. Many of the FY 2018 DoD STARBASE 2.0 students were former DoD STARBASE students (65 percent) and most were males (60 percent). The average club size was 15 students. In FY 2018, the DoD STARBASE 2.0 program served 1,658 student participants with a retention rate of 88 percent. Student participation has increased nine percent from FY 2017 and, the retention rate is up one percent from FY 2017. Directors reported several reasons why students discontinued the program. Relocation, time conflicts, and lack of interest in the chosen curriculum were cited as the main reasons why students drop from the program.

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19 In FY 2018, DoD STARBASE 2.0 programs were offered in Alabama, California, Colorado, Connecticut, Georgia, Indiana, Kansas, Louisiana, Michigan, Minnesota, North Carolina, New Mexico, Nevada, Ohio, Oklahoma, Oregon, South Carolina, South Dakota, Texas, Utah, Virginia, and West Virginia. Pilots are planned for FY 2019 at: STARBASE Kelly, STARBASE MCAS Beaufort, STARBASE North Dakota, STARBASE Vermont - South Burlington, STARBASE Vermont - Rutland, and STARBASE Connecticut - Waterbury

20 A 2.0 program is defined by the location where 2.0 meetings take place. A 2.0 program location may operate a number of 2.0 clubs.
2.0 Curriculum

Over the course of three-to-five months, DoD STARBASE 2.0 students work with a STEM mentor on a team project at their school during club meetings. The outcomes for students participating in DoD STARBASE 2.0 are as follows:

- Increased STEM interest and knowledge
- Reduced high-risk behavior
- Increased engagement with school
- Increased career awareness

Program locations use a variety of different team projects to achieve these goals. STEM projects include: Scalextrics, robotics, rocketry, engineering, physics, FIRST LEGO League, solar cars, chemistry, technology, and aerospace. Several programs culminate with some sort of related competition, such as FIRST LEGO League competitions and Team America Rocketry Challenge.21

Staff

STEM MENTOR COORDINATOR

DoD STARBASE 2.0 is primarily a volunteer program. The participation of volunteer STEM mentors and volunteer classroom teachers is coordinated by a designated DoD STARBASE STEM Mentor Coordinator. This is typically a part-time position and many programs choose to hire the STEM Mentor Coordinator in-house with their existing DoD STARBASE director, deputy director, program instructor, or office manager taking on the additional responsibilities. If hiring in-house is not possible, candidates are recruited from the partnering school or community. The duties of the STEM Mentor Coordinator play an invaluable role in the success of DoD STARBASE 2.0. The responsibilities of the STEM Mentor Coordinator include:

- Program marketing
- Managing relationships with schools
- Recruiting and screening program volunteers
- Managing volunteer STEM mentors
- Coordinating and delivering volunteer training
- Tracking data
- Supporting and motivating program volunteers
- Selecting program curriculum

21 FIRST LEGO League is a global competition where elementary and middle-school students build LEGO-based robots to complete tasks on a thematic playing surface. The Team America Rocketry Challenge (TARC) is an annual American model rocketry competition for students in grades 7 to 12 where students design, build and launch a rocket with specific characteristics.
STEM MENTORS

Mentors provide a vital role in the success of the participants and the program by providing a role model of a successful STEM professional. Serial engagements with professionals in STEM careers allow students to network with someone experienced in the field and to envision pathways for themselves to pursue those careers. Additionally, mentoring can be a powerful experience for STEM professionals, building work skills, and connecting them to their community. The ideal STEM mentor team consists of a lead STEM mentor, representatives from local STEM industries, college students, and members of the military. To serve as a DoD STARBASE 2.0 STEM mentor, volunteers must meet the following minimum requirements:

- Be at least 18 years of age
- Successfully pass mentor screening/background check
- Volunteer approximately six hours per month through the club duration

The 471 mentors who participated in the 2.0 program came from a variety of STEM professions and included military, non-military, DoD professionals, industry professionals, and college students (see Table 8). Working with a mentor, participating students are exposed to the lifelong benefits of higher education and a career in a STEM-related field. They may also receive guidance about educational and career options. The number of mentors participating in a DoD STARBASE 2.0 program increased from FY 2017 by eight percent.

Table 8: Mentor Types

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Mentors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Military</td>
<td>121</td>
</tr>
<tr>
<td>DoD Science and Engineering</td>
<td>43</td>
</tr>
<tr>
<td>Non-Military, DoD, Professionals</td>
<td>20</td>
</tr>
<tr>
<td>Industry Professionals</td>
<td>54</td>
</tr>
<tr>
<td>College Students</td>
<td>25</td>
</tr>
<tr>
<td>STARBASE Staff Members</td>
<td>90</td>
</tr>
<tr>
<td>Host School Staff Members</td>
<td>101</td>
</tr>
<tr>
<td>Other22</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total Number of Mentors</strong></td>
<td><strong>471</strong></td>
</tr>
</tbody>
</table>

Funding

The DoD STARBASE 2.0 programs operate through a combination of federal and private funds. Of the 40 DoD STARBASE locations coordinating a 2.0 program, 52 percent operate solely using their federal DoD STARBASE funds. The remaining 48 percent receive funding from combinations of federal and private funds. Private funds include: not-for-profit, donations, grants, and host school contributions.

22 Other types of mentors include: high school students, parents and police officers.
The DoD STARBASE Curriculum

Today's DoD STARBASE STEM curriculum is standardized, cutting-edge, research-based instruction that meets national educational standards and ensures a qualitative assessment of curriculum outcomes. Curriculum development is aligned with both the DoD STEM Education and Outreach Strategic goal to Inspire and two Priority Investment Areas within the Federal STEM Education 5-Year Strategic Plan: Increase and Sustain Youth and Public Engagement and Better Serve Groups Historically Underrepresented in STEM Fields. It also supports the Federal STEM Education goal to improve STEM instruction. As such, the DoD STARBASE curriculum is designed to increase the students’ involvement and interest in STEM activities, enhance their understanding of the role that STEM literacy plays in their lives, strengthen potential for future careers, and make the pursuit of STEM activities more attractive and accessible. It also contains the presentation of accurate scientific information, which promotes the development of STEM skills, knowledge, and practices, thereby supporting the Federal goals of a learning investment.

The 36 learning objectives are clearly outlined for each of the curriculum’s STEM categories, which are consistent with national education standards. The DoD STARBASE curriculum provides students the opportunity to engage in authentic scientific inquiries, which allow the participants to learn through experiential “hands-on, minds-on” based activities. For example, while studying the engineering design process, students design and create items with 3-D computer-assisted technology. The student summative assessment tool is applied pre- and post-program to determine if the learning objectives have been met.

There are four basic types of lesson plans that are used to teach DoD STARBASE learning objectives:

1. **Parent** lesson plans provide the introductory background, instructional strategies and materials required to teach the overall concepts of the curriculum objective. These are shorter in length and are always used in conjunction with lesson plan appendices.

2. **Appendix** lesson plans offer a choice of activities that provide students “hands-on, minds-on” opportunities to understand the introductory material presented in the parent lesson plan. When instructors establish their teaching criteria, they will use the parent lesson plan and then choose one of the approved appendices to complete the lesson. This allows DoD STARBASE instructors to differentiate their approach to teaching the learning objective.

3. **Activity Station** lesson plans are intended to give students multiple activities to strengthen their understanding of the learning objective. These inquiry-based stations are generally short, and in most cases, a number of stations are taught in conjunction with a curriculum segment. For example, a number of activity station lesson plans are in the final stages of development to support teaching Bernoulli’s Principles where one investigation of these principles might not be enough to ensure a higher level of understanding and application.

4. **Stand-Alone** lesson plans are complete, self-contained documents that fully address the stated components of the curriculum objective. They contain the necessary background information and instructional guidance and support criteria to meet the requirements for the objective.
This progressive curriculum is designed for DoD STARBASE students by a highly educated DoD STARBASE staff. Ideas for new lesson plans are solicited from the DoD STARBASE Directors and are then vetted by a Curriculum Committee that is comprised of experienced DoD STARBASE staff members. Lesson plans are adopted using a peer-review process which utilizes the expertise of the DoD STARBASE staff who field-test the proposed activities to further improve the pedagogy and delivery methodology.

This rigorous process expands and enhances the DoD STARBASE curriculum offerings. DoD STARBASE directors and instructors may choose from multiple approved lesson plans to teach the required 36 objectives. Directors are asked to create a schedule outlining the lessons they have chosen to teach. Although the focus is on using the approved lessons to teach the required objectives, the schedule also includes any time spent on academy management, student breaks, lunch, and graduation to give an accurate portrayal of how students spend their days at each DoD STARBASE location. Curriculum schedules are submitted annually with the Directors’ Questionnaire and are verified and validated during visitations by the evaluation team.

“Our military is often not something our young kids are very familiar with unless they have a family member serving. By hosting STARBASE in our Readiness Centers we create an opportunity for these young students to interact with our service members on the facility and as guest speakers and presenters in the class and lab setting as well. We also promote STEM interest and skills that our modern military depends on. Some of these students who get interested in careers in STEM due to their DoD STARBASE experiences may well be some of our service members in the future, bringing the technical skills to bear that we need. To me this is a “win-win” for everyone!”

- BG WALTER MERCER
WINCHESTER STARBASE ACADEMY
Program Oversight

Compliance

The Office of the Assistant Secretary of Defense (OASD) for Manpower and Reserve Affairs (M&RA) has the overall responsibility for the management of the DoD STARBASE program. The Department of Defense Instruction (DoDI) 1025.7 provides the policies and procedures that guide the current DoD STARBASE program locations. The DoDI directs the locations on operational requirements such as the number of classes, classroom hours, student numbers, target student population, participant eligibility, program site location for instruction, core curriculum, fiscal and property audits and frequency of them, and reporting requirements.

Compliance Procedures

A compliance program was designed and developed to ensure that the DoD STARBASE locations adhere to the DoDI requirements as well as administrative directions and reporting requirements. The program is reviewed and adjusted each year based on OASD/M&RA guidelines and is comprised of three progressive levels of program and organizational performance. Each level has a prescribed set of activities that range from obtaining adherence to the DoDI requirements that guide basic operating procedures and full installation of program delivery (Level I); to obtaining desirable operating applications, key planning strategies, and managerial efficiencies (Level II); and lastly, to exhibit advanced strategic program linkages and downstream relationships for promoting student skills and abilities in STEM-related activities (Level III). The following sections outline details of the performance assessment system.

For each DoD STARBASE location, the assessment system requires the attainment of each of the objectives at each level and their maintenance and sustainability over time to retain their status level. Performance level is determined through site visitations, academy reporting requirements, and periodic surveys using detailed criteria that is established and reviewed annually by the evaluation team.23 Shortfalls in required activities are usually handled through a corrective action schedule agreed upon by the participants and OASD/M&RA to successfully obtain the required performance level under review. In most cases, these corrective action plans are short-term and successfully obtained. The attainment of the performance level under review is held in abeyance until the corrective requirements are completed and verified.

The assessment system also requires that the academy can only advance to higher levels of performance after it successfully attains a positive assessment at the prior level (i.e., an academy must meet all required activities at Level I before it can claim any activities at Level II and so on). While an academy program could move towards and complete an activity at another level, the program would not be reviewed for acceptance until the prior level had been successfully achieved.

The successful attainment of these levels of performance provides OASD/M&RA and the military service representatives a way to determine whether an academy may be selected and/or considered for special programs that will be made available to locations at the required level. The system also distinguishes and identifies those locations that operate at higher levels of performance to their sponsors and participant groups, the local community, the target group of students, the school systems, and military sponsors.

23 Detailed criteria have been established for performance Levels I and II. Level III criteria will be introduced in FY 2019.
Performance Level Descriptions

Level I: The Basic/Fully Operating Location

Level I criteria includes all DoDI requirements and operating guidelines stipulated by OASD/M&RA. This incorporates required program activities such as student numbers, classroom hours, installation of core curriculum content, military-base program delivery, emphasis on target student population, required documentation (i.e., MOU’s, student waivers, etc.), reporting requirements, and a number of administrative responsibilities such as written waivers, disability building accessibility, testing samples, teacher assessment, etc.

Level II: The Advanced Performing Location

The second level of performance requires attainment of Level I status and success with a set of defined operational, planning, and managerial upgrades, fiscal program operations, and the successful installation and maintenance of a DoD STARBASE 2.0 program. These are organizational and administrative requirements set up by OASD/M&RA to obtain program delivery efficiencies and operational effectiveness.

These requirements include, but are not exclusive to, participant group involvement; program enhancements; STEM program inventories and an assessment of potential fit that enhances student participation in further skill development; budget management planning and review; public relations planning; personnel management plans; equipment status assessment; “children-at-risk” review; staff development/personnel plans; transfer of leadership plans (i.e., succession plans); management resource manuals; and several other considerations that upgrade program management and operating performance.

Level III: A High Performing Location

Academies must achieve Level I and II status levels before they can be assessed at Level III. Level III requires the development of an activity, or set of activities, that significantly advances the DoD STARBASE program vision and mission. Operational and program enhancements, higher-level problem-solving techniques, time-sensitive improvements, and efficiencies in operations could be included in the assessment of Level III activities if they are of significant magnitude. High priority activities are those that promote the welfare and STEM skill/abilities of the student population, demonstrate program sustainability, provide transportability to other locations, and have the ability to be installed and operable within an 18-to-24-month period.

The validation of the program’s installation and sustainability, as well as the operational potential for transportability, would be reviewed by the evaluation team for approval by OASD/M&RA.

Each of the above performance levels are reviewed on an ongoing basis for location-wide application, appropriate-level designation, the typical period in which they can be successfully attained, and the ability for downstream sustainability. As collaborations and newly established operations are introduced, the academy performance level review process is expected to be refined and expanded.
Compliance Adherence

In FY 2018, 24 of the 46 conducted visitations focused primarily on Level I compliance. The Level I visitation is conducted on a three-year cycle, regardless of performance level, to confirm basic compliance with program requirements. This visitation involves a two-to-five day review of documents, audits, fiscal reports, classroom observation, and structured interviews with staff, school administration, sponsor groups, not-for-profit board members (if appropriate), and members from other participant groups. At the conclusion of the visit, a meeting is conducted with the commanding officer hosting the program and DoD STARBASE director to review the preliminary results of the compliance visit and to discuss if any corrective action is required. A plan-of-action is developed, and a schedule for completion is mutually agreed upon. A written report is then sent to the OASD/M&RA program manager upon completion of the visitation. OASD/M&RA may share the key points of the report with the director and/or the commanding officer. A written summary of progress, made by the DoD STARBASE director, is sent to OASD/M&RA as corrective tasks are obtained, and copies may be forwarded to sponsors and military service representatives. In some instances, a follow-up visitation is recommended by the evaluation team to document that corrective action has been taken and provide assistance in obtaining Level I performance.

Newly installed locations (or existing sites with a new DoD STARBASE Director) may receive an orientation visitation to outline DoDI requirements and document Level I compliance. Five orientation visits were conducted in FY 2018. The director and staff are briefed and provided information and materials on best practices, testing administration, reporting schedules, documentation, performance expectations, and protocols. This time is also used to answer any questions and concerns the staff and sponsors may have.

The non-compliant activities most commonly noted are primarily technical in nature. They include lack of timely responses to periodic and required reporting schedules; lack of local financial and property audits within the required three-year period and/or documented requests by the location to have them conducted by the appropriate local base agency; incomplete documentation and/or lack of a written request for modification to OASD/M&RA for exceptions or revisions on DoDI 1025.7 requirements; and incomplete implementation of the core curriculum. Given the number and scope of activities, the number of incidents is small and involves only a few locations. Overall, most locations met compliance requirements. A small number of locations face challenges in obtaining student numbers, hours of instruction, audit schedules and completions, and meeting reporting requirements in a timely fashion.

24 Orientation visits were conducted at: STARBASE Goodfellow, STARBASE Sacramento, STARBASE Minnesota - Duluth, Bayou State STARBASE, and STARBASE Indiana - Gary.
Fiscal Analysis

A congressional appropriation to the Department of Defense (DoD) funds the operation of DoD STARBASE. The Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs (M&RA) oversees the program and distributes funding. In FY 2018, the total program budget was $30,000,000. OASD/M&RA allocated $27,534,411 to program operations. The remainder of the appropriation was used for assessment activities, staff development and training programs, and overall program design and development activities.

In FY 2018, the median operating cost per location was $367,500. Several factors contribute to the cost variances, including geographic location, number of operational classrooms, type and number of outreach programs, salary scales and number of employees. OASD/M&RA annually reviews each location’s budget to maintain an equitable distribution of funds.

Operating simultaneous classrooms requires duplicate equipment, supplies and staff. Many DoD STARBASE locations offset these expenses by sharing equipment between classrooms and hiring seasonal and/or part time instructional staff. These offsets keep staff costs down to around 72 – 85 percent of the operating budget. Operating costs per operational classrooms are given in Table 9.

<table>
<thead>
<tr>
<th>Classrooms</th>
<th>Median</th>
<th>Range</th>
<th>Average Staff Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$310,000.00</td>
<td>$85,615.00 - $579,000.00</td>
<td>$251,029.64</td>
</tr>
<tr>
<td>2</td>
<td>$379,195.00</td>
<td>$169,500.00 - $727,701.00</td>
<td>$308,556.84</td>
</tr>
<tr>
<td>3</td>
<td>$460,000.00</td>
<td>$310,000.00 - $648,491.11</td>
<td>$366,239.70</td>
</tr>
<tr>
<td>4</td>
<td>$830,501.00</td>
<td>$787,000.00 - $901,000.00</td>
<td>$598,970.98</td>
</tr>
<tr>
<td>6</td>
<td>$1,031,865.00</td>
<td>$1,031,865.00</td>
<td>$701,796.01</td>
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</tbody>
</table>

“DoD STARBASE has aided in providing partnership opportunities with the elementary schools in the local area of Manhattan, KS. Operations Kids Camp enjoys the STEM learning during camp in Salina. While at Manhattan our teenage kids have volunteer opportunities during the summer aiding with the teens’ community involvement and volunteer credit for school.”

- MAJ CHARLES LUNKWITZ, STARBASE MANHATTAN

25 STARBASE Minnesota - St. Paul is the only location with six operational classrooms. Other DoD STARBASE locations operate up to four simultaneous classrooms.
Overall expenditures of DoD STARBASE funds allocated to each program site are shown in Figure 1. Staff costs, on average, account for 78 percent of the site budget followed by equipment (8 percent), supplies (6 percent), and contract services (4 percent). Also shown are costs for facilities, travel/transportation and public relations/outreach. Travel and transportation costs are for staff business travel.

In addition to DoD funds, 30 of the 66 locations obtained funding from non-DoD sources such as state allocations, grants, and donations. The total raised from non-DoD funding for FY 2018 was $705,969.25. A total of $704,850.25 (99.8 percent) was expended in FY 2018. Academies use supplemental funding for staff salaries (48 percent); supplies (26 percent); equipment (5 percent); public relations/outreach (4 percent); transportation/travel (4 percent); facilities/furnishings (2 percent); program/curriculum development (1 percent); contract services (4 percent); and other expenditures (6 percent).
Student Assessment

Overview

In an effort to engage American youth in Science, Technology, Engineering, and Math (STEM) activities, along with building awareness of exciting careers in STEM fields, the Department of Defense (DoD) sponsors the STARBASE program at more than 60 military affiliated installations across the United States. The effectiveness of the DoD STARBASE program is evaluated each year by assessing student gains in basic STEM factual knowledge, as well as changes in student recognition of the STEM-related nature of more than two dozen occupations. In addition, the program’s impact is gauged by surveying student attitudes toward and interest in STEM activities in the contexts of school, the military, and their future careers. The results of this annual evaluation serve to document the program’s value and impact and are useful for making further enhancements of the DoD STARBASE curriculum.

This evidence-based approach to program evaluation commences with a pre-test. Students are asked by their Instructors to complete the DoD STARBASE Student Assessment Questionnaire at the start of the DoD STARBASE program. Students subsequently complete a post-test assessment, at the completion of the instructional program. The key pre- to post-program assessment domains include:

- Attitudes about STEM topics
- Attitudes about STEM careers, both military and civilian
- Attitudes about the military (e.g., military personnel, military locations)
- Knowledge items that measure STEM conceptual understanding

The Student Assessment Questionnaire is considered for revision each year to adapt to changes in the DoD STARBASE program, as well as to reflect the evolving direction of student engagement with STEM learning opportunities and career interests. Each item is evaluated based on the current year’s assessment results by subject matter experts who manage the DoD STARBASE program curriculum, as well as professionals from the testing and measurement industry. Annual changes tend to be small to moderate because many scientific principles and facts are perennial and continuity in assessments allows more accurate comparison across years.

Instrument Design

The 2017-18 DoD STARBASE Student Assessment Questionnaire used a set of 17 knowledge items, 1 listing-based knowledge item, and 37 attitudinal items. Pilot items and historical items are maintained in an item data bank for possible use in future administrations and to allow for year-to-year comparisons.

Both the national standards for STEM learning objectives and the DoD STARBASE curriculum have been largely consistent during the past few years. Nonetheless, STEM exercises and activities for the students participating at local DoD STARBASE academies are often adapted and modified from one year to the next. The DoD STARBASE Student Assessment is updated annually to:

- Continually align the assessment with the DoD STARBASE learning objectives and DoD sponsor objectives
- Gather data on pilot items that can be utilized in future assessments
- Minimize the risk of teaching solely to the assessment
As in previous years, the survey instrument for 2017-2018 consists of two separate assessments combined into one questionnaire. The first assessment is an 18-item test of STEM understanding that is focused on the core DoD STARBASE curriculum.

- **Knowledge Test** – 17 multiple-choice items and 1 ‘choose all that apply’ nomination item were included in the assessment of STEM understanding. Sixteen items used in prior years were found to be reliable, and one was modified from a previously used item.

  The listing item measures changes in student perceptions by presenting a list of 25 occupations and asking the students to identify all jobs that utilize or require STEM knowledge. The change is based on how many of the 25 occupations students identify as STEM-related before vs. after attending DoD STARBASE. Results from this exercise consistently reflect favorably on the program. But, it would not be psychometrically appropriate to co-mingle the results of this STEM-job awareness item with results from more traditional knowledge items (e.g., identifying the correct chemical composition of the air we breathe). Therefore, a composite score based on the 17 multiple-choice items was used for most of the evaluations of knowledge gains.

The second assessment is a 37-item survey measuring various aspects of students’ attitudes and opinions about STEM subjects, the DoD STARBASE program, and the military, with a focus on topics that impact academic success and future career goals. One attitude item is new and is not included in most analyses.

- **Attitudinal Survey** – 32 survey items were administered both pre- and post-program. A new trial item was included about communication with family but it is not included in the overall attitude composite analyses. Five program evaluation items administered post-program only also were included in the survey.

Data collected from students with the Knowledge Test and the Attitudinal Survey appear in this report as item results; results based on groups of items are identified as category results. There are also overall composite scores, which are presented as a mean score (i.e., group average score) and as a percent score (i.e., percent correct for Knowledge Test; percent favorable for Attitude Survey). Item results, category results, and overall results are typically compared between different groups of students or between different time periods to test for statistically significant differences that may reveal important information about the student participants, the impact of DoD STARBASE participation in a given year, or trends that can be seen across years.

**Study Logistics**

The DoD STARBASE Student Assessment was administered between January and June of 2018. The Student Assessment was administered twice to the same participating class of students (pre- and post-program) at each participating academy to gauge program impact. The assessment forms were shipped directly to the DoD STARBASE academies and included the following instruction sets:

- **Directors’ Instructions** – Overview of the DoD STARBASE evaluation components including details such as administration methodology, selection of participating classes, and an answer key for the Knowledge Test.
- **Administration Instructions** – Detailed instructions to the assessment coordinators including the materials needed for administration, filling out the assigned student code numbers, and instructions to be read during the administration of the questionnaire.

Completed questionnaires were returned to General Dynamics Information Technology (General Dynamics IT) for processing using scan form technology.
Student Demographic Information

A total of 60 of the 66 DoD STARBASE Academies participated in 2017-18 student assessment\textsuperscript{26}. The student survey was administered during the first half of 2018, yielding a total of 3,347 surveys (1,686 pre-program and 1,661 post-program) returned to General Dynamics IT for processing. Responses were received from all 60 of the DoD STARBASE academies participating for a 100 percent response rate, which is even better than the 98 percent in 2017 and 2016.

Surveys were matched pre- and post-program based on unique student ID codes. Those with matching data for both the pre- and post-program were retained for analysis, resulting in a total of 1,624 pre-test/post-test matched pairs. Of these 1,624 matched pre-test/post-test cases, 76 had more than 3 missing items from either the pre-questionnaire or the post-questionnaire, and so were excluded from the analyses. That resulted in 1,558 pre-test cases, 1,614 post-test cases, and 1,548 paired pre-test/post-test cases that are referenced throughout this report.

DoD STARBASE academies are hosted by military installations across the nation, with over 47 percent of student assessments coming from the South (27 percent) and Southeast (20 percent) combined. Another 30 percent came from the Midwest and 16 percent were from the West. A smaller percentage of the students were assessed at DoD STARBASE academies in the East (7 percent). Table 10 contains the relevant details.

Five military service components sponsor DoD STARBASE programs. The National Guard is the most represented component, with 45 sites in the DoD STARBASE program and 70 percent of the students assessed. The Air Force has 9 sites (15 percent of students assessed), the Air Force Reserve has 4 sites (12 percent of assessed students), while the Army (1 percent) and the Marine Corps (2 percent) each have 1 participating site.

<table>
<thead>
<tr>
<th>Table 10: Regional Profile of DoD STARBASE Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
</tr>
<tr>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Region</td>
</tr>
<tr>
<td>East</td>
</tr>
<tr>
<td>Midwest</td>
</tr>
<tr>
<td>South</td>
</tr>
<tr>
<td>Southeast</td>
</tr>
<tr>
<td>West</td>
</tr>
<tr>
<td>Sponsoring Component</td>
</tr>
<tr>
<td>Air Force</td>
</tr>
<tr>
<td>Air Force Reserve</td>
</tr>
<tr>
<td>Army</td>
</tr>
<tr>
<td>Marine Corps</td>
</tr>
<tr>
<td>National Guard</td>
</tr>
</tbody>
</table>

Note: Percentages may not total to precisely 100 percent within categories due to rounding

\textsuperscript{26} The newly installed STARBASE Indiana - Gary, STARBASE Idaho, STARBASE Edwards, and STARBASE Minnesota - Duluth, were not fully operational at the time of the student survey. STARBASE Oklahoma - Fort Sill and STARBASE Oklahoma - Tinker AFB did not participate due to a public school teacher strike.
Students’ previous exposure to military people and awareness of the DoD STARBASE program are presented in Table 11. Two-thirds of the students knew someone who went through DoD STARBASE (68 percent), had heard about DoD STARBASE (64 percent), and/or had met military people before coming to the DoD STARBASE program (64 percent). Still, roughly a third of participants had no previous contact with the DoD STARBASE program or military personnel before their participation, indicating that the program is successful in reaching out to the general community of 5th grade students in the locale of each academy.

<table>
<thead>
<tr>
<th>Item Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have met military people before coming to DoD STARBASE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>581</td>
<td>35.8</td>
</tr>
<tr>
<td>Yes</td>
<td>1,043</td>
<td>64.2</td>
</tr>
<tr>
<td>I heard about DoD STARBASE before I knew I was coming here</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>528</td>
<td>32.5</td>
</tr>
<tr>
<td>Yes</td>
<td>1,095</td>
<td>64.2</td>
</tr>
<tr>
<td>I know someone that went through DoD STARBASE before me</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>5199</td>
<td>32.0</td>
</tr>
<tr>
<td>Yes</td>
<td>1,103</td>
<td>67.9</td>
</tr>
</tbody>
</table>

Note: Percentages may not total to precisely 100 percent within categories due to rounding.

The frequency and percent of DoD STARBASE students who reported belonging to the various demographic categories are presented in Table 12. As in previous years, the DoD STARBASE student population is fairly evenly split between boys and girls (51.0 percent and 48.9 percent, respectively). Nearly all students were in the 5th grade (98.0 percent).

<table>
<thead>
<tr>
<th>Item</th>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade</td>
<td>4</td>
<td>2</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>1,590</td>
<td>98.0</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>31</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Unknown/No answer</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Gender</td>
<td>Boy</td>
<td>829</td>
<td>51.0</td>
</tr>
<tr>
<td></td>
<td>Girl</td>
<td>794</td>
<td>48.9</td>
</tr>
</tbody>
</table>

Note: Percentages may not total to precisely 100 percent within categories due to rounding.
Students’ Attitudinal Responses

The following analyses provide a summary of the Attitudinal Survey results for both the pre-program survey and the post-program survey. The analyses include those surveys with no more than 3 missing items for either survey. The attitudinal items were rated by students using a 7-point Likert scale that has a range of response choices from 1 (Strongly Disagree) through 7 (Strongly Agree). The scale is anchored by a smiling face for Strongly Agree and by a frowning face for Strongly Disagree.

For the students responding to both the pre- and post-program attitude questionnaire, many of their pre-program responses started out positive and increased in favorability in the post-program assessment. This suggests that these students entered the program with generally positive attitudes about STEM, the military and technology-related careers, and that these attitudes were reinforced throughout the DoD STARBASE program.

Pre-program and Post-program Attitudinal Survey Means

To provide a five-year comparison, the DoD STARBASE pre- and post-program Attitudinal Survey total mean scores are shown in Table 13, beginning in 2014. Total mean scores are a composite averaged value of all the items on the survey, so it also has a possible range from 1 (Strongly Disagree, or least favorable) to 7 (Strongly Agree, or most favorable). The pre-program means include the 31 core survey items. The post-program means include the 31 core survey items plus the 5 post-program evaluation items. Utilizing mean scores in pre- to post-program comparisons controls for the difference in the total number of items given. The appendix provides explanations of the statistical techniques used to analyze group differences and relationships throughout this report.

As in the previous years, there was a significant increase (p < .001) in post-program mean scores as compared to pre-program mean scores, indicating that students responded even more favorably following their DoD STARBASE participation. The total mean scores for the pre- and post-program are fairly typical compared to recent years. Additional details are provided in Table 13, including the total mean attitudinal scores as well as the score shift from pre- to post-program, starting from 2014. It must be pointed out that, of the 37 attitude items, 17 were verbatim from prior years, 14 had slight wording modifications from prior years, and 1 was new. A larger number of changed and trial items were used in 2014 and carried into 2015. As a consequence, some dissimilarity in the overall means from 2015 as compared to the 2018 overall means was expected.


<table>
<thead>
<tr>
<th>Survey</th>
<th>2014 Mean*</th>
<th>2015 Mean*</th>
<th>2016 Mean*</th>
<th>2017 Mean*</th>
<th>2018 Mean*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Program</td>
<td>5.78</td>
<td>5.18</td>
<td>5.56</td>
<td>5.62</td>
<td>5.62</td>
</tr>
<tr>
<td>Post-Program</td>
<td>5.91</td>
<td>5.59</td>
<td>5.77</td>
<td>5.85</td>
<td>5.84</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Program</td>
<td>0.63</td>
<td>0.86</td>
<td>0.77</td>
<td>0.76</td>
<td>0.77</td>
</tr>
<tr>
<td>Post-Program</td>
<td>0.67</td>
<td>0.86</td>
<td>0.76</td>
<td>0.79</td>
<td>0.75</td>
</tr>
</tbody>
</table>

* Pre- and post-program means are significantly different, p < .001.
Table 14 rank-orders the attitude items, based on post-program means, from most favorable to least favorable. Seventy-seven percent of the items show some degree of increase in favorability from pre- to post-program means. The 27 starred items (representing 87 percent of the 31 core items assessed at both pre-test and post-test) show a statistically significant increase in favorability from pre-program to post-program attitudes. A number of items show what is called a “ceiling effect”; the responses were so positive at the pre-test that there was little room for an increase. For example, on an item such as “I think I will remember enjoying my time at DoD STARBASE”, the pre-program mean value of 6.29 represents 90 percent of the maximum possible. Although the higher post-test score of 6.34 was not a significant increase, it was 91 percent of the maximum, which clearly reflects positively on the value that students are getting from the DoD STARBASE program. Other items also started out at a very high level and remained so at the end.

Only one item showed a significant decrease. The mean of the item “I would like to know more about science” declined 1.5 percent from 5.86 to 5.77, which was less than the 2.22 percent drop in that item in 2017 (from 5.85 to 5.72). In both years, the decline was small, and the mean remained positive in that it is well above the scale mid-point (3.5). A few other items also had minimal decreases. In 2017, for example, the mean of the item “I want to learn more about technology” declined 2.01 percent, from 5.97 to 5.85. But in 2018, the change on that item was a statistically nonsignificant 0.1 percent, from 5.91 to 5.88, indicating interest in technology both started and ended at a high level. Considering the consistently positive changes on the other items, these small declines can be regarded as normal statistical fluctuations.
Table 14: Pre/Post Rankings and Mean Scores of Student Attitudinal Responses

<table>
<thead>
<tr>
<th>Pre-Program N=1,558</th>
<th>Attitudinal Item</th>
<th>Mean</th>
<th>Rank</th>
<th>Post-Program N= 1,614</th>
<th>Mean</th>
<th>Sig.</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I like doing science experiments.</td>
<td>6.31</td>
<td>1</td>
<td></td>
<td>6.48</td>
<td>***</td>
<td>1</td>
</tr>
<tr>
<td>post only</td>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>6.21</td>
<td>3</td>
<td></td>
<td>6.36</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>People who work for the military do lots of different things.</td>
<td>6.29</td>
<td>2</td>
<td></td>
<td>6.35</td>
<td>***</td>
<td>3</td>
</tr>
<tr>
<td>post only</td>
<td>I think I will remember enjoying my time at DoD STARBASE.</td>
<td></td>
<td></td>
<td></td>
<td>6.34</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>DoD STARBASE Instructors made learning about science, technology, engineering,</td>
<td></td>
<td></td>
<td></td>
<td>6.23</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>and math topics fun.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I like technology.</td>
<td>6.11</td>
<td>4</td>
<td></td>
<td>6.20</td>
<td>***</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Most people use science, technology, math or engineering skills every day.</td>
<td>5.93</td>
<td>7</td>
<td></td>
<td>6.20</td>
<td>***</td>
<td>7</td>
</tr>
<tr>
<td>post only</td>
<td>DoD STARBASE is boring. (Reverse Scored)</td>
<td></td>
<td></td>
<td></td>
<td>6.19</td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>I do not think DoD STARBASE will help me do better in school. (Reverse Scored)</td>
<td>6.05</td>
<td>5</td>
<td></td>
<td>6.17</td>
<td>***</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Math is important for developing new technology.</td>
<td>5.95</td>
<td>6</td>
<td></td>
<td>6.16</td>
<td>***</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>I am aware of some jobs that use math, science, engineering, or technology</td>
<td>5.87</td>
<td>12</td>
<td></td>
<td>6.14</td>
<td>***</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Engineers help solve challenging problems.</td>
<td>5.71</td>
<td>19</td>
<td></td>
<td>6.14</td>
<td>***</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Scientists work on things that make life better.</td>
<td>5.93</td>
<td>8</td>
<td></td>
<td>6.13</td>
<td>***</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Math is really useful for solving engineering problems.</td>
<td>5.78</td>
<td>17</td>
<td></td>
<td>6.10</td>
<td>***</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>People who work for the military use technology in their jobs.</td>
<td>5.76</td>
<td>18</td>
<td></td>
<td>6.10</td>
<td>***</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>Learning about science, engineering, technology, and math will help me in my</td>
<td>5.92</td>
<td>9</td>
<td></td>
<td>6.05</td>
<td>***</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>daily life.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Military bases are exciting.</td>
<td>5.88</td>
<td>11</td>
<td></td>
<td>6.02</td>
<td>*</td>
<td>17</td>
</tr>
<tr>
<td>post only</td>
<td>I will tell others about my DoD STARBASE experience.</td>
<td></td>
<td></td>
<td></td>
<td>5.99</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>post only</td>
<td>I think almost any kid would have fun learning at DoD STARBASE.</td>
<td></td>
<td></td>
<td></td>
<td>5.96</td>
<td></td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>A lot of good jobs use math to solve problems.</td>
<td>5.80</td>
<td>14</td>
<td></td>
<td>5.94</td>
<td>***</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>I like learning how technology works.</td>
<td>5.80</td>
<td>15</td>
<td></td>
<td>5.90</td>
<td>***</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>I want to learn more about technology.</td>
<td>5.91</td>
<td>10</td>
<td></td>
<td>5.88</td>
<td></td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>I would like to know more about science.</td>
<td>5.86</td>
<td>13</td>
<td></td>
<td>5.77</td>
<td>***</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>I enjoy learning about science, technology, math, and engineering topics.</td>
<td>5.59</td>
<td>20</td>
<td></td>
<td>5.73</td>
<td>***</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>I would be interested in a STARBASE club at my school if it were offered.</td>
<td>5.78</td>
<td>16</td>
<td></td>
<td>5.71</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>A military base is a good place to work.</td>
<td>5.31</td>
<td>25</td>
<td></td>
<td>5.57</td>
<td>***</td>
<td>26</td>
</tr>
<tr>
<td></td>
<td>Jobs that use math, engineering, technology and science are exciting.</td>
<td>5.43</td>
<td>21</td>
<td></td>
<td>5.56</td>
<td>***</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>I talk with my family about my plans for the future. (trial item)</td>
<td>5.41</td>
<td>22</td>
<td></td>
<td>5.42</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>I like engineering.</td>
<td>5.15</td>
<td>27</td>
<td></td>
<td>5.51</td>
<td>***</td>
<td>29</td>
</tr>
</tbody>
</table>
Table 15 provides the top 10 significant pre- to post-program attitudinal shifts for the 2018 program year. All of these changes were in the favorable direction. For example, there was a seven percent increase in the favorability of attitudes about becoming a scientist or engineer. There also was a seven percent increase in the students’ perceptions regarding their level of ease of learning science and a seven percent increase in the student believing he or she is good at science. Such results suggest that the DoD STARBASE program is having its intended impact on attitudes about STEM.

A six percent greater positivity towards a job that involves science, math, engineering and technology after attending DoD STARBASE is another indication that the program is achieving its goals. There also was a five percent increase in reports of being aware of jobs that use math, science, engineering or technology. Finally, there was a six percent increase in recognition that people who work for the military use technology in their jobs, and a five percent increase in agreement that a military base is a good place to work. Such results clearly illustrate the value of the STARBASE program as an effective community relations program of the DoD.

Table 14: Pre/Post Rankings and Mean Scores of Student Attitudinal Responses, cont.

<table>
<thead>
<tr>
<th>Pre</th>
<th>Post</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.38</td>
<td>23</td>
<td>I am good at math.</td>
</tr>
<tr>
<td>5.48</td>
<td>***</td>
<td>30</td>
</tr>
<tr>
<td>5.10</td>
<td>28</td>
<td>I am good at science.</td>
</tr>
<tr>
<td>5.45</td>
<td>***</td>
<td>31</td>
</tr>
<tr>
<td>5.31</td>
<td>26</td>
<td>I want to learn more about engineering.</td>
</tr>
<tr>
<td>5.40</td>
<td>*</td>
<td>32</td>
</tr>
<tr>
<td>5.35</td>
<td>24</td>
<td>Teachers at my school are excited about science.</td>
</tr>
<tr>
<td>5.31</td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>4.98</td>
<td>29</td>
<td>When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.</td>
</tr>
<tr>
<td>5.30</td>
<td>***</td>
<td>34</td>
</tr>
<tr>
<td>4.89</td>
<td>30</td>
<td>Learning about science is easy for me.</td>
</tr>
<tr>
<td>5.24</td>
<td>***</td>
<td>35</td>
</tr>
<tr>
<td>4.63</td>
<td>31</td>
<td>Teachers at my school talk about why technology is important.</td>
</tr>
<tr>
<td>4.81</td>
<td>***</td>
<td>36</td>
</tr>
<tr>
<td>4.35</td>
<td>32</td>
<td>I am interested in being a scientist or engineer.</td>
</tr>
<tr>
<td>4.65</td>
<td>***</td>
<td>37</td>
</tr>
</tbody>
</table>

* *p < .05, ** *p < .01, *** *p < .001. The ranks for means that appear equal were resolved at the third decimal point.

“DoD STARBASE is absolutely PHENOMENAL! I have been involved with students during the regular school day as well as the after school 2.0 program. The instructors are always striving to present the material and experiments in a way that promotes each student thinking and problem-solving skills. The instructors exhibit nothing but perfection, courtesy, and professionalism.”

- MSGT DONNIE PURETT, STARBASE WEST VIRGINIA MARTINSBURG

Attitude Changes Following DoD STARBASE

Table 15 provides the top 10 significant pre- to post-program attitudinal shifts for the 2018 program year. All of these changes were in the favorable direction. For example, there was a seven percent increase in the favorability of attitudes about becoming a scientist or engineer. There also was a seven percent increase in the students’ perceptions regarding their level of ease of learning science and a seven percent increase in the student believing he or she is good at science. Such results suggest that the DoD STARBASE program is having its intended impact on attitudes about STEM.

A six percent greater positivity towards a job that involves science, math, engineering and technology after attending DoD STARBASE is another indication that the program is achieving its goals. There also was a five percent increase in reports of being aware of jobs that use math, science, engineering or technology. Finally, there was a six percent increase in recognition that people who work for the military use technology in their jobs, and a five percent increase in agreement that a military base is a good place to work. Such results clearly illustrate the value of the STARBASE program as an effective community relations program of the DoD.
Math and Science Attitudinal Ratings

Similar to previous years, students’ mean attitudes on science and math in Table 16 are more positive post- as compared to pre-program. Specifically, students show significant shifts in their self-perceptions about being good at science and to a lesser extent in math, post-program. This suggests that the exposure to STEM concepts covered within the program curriculum is giving them more confidence in their science and math abilities. There was little change in students’ liking for doing science experiments, which was already quite high, but there was a substantial increase after attending DoD STARBASE in the appreciation of math as a tool for addressing engineering problems.

<table>
<thead>
<tr>
<th>Attitudinal Item</th>
<th>Pre-Program Mean</th>
<th>Post-Program Mean</th>
<th>Percent Positive Shift Pre- to Post- Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineers help solve challenging problems.</td>
<td>5.71</td>
<td>6.14</td>
<td>7.52</td>
</tr>
<tr>
<td>Learning about science is easy for me.</td>
<td>4.89</td>
<td>5.24</td>
<td>7.24</td>
</tr>
<tr>
<td>I am good at science.</td>
<td>5.1</td>
<td>5.45</td>
<td>6.94</td>
</tr>
<tr>
<td>I like engineering.</td>
<td>5.15</td>
<td>5.51</td>
<td>6.92</td>
</tr>
<tr>
<td>I am interested in being a scientist or engineer.</td>
<td>4.35</td>
<td>4.65</td>
<td>6.81</td>
</tr>
<tr>
<td>When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.</td>
<td>4.98</td>
<td>5.3</td>
<td>6.42</td>
</tr>
<tr>
<td>People who work for the military use technology in their jobs.</td>
<td>5.76</td>
<td>6.1</td>
<td>5.91</td>
</tr>
<tr>
<td>Math is really useful for solving engineering problems.</td>
<td>5.78</td>
<td>6.1</td>
<td>5.58</td>
</tr>
<tr>
<td>A military base is a good place to work.</td>
<td>5.31</td>
<td>5.57</td>
<td>4.89</td>
</tr>
<tr>
<td>I am aware of some jobs that use math, science, engineering, or technology.</td>
<td>5.87</td>
<td>6.14</td>
<td>4.67</td>
</tr>
</tbody>
</table>

Math and Science Attitudinal Item Mean Scores (2018)

<table>
<thead>
<tr>
<th>Math and Science Attitudinal Items</th>
<th>Pre-Program Mean</th>
<th>Post-Program Mean</th>
<th>Gap Score* (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am good at science.</td>
<td>5.10</td>
<td>5.45</td>
<td>+0.35*** (6.86)</td>
</tr>
<tr>
<td>I am good at math.</td>
<td>5.38</td>
<td>5.48</td>
<td>+0.10** (1.86)</td>
</tr>
<tr>
<td>I like doing science experiments.</td>
<td>6.31</td>
<td>6.48</td>
<td>+0.16*** (2.69)</td>
</tr>
<tr>
<td>Math is really useful for solving engineering problems.</td>
<td>5.78</td>
<td>6.10</td>
<td>+0.32*** (5.54)</td>
</tr>
</tbody>
</table>

** p < .01, *** p < .001
* Gap Score is the difference (or gain) in Post-Program mean from Pre-Program mean value.
Table 17 shows the historical means for the science and math items beginning in 2014. The attitudes across years remain consistently favorable. After a slight drop in 2017, there is a recovery of students’ believing that he or she is good at science. The mean for “I like doing science experiments” is quite high. Similarly, the mean for “Math is really useful for solving engineering problems” is also high, and higher than the previously used item of “I like math.” It is too soon to tell if these trends will continue.

<table>
<thead>
<tr>
<th>Post-Program Attitudes</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am good at science.</td>
<td>5.51</td>
<td>5.45</td>
<td>5.44</td>
<td>5.33</td>
<td>5.45</td>
</tr>
<tr>
<td>I am good at math.</td>
<td>5.33</td>
<td>5.48</td>
<td>5.54</td>
<td>5.44</td>
<td>5.48</td>
</tr>
<tr>
<td>I like science/I like doing science experiments. (2017-18)</td>
<td>5.88</td>
<td>5.57</td>
<td>5.74</td>
<td>6.46</td>
<td>6.48</td>
</tr>
<tr>
<td>I like math/Math is really useful for solving engineering problems. (2017-18)</td>
<td>5.23</td>
<td>5.16</td>
<td>5.26</td>
<td>6.11</td>
<td>6.10</td>
</tr>
</tbody>
</table>

**Attitudes as a Function of Geographic Region**

Educational policies in the United States, including curriculum content and school funding decisions, are made at the local and state level. At the same time, regional trends may be evident, with contiguous states behaving more similarly than differently in their educational trends. To explore the possibility that regional trends could have an influence on students’ readiness for and benefit from the DoD STARBASE curriculum, a series of analyses were conducted on the effect of Region on the Student Attitude Survey and pre-STARBASE experiences with the military.

Analyses indicated that the impact of Region fell just short of statistical significance on pre-program attitudes (F (4, 1572) = 2.26, p = .06), but was highly significant for post-program attitudes (F (4, 1616) = 8.70, p < .0001). As Table 18 reports, students from the South and Southeast began the program with the most favorable attitudes. By contrast, the Midwest region started out with more negative attitudes than their peers and showed less increase in favorability than did other students. Yet starting from behind need not be a major handicap; students from the West started out with somewhat negative attitudes but finished the DoD STARBASE program with the most favorable attitudes. Further research, including drilling down to the level of the States, may be warranted to further examine Regional effects.
Military-Related Attitudes

The DoD STARBASE curriculum is delivered mainly at military installations, but such facilities are not distributed across the United States in a way that allows all students to have equal exposure to the military and/or DoD STARBASE. A set of analyses was conducted to examine if prior exposure to military personnel and DoD STARBASE varied by Region. As shown in Table 19, significant relationships with geographic Region were found for all prior experience items, including the student having met military people before coming to DoD STARBASE ($F(4,1619) = 7.69, p < .001$), where students from the Southeast had an advantage over students from the West and East. There also were regional differences in students having heard about DoD STARBASE before coming ($F(4,1618) = 8.48, p < .001$), which favored students from the East and Midwest over students from the South. Finally, students from the East and Midwest were more likely to have known someone who went through the DoD STARBASE program before the respondent ($F(4,1617) = 10.01, p < .001$), compared to students from the South.

### Table 18: Pre-Program and Post-Program Attitudes by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Pre-Program Mean</th>
<th>Pre-Program Favorability Rank</th>
<th>Post-Program Mean</th>
<th>Post-Program Favorability Rank</th>
<th>Gap Score*</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>5.64</td>
<td>3</td>
<td>5.69</td>
<td>4</td>
<td>0.05</td>
</tr>
<tr>
<td>Midwest</td>
<td>5.54</td>
<td>5</td>
<td>5.65</td>
<td>5</td>
<td>0.11***</td>
</tr>
<tr>
<td>South</td>
<td>5.67</td>
<td>1</td>
<td>5.87</td>
<td>2</td>
<td>0.20***</td>
</tr>
<tr>
<td>Southeast</td>
<td>5.67</td>
<td>1</td>
<td>5.85</td>
<td>3</td>
<td>0.18***</td>
</tr>
<tr>
<td>West</td>
<td>5.59</td>
<td>4</td>
<td>5.89</td>
<td>1</td>
<td>0.30***</td>
</tr>
</tbody>
</table>

* Gap Score is the difference (or gain) in Post-Program mean from Pre-Program mean value.*

*** $p < .001$ value.

### Table 19: Relation of Geographic Region to Prior Experience with Military Personnel and DOD STARBASE

<table>
<thead>
<tr>
<th>Region</th>
<th>I have met military people before coming to DoD STARBASE.</th>
<th>I heard about DoD STARBASE before I knew I was coming here.</th>
<th>I know someone who went through DoD STARBASE before me.</th>
</tr>
</thead>
<tbody>
<tr>
<td>East</td>
<td>59.65%</td>
<td>76.11%</td>
<td>78.95%</td>
</tr>
<tr>
<td>Midwest</td>
<td>64.66%</td>
<td>74.35%</td>
<td>74.14%</td>
</tr>
<tr>
<td>South</td>
<td>63.18%</td>
<td>58.18%</td>
<td>57.31%</td>
</tr>
<tr>
<td>Southeast</td>
<td>74.29%</td>
<td>64.97%</td>
<td>66.95%</td>
</tr>
<tr>
<td>West</td>
<td>53.17%</td>
<td>70.63%</td>
<td>71.83%</td>
</tr>
</tbody>
</table>
COMPARISONS OF ATTITUDES BASED ON PRIOR EXPERIENCE WITH MILITARY PERSONNEL

Students who had prior experience with military locations and personnel tended to have more positive attitudes, both at the pre- and post-program assessments, compared to students who lacked such previous encounters. Prior experience was determined by affirmative response to the descriptive item “I have met military people before coming to DoD STARBASE”. As expected, those with prior military exposure had significantly more positive attitudes, both before (5.68 vs. 5.51, F (1,1576) = 18.09, p < .0001) and after program completion (5.83 vs. 5.71, F (1,1620) = 9.54, p < .002). This difference was evident on 11 items, presented in Table 20, including greater appreciation for science, engineering, military bases and STEM.

There were five items on which participants with prior exposure to the military had more favorable attitudes only on the pre-program assessment. These results suggest that participants with low exposure to the military caught up and had comparably favorable attitudes at the conclusion of the program.

As Table 20 shows, these items include: seeing military bases as exciting, seeing military bases as a good place to work, and seeing one’s teachers as excited about science. These outcomes testify to the salutary impact of the DoD STARBASE program on attitudes, even for those students without prior experience with the military.

Table 20: Significant Differences in Attitudinal Items Based on Prior Military Contact

<table>
<thead>
<tr>
<th>Attitudes That Are More Positive with Prior Military Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am good at science. (pre- &amp; post)</td>
</tr>
<tr>
<td>Learning about science is easy for me. (pre- &amp; post)</td>
</tr>
<tr>
<td>I am good at math. (pre- &amp; post)</td>
</tr>
<tr>
<td>Engineers help solve challenging problems. (pre- &amp; post)</td>
</tr>
<tr>
<td>I like engineering. (pre- &amp; post)</td>
</tr>
<tr>
<td>Math is really useful for solving engineering problems. (pre- &amp; post)</td>
</tr>
<tr>
<td>Math is important for developing new technology. (pre- &amp; post)</td>
</tr>
<tr>
<td>I am aware of some jobs that use math, science, engineering, or technology. (pre- &amp; post)</td>
</tr>
<tr>
<td>People who work for the military do lots of different things. (pre- &amp; post)</td>
</tr>
<tr>
<td>People who work for the military use technology in their jobs. (pre- &amp; post)</td>
</tr>
<tr>
<td>When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering. (pre- &amp; post)</td>
</tr>
<tr>
<td>Military bases are exciting. (pre- only)</td>
</tr>
<tr>
<td>Teachers at my school are excited about science. (pre- only)</td>
</tr>
<tr>
<td>A military base is a good place to work. (pre- only)</td>
</tr>
<tr>
<td>I want to learn more about engineering. (pre- only)</td>
</tr>
<tr>
<td>Most people use science, technology, math or engineering skills every day. (pre- only)</td>
</tr>
<tr>
<td>I enjoy learning about science, technology, math, and engineering topics. (post- only)</td>
</tr>
</tbody>
</table>

Note: Group mean values are omitted for simplicity. They are available upon request.
COMPARISONS BASED ON PRIOR KNOWLEDGE OF DOD STARBASE

Knowledge of the program was measured by responses to the item: “I heard about DoD STARBASE before I knew I was coming here.” Those familiar with DoD STARBASE responded more favorably to the pre-test Attitudinal Survey items (5.65 vs. 5.56, F (1, 1,574) = 4.92, p = 0.03), but that difference was reduced to insignificance by the time of the post-program assessment (5.85 vs. 5.81, F (1, 1,619) = 0.83, p = 0.36). This result suggests that those who heard about the program started the program with more positive attitudes, but nearly all participants had positive attitudes at the end.

Inspection of the individual Attitudinal Survey items reveals that those who had heard about DoD STARBASE had more favorable attitudes about their mathematics ability and about military bases both before and after the program, as shown by Table 21. The “prior knowledge of DoD STARBASE” group was also more inclined, in the post-program survey, to want to learn more about technology. Most interesting was the finding that seven attitude items were different only at the pre-program assessment, indicating that participation in the DoD STARBASE program dramatically reduced the differences between those with prior knowledge of DoD STARBASE and those lacking such knowledge. These favorable changes included attitudes dealing with military bases being a good place to work, the helpfulness of the DoD STARBASE program and its linkage to their schools and teachers, enjoyment of learning about STEM, and the work of engineers in solving challenging problems.

Table 21: Significant Differences on Attitudinal Survey Items Based on Prior Knowledge of DoD STARBASE

<table>
<thead>
<tr>
<th>Pre- and Post-Program</th>
<th>Pre-Program Only</th>
<th>Post-Program Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am good at math.</td>
<td>A military base is a good place to work.</td>
<td>I want to learn more about technology.</td>
</tr>
<tr>
<td>A military base is a good</td>
<td>People who work for the military do lots</td>
<td></td>
</tr>
<tr>
<td>place to work.</td>
<td>of different things.</td>
<td></td>
</tr>
<tr>
<td>I do not think DoD STARBASE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would be interested in a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STARBASE club at my school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>if it were offered.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers at my school talk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>about why technology is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>important.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy learning about</td>
<td></td>
<td></td>
</tr>
<tr>
<td>science, technology, math,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and engineering topics.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineers help solve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>challenging problems.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: All attitudes were more positive among students with prior knowledge of the DoD STARBASE program. Mean values of item responses by DoD STARBASE knowledge group are omitted for simplicity. They are available upon request.
SHIFTS IN MILITARY-RELATED ATTITUDES

Table 22 shows the four items in the Attitudinal Survey related to perceptions surrounding the military. Significant positive change ratings were observed for the post-test items “People who work for the military do lots of different things” (mean = 6.35), “People who work for the military use technology in their jobs” (mean = 6.10) and “Military bases are exciting” (mean = 6.02). Although the post-test item rating for “A military base is a good place to work” (mean = 5.57) ranked lower than the other items, it was still substantially above the 3.5 midpoint of the scale and increased significantly as a function of participation in the DoD STARBASE program. In general, there is a significant and consistent trend for students’ attitudes about the military to be positively influenced by their DoD STARBASE experiences.

Table 22: Pre- to Post Attitudinal Shifts on Military-Related Items (2014 - 2018)

<table>
<thead>
<tr>
<th>Military Attitudinal Items</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>People who work for the military do lots of different things.</td>
<td>+.19***</td>
<td>.08*</td>
<td>.07*</td>
<td>+.13**</td>
<td>+.14***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.21-6.35</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.26%</td>
</tr>
<tr>
<td>Military bases are exciting.</td>
<td>+.18***</td>
<td>+.18***</td>
<td>+.09*</td>
<td>+.12*</td>
<td>+.14***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.88-6.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.43%</td>
</tr>
<tr>
<td>A military base is a good place to work.</td>
<td>+.17***</td>
<td>+.34***</td>
<td>+.22***</td>
<td>+.22***</td>
<td>+.26***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.31-5.57</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.89%</td>
</tr>
<tr>
<td>People who work for the military use technology in their jobs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+.24***</td>
</tr>
<tr>
<td>(2017)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+.34***</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.76-6.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.91%</td>
</tr>
</tbody>
</table>

*p < .05, **p < .01, ***p < .001

“DoD STARBASE helps our school actually fit science into our instruction. What a great partnership!”

- EDUCATOR AT WALTER LONG ELEMENTARY SCHOOL, ATTENDING STARBASE NELLIS
COMPARISON OF HIGH VS. LOW MILITARY ATTITUDE

Overall military attitudes were calculated based on a composite of the four items identified in Table 22. Consistent with prior years, students with a total of 27 or 28 (out of a possible 28) on those items in the post-program assessment were categorized as having high military attitudes (n=517). Students with a total of 19 or less on those same items were categorized as having low military attitudes (n=260).

Table 23 provides the responses for all the attitudinal items, which have been rank-ordered from largest to smallest gap score between the high and low military attitude groups. As expected, the greatest differences occur with the first four items that make up the composite scale. Other pre- to post-program item differences between the high and low military attitudes groups reflect more meaningful attitudinal differences. Those with more favorable attitudes on the four military items demonstrate:

- More interest in STEM activities, broadly described (e.g., “When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.” “Jobs that use math, engineering, technology and science are exciting.” “I enjoy learning about science, technology, math, and engineering topics.”);
- More interest in science (“I would like to know more about science.” “Scientists work on things that will make life better.”);
- More interest in technology (“I like learning how technology works.” “I want to learn more about technology.”);
- More interest in engineering (“I want to learn more about engineering.” “I like engineering.”);
- More interest in mathematics (“Math is important for developing new technology.” “A lot of good jobs use math to solve problems.”);
- Greater appreciation for the DoD STARBASE program (“I think almost any kid would have fun learning at DoD STARBASE.” “I will tell others about my DoD STARBASE experience.” “DoD STARBASE Instructors made learning about science, technology, engineering, and math topics fun.” “I would be interested in a STARBASE club at my school if it were offered.”).

In summary, the results in Table 23 show students with more receptive attitudes toward the military also appear to be more receptive and able to absorb and retain the STEM-related lessons and applications presented in the DoD STARBASE context. All of the gap differences between students with high or low military attitude scores presented in Table 23 represent item differences for the post-program testing session; all results are statistically significant (p < .05).

“The students were excited when they heard the word catapult! Bernoulli and flight were great hands on activities with easily accessible items. Great idea with the inflatable globes.”

- HEATHER HEYMeyer, EDUCATOR ATTENDING STARBASE NOVA COURAGE
Table 23: Statistically Significant Post-Program Gap Scores Based on Low and High Military Attitudes

<table>
<thead>
<tr>
<th>Attitude Item</th>
<th>Low Military Attitude (n = 260)</th>
<th>High Military Attitude (n = 517)</th>
<th>+ Gap*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-Program Attitudes (mean total) Composite Score</td>
<td>4.98</td>
<td>6.37</td>
<td>1.39</td>
</tr>
<tr>
<td>A military base is a good place to work.</td>
<td>3.67</td>
<td>6.83</td>
<td>3.16</td>
</tr>
<tr>
<td>Military bases are exciting.</td>
<td>4.07</td>
<td>6.92</td>
<td>2.85</td>
</tr>
<tr>
<td>People who work for the military use technology in their jobs.</td>
<td>4.75</td>
<td>6.91</td>
<td>2.16</td>
</tr>
<tr>
<td>People who work for the military do lots of different things.</td>
<td>5.06</td>
<td>6.97</td>
<td>1.91</td>
</tr>
<tr>
<td>I want to learn more about engineering.</td>
<td>4.32</td>
<td>6.17</td>
<td>1.85</td>
</tr>
<tr>
<td>I would be interested in a STARBASE club at my school if it were offered.</td>
<td>4.58</td>
<td>6.36</td>
<td>1.78</td>
</tr>
<tr>
<td>I am interested in being a scientist or engineer.</td>
<td>3.65</td>
<td>5.39</td>
<td>1.74</td>
</tr>
<tr>
<td>Jobs that use math, engineering, technology and science are exciting.</td>
<td>4.53</td>
<td>6.25</td>
<td>1.72</td>
</tr>
<tr>
<td>I like engineering.</td>
<td>4.54</td>
<td>6.22</td>
<td>1.69</td>
</tr>
<tr>
<td>I enjoy learning about science, technology, math, and engineering topics.</td>
<td>4.70</td>
<td>6.34</td>
<td>1.64</td>
</tr>
<tr>
<td>When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.</td>
<td>4.38</td>
<td>5.96</td>
<td>1.58</td>
</tr>
<tr>
<td>I think almost any kid would have fun learning at DoD STARBASE.</td>
<td>5.00</td>
<td>6.49</td>
<td>1.49</td>
</tr>
<tr>
<td>A lot of good jobs use math to solve problems.</td>
<td>5.05</td>
<td>6.49</td>
<td>1.44</td>
</tr>
<tr>
<td>I would like to know more about science.</td>
<td>4.87</td>
<td>6.31</td>
<td>1.44</td>
</tr>
<tr>
<td>Learning about science, engineering, technology, and math will help me in my daily life.</td>
<td>5.19</td>
<td>6.56</td>
<td>1.37</td>
</tr>
<tr>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>5.12</td>
<td>6.47</td>
<td>1.35</td>
</tr>
<tr>
<td>DoD STARBASE Instructors made learning about science, technology, engineering, and math topics fun.</td>
<td>5.37</td>
<td>6.65</td>
<td>1.28</td>
</tr>
<tr>
<td>Teachers at my school talk about why technology is important.</td>
<td>4.07</td>
<td>5.32</td>
<td>1.25</td>
</tr>
<tr>
<td>I like learning how technology works.</td>
<td>5.17</td>
<td>6.41</td>
<td>1.24</td>
</tr>
<tr>
<td>I talk with my family about my plans for the future.</td>
<td>4.71</td>
<td>5.95</td>
<td>1.24</td>
</tr>
<tr>
<td>Learning about science is easy for me.</td>
<td>4.50</td>
<td>5.73</td>
<td>1.23</td>
</tr>
<tr>
<td>Engineers help solve challenging problems.</td>
<td>5.34</td>
<td>6.55</td>
<td>1.21</td>
</tr>
<tr>
<td>I think I will remember enjoying my time at DoD STARBASE.</td>
<td>5.53</td>
<td>6.74</td>
<td>1.21</td>
</tr>
<tr>
<td>Math is important for developing new technology.</td>
<td>5.45</td>
<td>6.65</td>
<td>1.20</td>
</tr>
</tbody>
</table>
Math is really useful for solving engineering problems. 5.36 6.53 1.17
At DoD STARBASE, I learned a lot of things that I can use. 5.64 6.80 1.17
I want to learn more about technology. 5.22 6.37 1.15
I am good at science. 4.73 5.84 1.11
DoD STARBASE is boring. (Reverse Scored) 5.46 6.55 1.09
Scientists work on things that make life better. 5.49 6.52 1.03
Teachers at my school are excited about science. 4.79 5.78 0.99
Most people use science, technology, math or engineering skills every day. 5.64 6.57 0.93
I like doing science experiments. 5.90 6.82 0.92
I am aware of some jobs that use math, science, engineering, or technology. 5.54 6.43 0.89
I do not think DoD STARBASE will help me do better in school. (Reverse Scored) 5.61 6.46 0.85
I like technology. 5.77 6.53 0.76
I am good at math. 5.01 5.67 0.66

(Reverse scored) This item was reverse-scored; therefore, a higher mean average value reflects a more positive attitude.
*All contrasts are significantly different at p < .05 or greater.
Gender Comparisons and Attitudinal Differences

Two sets of analyses compared the responses of boys and girls on the Attitudinal Survey, focusing both on mean total scores and on the item-level differences. Table 24 shows the overall gender differences in responses for both the pre- and post-program surveys. The boys’ attitude scores tended to be higher than girls’ scores in the pre-program assessment (5.70 vs. 5.54, F (1, 1575) = 17.72, p < .0001). Although an attitude difference favoring boys remained at the post-program assessment (5.89 vs. 5.78, F (1, 1618) = 12.52, p < .001), girls had narrowed the gap considerably through an improvement that was 30 percent stronger than boys’ (4.33 percent vs. 3.33 percent). It might be noted that the favorability of girls’ attitudes at the completion of the DoD STARBASE program exceeded that of the boys at the start of the program (5.78 vs. 5.70). These results suggest that the DoD curriculum not only reinforces boys’ favorable disposition towards STEM, but can serve as a valuable correction for the less favorable attitudes about STEM that girls may acquire elsewhere.

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Pre-Program Mean (31 items)</th>
<th>Post-Program Mean (36 items)</th>
<th>Pre-Post Attitude Gap Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>802</td>
<td>5.70 (81.4%)</td>
<td>5.89 (84.1%)</td>
</tr>
<tr>
<td>Girls</td>
<td>771</td>
<td>5.54 (79.1%)</td>
<td>5.78 (82.6%)</td>
</tr>
</tbody>
</table>

*Values in parenthesis expressed the attitude in terms of the percent of maximum attainable scale score.

It should also be noted that boys and girls did not significantly differ on half of the post-program items measuring favorable attitudes about STEM and the DoD STARBASE program (19 of 37). Boys displayed more positive attitudes toward DoD STARBASE and STEM than girls on the 14 items shown by Table 25. These include six items related to engineering (e.g., “I like engineering.”), seven items related to technology (e.g., “I want to learn more about technology.”) and four items related to mathematics (e.g., “I am good at math.”). Boys also scored higher on two items pertaining to the military (e.g., “Military bases are exciting.”). In the foregoing counts, it should be noted that several items mention more than one aspect of STEM, which is why the total exceeds 14.

Girls expressed more positive attitudes than boys on five items, including appreciating their DoD STARBASE experience (“I think almost any kid would have fun learning at DoD STARBASE.”), and spreading the word about the DoD STARBASE program (“I will tell others about my DoD STARBASE experience.”). These outcomes suggest that both genders are deriving useful life lessons from the DoD STARBASE program, as indicated by means that are consistently above the midpoint of the scale. Boys seem to be a bit more appreciative of technology, engineering, math and the military, per se, whereas girls seem to appreciate the active learning aspects of the DoD STARBASE program and seem eager to be advocates for the program. In the future, assessments might be made not only of whether incoming DoD STARBASE students previously heard of the program (see above), but the extent to which DoD STARBASE graduates actively attempted to recruit other students to the program, their success in doing so, and the performance of those recruits.
Gender differences in attitudes were examined in terms of differential experience with military personnel (Table 26). The positive impact of prior exposure to the military did not interact with gender on pre-program attitudes ($F(1, 1,572) = .001$, $p = .97$) or post-program attitudes ($F(1, 1,616) = .07$, $p = .80$). That is, although boys had more favorable attitudes than girls, and those with prior exposure to the military were more favorable than those who did not have prior exposure to the military, the impact of one variable, such as gender, did not influence the impact of the other variable, exposure to the military.

Table 25: Gender Gap Score Differences in Post-Program Attitude Survey Mean Item Scores

<table>
<thead>
<tr>
<th>Attitude Item</th>
<th>Boys’ Mean</th>
<th>Girls’ Mean</th>
<th>B - G Difference*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys More Favorable than Girls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I want to learn more about technology.</td>
<td>6.14</td>
<td>5.58</td>
<td>0.56</td>
</tr>
<tr>
<td>I want to learn more about engineering.</td>
<td>5.67</td>
<td>5.12</td>
<td>0.55</td>
</tr>
<tr>
<td>I am interested in being a scientist or engineer.</td>
<td>4.90</td>
<td>4.36</td>
<td>0.53</td>
</tr>
<tr>
<td>I like engineering.</td>
<td>5.75</td>
<td>5.25</td>
<td>0.50</td>
</tr>
<tr>
<td>I like learning how technology works.</td>
<td>6.12</td>
<td>5.69</td>
<td>0.43</td>
</tr>
<tr>
<td>I like technology.</td>
<td>6.40</td>
<td>5.98</td>
<td>0.42</td>
</tr>
<tr>
<td>Military bases are exciting.</td>
<td>6.15</td>
<td>5.88</td>
<td>0.27</td>
</tr>
<tr>
<td>People who work for the military use technology in their jobs.</td>
<td>6.21</td>
<td>5.96</td>
<td>0.24</td>
</tr>
<tr>
<td>When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.</td>
<td>5.41</td>
<td>5.17</td>
<td>0.24</td>
</tr>
<tr>
<td>Learning about science is easy for me.</td>
<td>5.34</td>
<td>5.10</td>
<td>0.24</td>
</tr>
<tr>
<td>I enjoy learning about science, technology, math, and engineering topics.</td>
<td>5.83</td>
<td>5.60</td>
<td>0.22</td>
</tr>
<tr>
<td>I am good at math.</td>
<td>5.56</td>
<td>5.38</td>
<td>0.18</td>
</tr>
<tr>
<td>I am good at science.</td>
<td>5.51</td>
<td>5.34</td>
<td>0.17</td>
</tr>
<tr>
<td>Jobs that use math, engineering, technology and science are exciting.</td>
<td>5.64</td>
<td>5.47</td>
<td>0.17</td>
</tr>
<tr>
<td>Girls More Favorable than Boys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would be interested in a STARBASE club at my school if it were offered.</td>
<td>5.61</td>
<td>5.80</td>
<td>-0.19</td>
</tr>
<tr>
<td>I think almost any kid would have fun learning at DoD STARBASE.</td>
<td>5.87</td>
<td>6.06</td>
<td>-0.19</td>
</tr>
<tr>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>5.90</td>
<td>6.08</td>
<td>-0.17</td>
</tr>
<tr>
<td>DoD STARBASE Instructors made learning about science, technology, engineering, and math topics fun.</td>
<td>6.15</td>
<td>6.31</td>
<td>-0.15</td>
</tr>
<tr>
<td>I think I will remember enjoying my time at DoD STARBASE.</td>
<td>6.27</td>
<td>6.40</td>
<td>-0.14</td>
</tr>
</tbody>
</table>

*All contrasts are significantly different at $p < .05$ or greater.
Table 26: Prior Experience with the Military and Attitudinal Differences by Gender

<table>
<thead>
<tr>
<th></th>
<th>No Prior Experience with Military</th>
<th>Prior Experience with Military</th>
<th>Difference Between Post-Program Means</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Program Mean</td>
<td>Post-Program Mean</td>
<td>Pre-Program Mean</td>
</tr>
<tr>
<td>Boys</td>
<td>5.59</td>
<td>5.81</td>
<td>5.75</td>
</tr>
<tr>
<td>Girls</td>
<td>5.45</td>
<td>5.72</td>
<td>5.60</td>
</tr>
</tbody>
</table>

Impact of Students’ Grade Level

In the 2018 sample, 98 percent of students were in the 5th Grade, and 2 percent were in the 6th Grade. With a homogenous sample having little variance in grade level, few relationships were expected.

Table 27 presents the statistically significant correlations between a student’s grade level and Attitudinal Survey item responses. The magnitudes of the relationships are all small, and thus explain only a slight portion of the differences among students’ attitudes toward STEM and DoD STARBASE. The observed statistical significance is due mostly to the large sample size, which increases the power and sensitivity of the analysis to detect trends that may have limited practical importance. This may especially be the case considering the narrow range of observed values. Indeed, 5 out of every 100 correlations may be significant by chance at an alpha of p = .05, so 3 of the 6 obtained significant correlations found in the 68 statistical tests performed may not replicate in another sample.

At the pre-program assessment, there were no significant relationships on 28 of the 31 attitude items. Yet in the pretest assessment, students in the higher grade were more likely to say that “Teachers at my school are excited about science.” (r = .06, p < .02) and “A lot of good jobs use math to solve problems.” (r = .05, p < .04), while less likely to report “I would be interested in a DoD STARBASE club at my school if it were offered.” (r = -.07, p < .009) than their younger peers.

At the post-program assessment, students from a lower grade level once again conveyed more interest in participating in a DoD STARBASE club (r = -.08, p < .002), indicated more appreciation for empirical methodology in their endorsement of “I like doing science experiments.” (r = -.07, p < .007) and support for the program “At DoD STARBASE, I learned a lot of things that I can use.” (r = -.09, p < .001) than those in a higher grade. These results provide some indication that lower grade level students conclude their DoD STARBASE experience with slightly more positive views than students in a higher-grade level. This suggests the value in continuing to focus on students at the 5th Grade level, who can benefit most from their early positive experiences at DoD STARBASE.
Table 27: Correlation of Student Grade Level with Pre- and Post-Program Attitudinal Responses

<table>
<thead>
<tr>
<th>Item</th>
<th>r with Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers at my school are excited about science. (Pre-)</td>
<td>.058*</td>
</tr>
<tr>
<td>A lot of good jobs use math to solve problems. (Pre-)</td>
<td>.052*</td>
</tr>
<tr>
<td>I would be interested in a STARBASE club at my school if it were offered. (Pre-)</td>
<td>-.066**</td>
</tr>
<tr>
<td>I like doing science experiments. (Post-)</td>
<td>-.067**</td>
</tr>
<tr>
<td>I would be interested in a STARBASE club at my school if it were offered. (Post-)</td>
<td>-.076**</td>
</tr>
<tr>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>-.085**</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed).  ** Correlation is significant at the 0.01 level (2-tailed).

NOTE: Positive values indicate increasing favorability with higher grade level, vice versa for negative values.

Empirical Confirmation of Attitude Dimensions

Beginning in 2015, the attitude items were subjected to principal components analysis (PCA), a standard data reduction method with student response data. In a PCA analysis, items are correlated with statistically derived factors, or dimensions, that provide the simplest description of the patterns of interrelationships observed in the data. As a result of this empirical confirmation, seven conceptual factors were derived in 2015, for which the definitions are provided below.

The results obtained in 2015 were clearly replicated in 2016. In 2017, despite some item modifications, six of the seven factors replicated. The 2015-16 factor of Math Confidence, however, was replaced by a factor called “Teacher Support” in 2017, which is replicated in 2018. The specific items and the results of the PCA analysis for 2015-18 are presented in the appendix. The correlation between the loadings across the seven comparable 2017 and 2018 factors is \( r = .87, p < .001 \), indicating solid structural consistency.

Also, similar to prior outcomes, each of the seven Attitude Dimensions in 2018 is sufficiently reliable for program evaluation based on Cronbach’s \( \alpha \), a statistical index of measurement consistency and coherence. The scale reliability for the Military Setting Endorsement and Teacher Support for STEM dimensions are lower than the other dimension in reliability because those composite scores are based on a small number of heterogeneous items. Teacher Support is defined by only two items and was part of Military Setting Endorsement in 2016. An alpha reliability outcome of just under .60 for this dimension’s scale is adequate evidence of item cohesion upon which to make general outcome comparisons.

- **STEM Concept Awareness** – Recognition of the value of technology in everyday life. (3 items, \( \alpha = .83 \))
- **Future Planning** – Expression of interest in future careers and taking relevant classes, especially in STEM. (6 items, \( \alpha = .88 \))
- **Science Confidence** – Appreciation for science and a positive view of one’s capacity for learning science. (4 items, \( \alpha = .80 \))
- **STEM Behavior & Motivation** – Identification with the importance of STEM and the roles of engineers and scientists in solving problems and improving life. (9 items, \( \alpha = .79 \))
• **Military Setting Endorsement** – Positive impressions about enjoying military facilities and the diversity of work activities done by people on military bases. (4 items, $\alpha = .73$)

• **Teacher Support for STEM** – Teachers emphasize the value of science and technology. (2 items, $\alpha = .59$)

• **DoD STARBASE Program Evaluation** – Positive rating of the impact of the DoD STARBASE program on learning and enthusiasm to convey that to others. (8 items, $\alpha = .88$)

Contrast analyses were performed between the seven pre- and post-program assessments of the 2018 Attitude Dimensions (Table 28). As with the trends observed for the individual attitude items presented in Table 14, there were increases in favorability on the dimension scores from pre-program to post-program. All seven differences were statistically significant, especially Future Planning, STEM Behavior and Motivation, Military Setting Endorsement and Science Confidence. The outcomes using the Attitude Dimensions further substantiate the impressions suggested by other analyses of the individual items; namely, that the DoD STARBASE program continues to succeed in its intended mission to have a positive, beneficial impact on students’ attitudes toward STEM learning activities, their interest in a career in STEM, and their appreciation of the activities observed in a military setting.

**Table 28: Pre-Program and Post Program Attitudinal Dimension Scores**

<table>
<thead>
<tr>
<th>Attitude Dimension</th>
<th>Pre-Program</th>
<th>Post-Program</th>
<th>Gap**</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM Concept Awareness</td>
<td>5.94</td>
<td>6.00</td>
<td>0.06**</td>
</tr>
<tr>
<td>Future Planning</td>
<td>5.13</td>
<td>5.36</td>
<td>0.23**</td>
</tr>
<tr>
<td>Science Confidence</td>
<td>5.54</td>
<td>5.73</td>
<td>0.19**</td>
</tr>
<tr>
<td>STEM Behavior &amp; Motivation</td>
<td>5.81</td>
<td>6.04</td>
<td>0.23**</td>
</tr>
<tr>
<td>Military Setting Endorsement</td>
<td>5.78</td>
<td>6.01</td>
<td>0.23**</td>
</tr>
<tr>
<td>Teacher Support for STEM</td>
<td>4.98</td>
<td>5.06</td>
<td>0.08**</td>
</tr>
<tr>
<td>DoD STARBASE Program Evaluation (2 items pre-, 8 items post-)</td>
<td>5.91</td>
<td>6.11</td>
<td>0.20**</td>
</tr>
</tbody>
</table>

**All differences are significant at the 0.01 level (2-tailed).**

Analyses assessing gender differences were also conducted on post-program Attitude Dimension scores (Table 29). At the end of the DoD STARBASE program, boys’ Attitude Dimension scores exceeded girls’ scores on STEM Concept Awareness, Future Planning, and Military Setting Endorsement. Perhaps more noteworthy is the finding that girls were not significantly different from boys on Science Confidence, STEM Behavior and Motivation, and perceptions of Teachers’ Support for STEM. It also should be noted that girls exceeded boys in their favorable DoD STARBASE Program Evaluation.
Attitude Relations of Discussing Future Plans with Family

A trial attitude item for 2017-18 asked students about the extent to which they talk to their family about their plans for the future. More affirmative responses to that item were associated with higher total attitude scores, both pre-program and post-program. In addition, a student who talks to family members about his or her future plans had significantly more favorable scores on each of the Attitude Dimensions, especially pre-program STEM Behavior and Motivation, and post-program Military Setting Endorsement as demonstrated by Table 30.

Table 29: Gender Gap Score Differences in Post-Program Attitude Dimension Scores

<table>
<thead>
<tr>
<th>Attitude Dimension</th>
<th>Girls’ Mean</th>
<th>Boys’ Mean</th>
<th>B - G Difference</th>
<th>Statistical Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM Concept Awareness</td>
<td>5.76</td>
<td>6.22</td>
<td>0.46</td>
<td>.0001</td>
</tr>
<tr>
<td>Future Planning</td>
<td>5.16</td>
<td>5.53</td>
<td>0.37</td>
<td>.0001</td>
</tr>
<tr>
<td>Science Confidence</td>
<td>5.68</td>
<td>5.76</td>
<td>0.09</td>
<td>.11</td>
</tr>
<tr>
<td>STEM Behavior &amp; Motivation</td>
<td>6.01</td>
<td>6.04</td>
<td>0.03</td>
<td>.45</td>
</tr>
<tr>
<td>Military Setting Endorsement</td>
<td>5.93</td>
<td>6.06</td>
<td>0.13</td>
<td>.005</td>
</tr>
<tr>
<td>Teacher Support for STEM</td>
<td>5.08</td>
<td>5.03</td>
<td>-0.05</td>
<td>.48</td>
</tr>
<tr>
<td>DoD STARBASE Program Evaluation</td>
<td>6.18</td>
<td>6.05</td>
<td>-0.14</td>
<td>.01</td>
</tr>
</tbody>
</table>

Table 30: Correlation of Attitude Dimension Scores and Discussing Future Plans with Family

<table>
<thead>
<tr>
<th>Attitude Dimension</th>
<th>Pre-Program</th>
<th>Post-Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Attitudes</td>
<td>.299**</td>
<td>.236**</td>
</tr>
<tr>
<td>STEM Concept Awareness</td>
<td>.151**</td>
<td>.128**</td>
</tr>
<tr>
<td>Future Planning</td>
<td>.214**</td>
<td>.152**</td>
</tr>
<tr>
<td>Science Confidence</td>
<td>.197**</td>
<td>.171**</td>
</tr>
<tr>
<td>STEM Behavior &amp; Motivation</td>
<td>.237**</td>
<td>.188**</td>
</tr>
<tr>
<td>Military Setting Endorsement</td>
<td>.227**</td>
<td>.211**</td>
</tr>
<tr>
<td>Teacher Support for STEM</td>
<td>.201**</td>
<td>.168**</td>
</tr>
<tr>
<td>DoD STARBASE Program Evaluation</td>
<td>.180**</td>
<td>.191**</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).
Drivers of Target Student Attitudes

Multiple regression analyses were conducted to determine a set of non-overlapping statistical predictors for six important student target attitudes. These predictors, or drivers, are rank-ordered in Table 31 by increasing relative impact of the driver attitude on the target attitude. The results indicate that if the conditions in each list are present (that is, more favorable attitudes are expressed), it is very likely the target attitude also will be present and operative in student tendencies.

The Adjusted R2 values indicate the cumulative amount of the variance, or variability, across students in their attitudes about DoD STARBASE and STEM-related topics that the drivers explain. That is, these attitude items predict student feelings about particular aspects of the DoD STARBASE program with an increasing degree of accuracy. Each of the individual predictors also is statistically significant in its own right. Thus, they provide a condensed model toward understanding what makes students more enthusiastic about the program and about STEM. These lists can be used as prioritized action items for improving the particular target attitude.

Considerations Based on Drivers

There are repeating drivers that appear to have a broad impact on the target attitudes. Nine drivers each impacted three of the six target attitudes:

- A military base is a good place to work.
- People who work for the military use technology in their jobs.
- I like engineering.
- I want to learn more about engineering.
- Math is really useful for solving engineering problems.
- Scientists work on things that make life better.
- I think I will remember enjoying my time at DoD STARBASE.
- At DoD STARBASE, I learned a lot of things that I can use.
- I will tell others about my DoD STARBASE experience.

Eleven additional drivers affected two target attitudes:

- Military bases are exciting.
- People who work for the military do lots of different things.
- I would like to know more about science.
- I would be interested in a STARBASE club at my school if it were offered.
- Most people use science, technology, math, or engineering skills every day.
- I enjoy learning about science, technology, math, and engineering topics.
- I like learning how technology works.
- A lot of good jobs use math to solve problems.
- I talk with my family about my plans for the future.
- DoD STARBASE is boring. (Reverse Scored)
- I think almost any kid would have fun learning at DoD STARBASE.

“My favorite part of DoD STARBASE was the rover challenge, because I got to interact with my team and used technology while seeing the rover move when it followed the code! I learned that STEM takes a lot of hard work!”

- STUDENT AT LESTER PARK ELEMENTARY, ATTENDING STARBASE MINNESOTA-DULUTH
These outcomes suggest that DoD STARBASE instructors should continue to stress the value of science, should continue to make learning fun, and should continue to emphasize the positive features of military bases. Other drivers of student attitudes, such as liking science, and wanting to learn more about engineering and technology, are important predictors, too, but may follow from the more potent predictors. To the extent that academies are able to create a stimulating, rewarding and supportive learning environment, positive student attitudes can be enhanced and reinforced, which may pay continuing dividends after DoD STARBASE attendance. These desirable outcomes include:

- word of mouth endorsement,
- further pursuit of learning about technology,
- STEM career motivation, and
- support for the military, such as possible future enlistment.

“As an elementary school teacher, I want to convey how essential this program has been in helping me impart critical 5th grade science concepts. This unique program provides my students with hands-on science experiences that they cannot get in the regular classroom. The students that I serve come from very diverse backgrounds and includes an alarming number of students who are homeless, have incarcerated parents, or have experienced the trauma or some other form of family turmoil. These students typically do not participate in activities this rich in content and because of their socio-economic backgrounds, do not have the resources to seek out academic enrichment programs similar to DoD STARBASE. The science the 5th graders are exposed to at DoD STARBASE contributes to positive attitudes about school, increased self-confidence and self-esteem, and better attendance. I have seen a direct correlation between attendance at DoD STARBASE and scores that meet and exceed benchmarks on state standardized science tests. Students are immersed in Science, Technology, Engineering and Math for five full days. Students leave DoD STARBASE with the empowering feeling that college and careers in STEM fields are well within their grasp.”

- TERI GRIFFIN, EDUCATOR AT FAUBION ELEMENTARY, ATTENDING STARBASE PORTLAND
### Table 31: Drivers of Key Target Attitudes (Post-Program Responses)

<table>
<thead>
<tr>
<th>Target Attitude</th>
<th>Drivers of Target Attitude</th>
<th>Adjusted R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>DoD STARBASE Instructors made learning about science, technology, engineering, and math topics fun.</td>
<td>0.321</td>
</tr>
<tr>
<td></td>
<td>Learning about science, engineering, technology, and math will help me in my daily life.</td>
<td>0.388</td>
</tr>
<tr>
<td></td>
<td>I think I will remember enjoying my time at DoD STARBASE.</td>
<td>0.421</td>
</tr>
<tr>
<td></td>
<td>I do not think DoD STARBASE will help me do better in school. (Reverse Scored)</td>
<td>0.439</td>
</tr>
<tr>
<td></td>
<td>I like learning how technology works.</td>
<td>0.448</td>
</tr>
<tr>
<td></td>
<td>I think almost any kid would have fun learning at DoD STARBASE.</td>
<td>0.455</td>
</tr>
<tr>
<td></td>
<td>A military base is a good place to work.</td>
<td>0.461</td>
</tr>
<tr>
<td></td>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>0.465</td>
</tr>
<tr>
<td></td>
<td>A lot of good jobs use math to solve problems.</td>
<td>0.467</td>
</tr>
<tr>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>DoD STARBASE is boring. (Reverse Scored)</td>
<td>0.469</td>
</tr>
<tr>
<td></td>
<td>I want to learn more about technology.</td>
<td>0.470</td>
</tr>
<tr>
<td></td>
<td>I like engineering.</td>
<td>0.471</td>
</tr>
<tr>
<td></td>
<td>Math is really useful for solving engineering problems.</td>
<td>0.473</td>
</tr>
<tr>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>DoD STARBASE Instructors made learning about science, technology, engineering, and math topics fun.</td>
<td>0.236</td>
</tr>
<tr>
<td></td>
<td>I talk with my family about my plans for the future.</td>
<td>0.298</td>
</tr>
<tr>
<td></td>
<td>I think almost any kid would have fun learning at DoD STARBASE.</td>
<td>0.337</td>
</tr>
<tr>
<td></td>
<td>I think I will remember enjoying my time at DoD STARBASE.</td>
<td>0.353</td>
</tr>
<tr>
<td></td>
<td>I would be interested in a STARBASE club at my school if it were offered.</td>
<td>0.360</td>
</tr>
<tr>
<td></td>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>0.364</td>
</tr>
<tr>
<td></td>
<td>Math is important for developing new technology.</td>
<td>0.367</td>
</tr>
<tr>
<td></td>
<td>I am interested in being a scientist or engineer.</td>
<td>0.370</td>
</tr>
<tr>
<td></td>
<td>I would like to know more about science.</td>
<td>0.372</td>
</tr>
<tr>
<td></td>
<td>People who work for the military use technology in their jobs.</td>
<td>0.374</td>
</tr>
</tbody>
</table>
## Table 31: Drivers of Key Target Attitudes (Post-Program Responses), cont.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I want to learn more about technology.</strong></td>
<td>I like learning how technology works.</td>
<td>0.466</td>
</tr>
<tr>
<td></td>
<td>I like technology.</td>
<td>0.533</td>
</tr>
<tr>
<td></td>
<td>I want to learn more about engineering.</td>
<td>0.584</td>
</tr>
<tr>
<td></td>
<td>I would like to know more about science.</td>
<td>0.589</td>
</tr>
<tr>
<td></td>
<td>Jobs that use math, engineering, technology and science are exciting.</td>
<td>0.590</td>
</tr>
<tr>
<td></td>
<td>Scientists work on things that make life better.</td>
<td>0.592</td>
</tr>
<tr>
<td></td>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>0.593</td>
</tr>
<tr>
<td></td>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>0.594</td>
</tr>
<tr>
<td></td>
<td>I am aware of some jobs that use math, science, engineering, or technology.</td>
<td>0.595</td>
</tr>
<tr>
<td><strong>I am interested in being a scientist or engineer.</strong></td>
<td>When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.</td>
<td>0.360</td>
</tr>
<tr>
<td></td>
<td>I want to learn more about engineering.</td>
<td>0.479</td>
</tr>
<tr>
<td></td>
<td>I enjoy learning about science, technology, math, and engineering topics.</td>
<td>0.493</td>
</tr>
<tr>
<td></td>
<td>I am good at science.</td>
<td>0.500</td>
</tr>
<tr>
<td></td>
<td>I would be interested in a STARBASE club at my school if it were offered.</td>
<td>0.506</td>
</tr>
<tr>
<td></td>
<td>Most people use science, technology, math or engineering skills every day.</td>
<td>0.509</td>
</tr>
<tr>
<td></td>
<td>I like engineering.</td>
<td>0.513</td>
</tr>
<tr>
<td></td>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>0.515</td>
</tr>
<tr>
<td></td>
<td>Scientists work on things that make life better.</td>
<td>0.516</td>
</tr>
<tr>
<td></td>
<td>Military bases are exciting.</td>
<td>0.518</td>
</tr>
<tr>
<td></td>
<td>People who work for the military do lots of different things.</td>
<td>0.519</td>
</tr>
<tr>
<td><strong>Military bases are exciting.</strong></td>
<td>A military base is a good place to work.</td>
<td>0.292</td>
</tr>
<tr>
<td></td>
<td>I think I will remember enjoying my time at DoD STARBASE.</td>
<td>0.348</td>
</tr>
<tr>
<td></td>
<td>People who work for the military do lots of different things.</td>
<td>0.376</td>
</tr>
<tr>
<td></td>
<td>I enjoy learning about science, technology, math, and engineering topics.</td>
<td>0.398</td>
</tr>
<tr>
<td></td>
<td>I like engineering.</td>
<td>0.404</td>
</tr>
<tr>
<td></td>
<td>People who work for the military use technology in their jobs.</td>
<td>0.408</td>
</tr>
<tr>
<td></td>
<td>A lot of good jobs use math to solve problems.</td>
<td>0.412</td>
</tr>
<tr>
<td></td>
<td>DoD STARBASE is boring. (Reverse Scored),</td>
<td>0.416</td>
</tr>
<tr>
<td></td>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>0.417</td>
</tr>
<tr>
<td></td>
<td>Math is really useful for solving engineering problems.</td>
<td>0.419</td>
</tr>
<tr>
<td></td>
<td>Scientists work on things that make life better.</td>
<td>0.420</td>
</tr>
<tr>
<td></td>
<td>I am interested in being a scientist or engineer.</td>
<td>0.422</td>
</tr>
</tbody>
</table>
Table 31: Drivers of Key Target Attitudes (Post-Program Responses), cont.

<table>
<thead>
<tr>
<th>Military people do lots of different things.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>People who work for the military use technology in their jobs.</td>
<td>0.190</td>
</tr>
<tr>
<td>Military bases are exciting.</td>
<td>0.253</td>
</tr>
<tr>
<td>Most people use science, technology, math or engineering skills every day.</td>
<td>0.274</td>
</tr>
<tr>
<td>A military base is a good place to work.</td>
<td>0.292</td>
</tr>
<tr>
<td>A lot of good jobs use math to solve problems.</td>
<td>0.298</td>
</tr>
<tr>
<td>I want to learn more about engineering.</td>
<td>0.303</td>
</tr>
<tr>
<td>Engineers help solve challenging problems.</td>
<td>0.307</td>
</tr>
<tr>
<td>I talk with my family about my plans for the future.</td>
<td>0.310</td>
</tr>
<tr>
<td>Math is really useful for solving engineering problems.</td>
<td>0.312</td>
</tr>
</tbody>
</table>

“The future of teaching is now. With 3-D printers, computer software, robotics, etc. and brilliant instructors, DoD STARBASE is leading the way to help our children get interested in STEM.”

- ERIC ENGLEHORN, PARENT OF A STUDENT AT OAK POINT ELEMENTARY, ATTENDING STARBASE MINNESOTA-ST. PAUL
Assessment of Student Knowledge and Skills

The student knowledge and skills assessment include 17 multiple choice items plus one listing item that were categorized in terms of the DoD STARBASE curriculum area that they most closely measure. Table 32 reports the Knowledge Test items sorted into the specific curriculum areas. Only the item topics are presented here; for the complete list of items with their response options, the Student Assessment is available as a separate document upon request.

Table 32: Knowledge Questions by Curriculum Area

<table>
<thead>
<tr>
<th>Chemistry Science (E3.1.1.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item #</td>
</tr>
<tr>
<td>1   NaCl Bond</td>
</tr>
<tr>
<td>5   Composition of air pie chart</td>
</tr>
<tr>
<td>10  Example of physical change</td>
</tr>
<tr>
<td>14  States of matter</td>
</tr>
<tr>
<td>16  Hydrophobic surface</td>
</tr>
<tr>
<td>Engineering (E3.1.1.4)</td>
</tr>
<tr>
<td>2   3D Model</td>
</tr>
<tr>
<td>3   Prototype use</td>
</tr>
<tr>
<td>9   A,B,C,D coordinates</td>
</tr>
<tr>
<td>11  CAD software first step</td>
</tr>
<tr>
<td>Mathematics Operations &amp; Applications (E3.1.1.5)</td>
</tr>
<tr>
<td>6   Nanometers</td>
</tr>
<tr>
<td>8   Reason to use latitude and longitude</td>
</tr>
<tr>
<td>12  Best tool for measuring glass of milk</td>
</tr>
<tr>
<td>15  Towel experiment</td>
</tr>
<tr>
<td>Physics (E3.1.1.1)</td>
</tr>
<tr>
<td>7   Bernoulli Principle</td>
</tr>
<tr>
<td>13  Newton’s law with seat belts</td>
</tr>
<tr>
<td>Technology (E3.1.1.3)</td>
</tr>
<tr>
<td>4   Cell phone touch screen</td>
</tr>
<tr>
<td>17  Locating friend’s house</td>
</tr>
<tr>
<td>STEM Job Awareness</td>
</tr>
<tr>
<td>18*  Who uses STEM concepts in their job? (Select all that apply)</td>
</tr>
</tbody>
</table>

*Item 18 assesses “STEM Job Awareness” by presenting 25 different occupations to students and asking them to select all the jobs that utilize STEM concepts. Results from Item 18 are not included in the Knowledge Test Mean, which is based on the percent of correct answers to the 17 Knowledge questions. Results from Item 18 are detailed in Table 32.

“This opportunity exceeded all of our students’ expectations. Friendly, caring, and kind staff makes for an experience of a lifetime that some of our students may not have been able to experience otherwise.”

- BOBBI SPANARD, EDUCATOR AT COLUMBIA ELEMENTARY, ATTENDING STARBASE PETERSON
Increases in Knowledge Scores by Curriculum Area

Knowledge scores are calculated in terms of the percentage correct of the 17 items, as well as the percentage correct within the curriculum area. Table 33 shows the pre- and post-program assessment mean score in total and by curriculum area. Total knowledge scores went up by 36 percent, which represents a relative improvement of 83.0 percent. All categories, especially Physics (+46 percent), Chemistry (+38 percent), and Mathematics (+26 percent), showed significant increases post-program as compared to responses prior to participation in DoD STARBASE. The smallest post-program increases were in Engineering (+22 percent), Technology (+19 percent), and STEM Job Awareness (+16 percent), which were nonetheless significant improvements and greater improvements than seen in 2017.

Table 33: Pre/Post Knowledge Percent Correct Scores by Curriculum Area

<table>
<thead>
<tr>
<th>Curriculum Area</th>
<th># of Items</th>
<th>Pre-Program Percent Score</th>
<th>Post-Program Percent Score*</th>
<th>Gap*** (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Items Total</td>
<td>17</td>
<td>36.48%</td>
<td>66.75%</td>
<td>30.27***</td>
</tr>
<tr>
<td>Chemistry</td>
<td>5</td>
<td>33.61%</td>
<td>72.03%</td>
<td>38.42***</td>
</tr>
<tr>
<td>Engineering</td>
<td>4</td>
<td>37.92%</td>
<td>60.21%</td>
<td>22.29***</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
<td>46.67%</td>
<td>72.64%</td>
<td>25.97***</td>
</tr>
<tr>
<td>Physics</td>
<td>2</td>
<td>21.21%</td>
<td>66.72%</td>
<td>45.50***</td>
</tr>
<tr>
<td>Technology</td>
<td>2</td>
<td>35.65%</td>
<td>54.86%</td>
<td>19.21***</td>
</tr>
<tr>
<td>STEM Job Awareness</td>
<td>25</td>
<td>42.06%</td>
<td>57.91%</td>
<td>15.85***</td>
</tr>
</tbody>
</table>

* All subtotal post-program means are statistically significantly higher than pre-program means, p < .001

Table 34 presents the pre- and post-program mean scores, percent correct, and gap differences for the knowledge assessment since 2014. In 2011 and in 2015, the content of the Knowledge Test was updated based on curriculum changes throughout the DoD STARBASE program to align with STEM National Standards. The assessment began measuring new concepts that were more challenging to the students, resulting in lower scores overall. The content changes implemented in 2011 were carried through to 2018, including the replacement of simple knowledge items by problem-solving application items. For example, instead of asking students to recall specific facts regarding the learning activity, the 2012-2018 assessments presented students with situations where they must apply the principles learned in order to answer the question from the facts provided. As a consequence of the difficulty of such questions, the 2014-2018 pre-test scores shown are consistently below 50 percent correct.

When comparing year-to-year results, it is important to keep in mind that the number of items on the Knowledge Test has fluctuated slightly through the years. This is because the assessment is evaluated annually to ensure all items on the assessment are showing statistical evidence of being effective, and the content is aligned to the current objectives of the DoD.
STARBASE program. This is important because the number of items on the Knowledge Test directly impacts the gap score potential since the pre- to post-test differences on each item contribute to the overall gap measurement (more items = more gap potential). As such, it is not a concern that the gap score may be higher or lower in a given year; what is central to Table 34 is that there is a demonstrable and significant increase in student knowledge as a result of attending DoD STARBASE. This acquisition of knowledge is indicated by the post-program average number of correct responses, which has consistently resulted in post-test mean scores that show most questions are answered correctly (i.e., average of 67 percent correct in 2016-2018 despite items that were more difficult, as indicated by the pre-test scores). The appendix extends Table 34 by presenting comparable information on an item-by-item basis.

| Table 34: Pre/Post Knowledge Test Mean Total Scores and Percent Correct (2014 - 18) |
|---|---|---|---|---|---|
| Year | 2014 | 2015 | 2016 | 2017 | 2018 |
| # of Items | 27 | 17 | 17 | 18 | 17 |
| Pre-Program Score | 12.42 (46.0) | 7.62 (44.8) | 7.44 (43.8) | 7.33 (40.87) | 6.20 (36.47) |
| Post-Program Score | 17.56 (65.0) | 12.88 (78.1) | 11.73 (69.0) | 12.33 (68.47) | 11.34 (66.70) |
| Gap | +5.14 (19) | +4.47 (26.3) | +4.29 (25.2) | +5.00 (27.61) | +5.14 (37.23) |

Knowledge Test Scores as a Function of Geographic Region

Students’ attitudes concerning STEM and their prior experience with the DoD STARBASE program and with the military varied in terms of their geographic region. Table 35 examines whether region also was related to performance on the Knowledge Test. There were significant performance differences amongst regions in both the pre-program (F (4,1619) = 16.30, p < .0001) and post-program assessments (F (4,1618) = 2.96, p < .02). The Southeast Region, for example, scored highest on both the pre-test and the post-test Knowledge Tests. Yet other regions did a commendable job of catching up, with each one showing more improvement in knowledge scores than the Southeast. In fact, the West Region, with the lowest pre-test Knowledge average score, showed the most knowledge improvement of all regions.

| Table 35: Pre-Program and Post-Program Knowledge Test Performance by Region |
|---|---|---|---|---|---|
| Region | Pre-Program Mean | Pre-Program Rank | Post-Program Mean | Post-Program Rank | Percent Change* | Change Rank* |
| East | 5.72 | 4.00 | 10.74 | 5.00 | 29.51 | 4.00 |
| Midwest | 6.21 | 2.00 | 11.30 | 2.00 | 30.02 | 3.00 |
| South | 5.91 | 3.00 | 11.27 | 3.00 | 31.52 | 2.00 |
| Southeast | 7.09 | 1.00 | 11.81 | 1.00 | 27.77 | 5.00 |
| West | 5.66 | 5.00 | 11.17 | 4.00 | 32.40 | 1.00 |

*Rank based on relative pre-test to post-test knowledge mean score change.
Knowledge Test Scores as a Function of Military Attitudes

Performance on the Knowledge Test was examined as a function of high and low military attitudes. Table 36 shows that those with high military attitude and those with low military attitude scores did not significantly differ in their pre-program mean knowledge ($F(1, 775) = 0.20, p = .73$). In the post-program assessment, by contrast, those with high military attitudes displayed a stronger performance than those with low military attitudes ($F(1, 775) = 6.96, p < .008$). Both the low and high military attitude groups had significant gains in knowledge scores pre- to post-program ($F(1, 775) = 8,506.89, p < .0001$), but the high military attitude score group showed significantly greater improvement ($+5.36$ vs. $+4.33$, $F(1, 775) = 3.85, p = .05$). This finding suggests that students who are more favorably disposed toward the military context of the DoD STARBASE program tend to be more highly engaged with learning about STEM principles and concepts in an applied military setting.

When analyzed in terms of the five Regions, there was a modest correlation between students’ pre-program attitude scores and post-program knowledge scores, but this was not significant ($r = .26, p = .67$) due to low statistical power. The correlation between students’ pre-program attitude scores and their post-program knowledge scores was significant when analyzed at the individual level ($r = .13, p < .0001$), suggesting that variables that may influence student attitudes, including geographic region and access to military personnel and past DoD STARBASE graduates, are important to track in future years.

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Pre-Program Mean</th>
<th>Std. Deviation</th>
<th>Post-Program Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Military Attitude</strong></td>
<td>517</td>
<td>6.03</td>
<td>2.63</td>
<td>11.39*</td>
</tr>
<tr>
<td><strong>Low Military Attitude</strong></td>
<td>216</td>
<td>6.00</td>
<td>2.54</td>
<td>10.73*</td>
</tr>
</tbody>
</table>

* Significant increase in post-program means.

Gender Differences on Knowledge Test

Table 37 presents the pre- and post-program scores and gap differences between Knowledge Test scores based on gender. Similar to several prior years, the pre-program knowledge score was significantly higher for boys than for girls. Although boys’ knowledge scores were 7 percent higher than girls at the pre-program assessment ($6.41$ vs. $5.99, F(1, 1,621) = 10.84, p < .001$), the gap had been cut by 77 percent, to just 1.1 percent higher by the post-program assessment and was no longer significant ($11.43$ vs. $11.25; F(1, 1,620) = 1.29, p = .26$). The knowledge increase from pre- to post-program is significant for both boys and girls.

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Pre-Program Score (Percent)</th>
<th>Post-Program Score (Percent)</th>
<th>Performance Gap Score (Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boys</strong></td>
<td>828</td>
<td>6.41 (37.7)</td>
<td>11.43 (67.3)</td>
</tr>
<tr>
<td><strong>Girls</strong></td>
<td>784</td>
<td>5.99 (35.2)</td>
<td>11.25 (66.2)</td>
</tr>
</tbody>
</table>

* Significant difference between pre-program score and post-program scores.
The differences in gap scores between girls and boys from 2014 to 2018 range from the smallest absolute difference of .07 in 2014 to the largest absolute difference of .33 in 2015 (see Table 38). Girls typically demonstrated greater improvement and obtained larger gap scores than boys across the years. In 2018, the girls obtained their highest improvement so far, consistent with the conclusion that both genders improved in knowledge of STEM concepts as a function of the DoD STARBASE program.

Table 38: Gender Performance Gap Scores (2014 - 2018) on Knowledge Test (Pre-Program vs. Post-Program)

<table>
<thead>
<tr>
<th>Gender</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Items</td>
<td>27</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>17</td>
</tr>
<tr>
<td>Boys</td>
<td>+5.10</td>
<td>+4.31</td>
<td>+4.25</td>
<td>+4.84</td>
<td>+5.02</td>
</tr>
<tr>
<td>Girls</td>
<td>+5.17</td>
<td>+4.64</td>
<td>+4.33</td>
<td>+5.10</td>
<td>+5.26</td>
</tr>
<tr>
<td>Difference</td>
<td>+.07</td>
<td>+.33</td>
<td>+.08</td>
<td>+.26</td>
<td>+.24</td>
</tr>
</tbody>
</table>

Prior Military Exposure and Gender Effects on Knowledge

There was a direct effect of gender on pre-program knowledge scores ($F (1, 1619) = 4.26, p < .0008$) and a direct effect of prior exposure to the military ($F (1, 1619) = 62.92, p < .0001$), such that boys and those with prior exposure to the military performed better on the pre-test. However, there was not a statistically significant interaction effect between gender and exposure ($F (1, 1619) = 3.51, p < .06$) on pre-program knowledge scores. After the program, there was a significant direct effect of prior exposure to the military on post-program knowledge scores ($F (1, 1619) = 74.85, p < .001$), but not of gender on post-program knowledge scores ($F (1, 1619) = 0.004, p < .95$) nor any interaction between gender and prior exposure ($F (1, 1619) = 2.12, p = .15$). This pattern of results, shown in Table 39, suggests that individual differences in either prior exposure to the military or gender could influence knowledge scores, but the positive impact of those factors may not accumulate or build on each other. Put simply, both boys and girls with prior exposure to the military were at greater advantage in STEM knowledge at the post-test following the DoD STARBASE program.

Table 39: Prior Experience with the Military and Knowledge Differences by Gender

<table>
<thead>
<tr>
<th>No Prior Experience with Military</th>
<th>Prior Experience with Military</th>
<th>Difference Between Pre-Program Means</th>
<th>Difference Between Post-Program Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Program Mean</td>
<td>Post-Program Mean</td>
<td>Pre-Program Mean</td>
<td>Post-Program Mean</td>
</tr>
<tr>
<td>Boys</td>
<td>5.54</td>
<td>10.28</td>
<td>6.82</td>
</tr>
<tr>
<td>Girls</td>
<td>5.51</td>
<td>10.52</td>
<td>6.30</td>
</tr>
</tbody>
</table>
Family Discussion of Future Plans – Relation to Knowledge

Earlier, it was reported that students who talked to their family about their plans for the future tended to have more positive pre-program and post-program attitudes about STEM, the DoD STARBASE program and the military. In this section, we examine the relation of talking to one’s family about future plans to pre-program and post-program knowledge scores.

A greater agreement with the item assessing talking to one’s family about future plans was actually negatively associated with performance on the pre-program knowledge assessment ($r = -.07, p < .001$). Further inspection of the data, however, indicated a curvilinear relationship, such that pre-program performance was higher with moderate amounts of family discussion, and was lower with either very little or very much talk about the future. It is possible that a moderate amount of family discussion leads to optimal student motivation, while too little talk leads to indifference and too much talk leads to anxiety, both of which may be counterproductive to knowledge acquisition and performance. Figure 2 illustrates the curvilinear relationship of overall Knowledge Test post-program scores and average rating for the reported behavior.

Figure 2: Relationship of Talking with Family About Future Plans and Knowledge Pre-Test Score
Reports of talking to one’s family about the future did not change from pre-program to post-program attitude assessments (5.41 vs. 5.43, t (1,559) = 0.48, p = .67). As well, the correlation for post-program assessment of talking to one’s family about the future was not significantly correlated with performance on the post-program Knowledge Test (\( r = .001, p = .96 \)). Yet a post-program assessment of more talk with the family about plans for the future did correlate slightly with more improvement in knowledge scores (\( r = .08, p = .001 \)); this relation was particularly apparent when a student chose “3” in response to either the pre-program or post-program assessment for talking to the family about future plans. Figure 3 shows this “bump” in the otherwise gently rising pattern across increasing endorsement responses.

Perhaps selecting “3” reflects a somewhat cautious position about revealing family dynamics or possibly uncertainty as to bringing up future plans at home in this stage of growth. Either way, it might be a safer response that belies a student’s actual STEM knowledge capability. Such findings should be regarded as preliminary and in need of replication in future years. Since this is a trial item, it’s utility can be carefully evaluated and reviewed for continued inclusion or modification in subsequent Student Assessments.

Figure 3: Relationship of Talking with Family About Future Plans and Knowledge Test Gain

“I used to not like science until I came to DoD STARBASE. I would tell people to come here because it shows a different way of learning.”

STUDENT AT NOAH WEBSTER SCHOOL, ATTENDING STARBASE CONNECTICUT-WINDSOR LOCKS
Relation of Attitude Components to Knowledge Test Score

Pearson correlations between the seven Attitude Dimension scores and the Total Knowledge score were calculated. The seven Attitude Dimensions are moderately correlated with each other, as would be expected, yet are distinct enough to reflect clear aspects of student attitudes toward STEM, career, the military and DoD STARBASE. Correlations are presented between the Pre-Program Attitudes and both Pre-Program and Post-Program Knowledge scores, and between Post-Program Attitudes and Post-Program Knowledge scores in Table 40. Among the Pre-Program Attitudes, STEM Behavior & Motivation ($r = .18$, $p < .001$), Future Planning ($r = .13$, $p < .001$) and Science Confidence ($r = .09$, $p < .001$) are the strongest predictors of Post-Program Knowledge scores. These relationships are somewhat weaker than were found in 2017, particularly for Science Confidence. This suggests that general awareness of and motivation toward STEM topics among these students may be less well set than in previous years.

Table 40: Relationships of Pre-Program and Post-Program Attitudinal Dimension Scores with Pre-Program and Post-Program Knowledge Scores

<table>
<thead>
<tr>
<th>Attitude Dimension</th>
<th>Pre-Program Attitude with Pre-Program Knowledge</th>
<th>Pre-Program Attitude with Post-Program Knowledge</th>
<th>Post-Program Attitude with Post-Program Knowledge</th>
<th>Pre-Program Attitude with Pre- to Post-Program Knowledge Gap Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEM Concept Awareness</td>
<td>.04</td>
<td>.04</td>
<td>.08**</td>
<td>.01</td>
</tr>
<tr>
<td>Future Planning</td>
<td>.11**</td>
<td>.13**</td>
<td>.17**</td>
<td>.04</td>
</tr>
<tr>
<td>Science Confidence</td>
<td>.16**</td>
<td>.09**</td>
<td>.21**</td>
<td>-.04</td>
</tr>
<tr>
<td>STEM Behavior &amp; Motivation</td>
<td>.23**</td>
<td>.18**</td>
<td>.29**</td>
<td>.01</td>
</tr>
<tr>
<td>Military Setting Endorsement</td>
<td>.02</td>
<td>-.01</td>
<td>.06*</td>
<td>-.01</td>
</tr>
<tr>
<td>Teacher Support for STEM</td>
<td>.02</td>
<td>.01</td>
<td>.02</td>
<td>-.01</td>
</tr>
<tr>
<td>DoD STARBASE Program Evaluation</td>
<td>-.02</td>
<td>.07***</td>
<td>.12**</td>
<td>.09**</td>
</tr>
</tbody>
</table>

** $p < .01$; * $p < .05$

A new analysis conducted in 2017 looked at the correlation between pre-program Attitudes and the change in the Knowledge Score from pre- to post-program (i.e., the gap score). This analysis assesses whether students who come into the program with a higher level of STEM confidence and motivation also get a bigger boost from attending DoD STARBASE, or if those students who enter the program with less confidence and less motivation toward STEM topics benefit more from being exposed to the STEM curriculum at DoD STARBASE. It is not surprising that a student who shows high Science Confidence attitude, for example, also attains a high Knowledge Score at both the pre-test and post-test. The question is whether a confident student not only scores consistently high, but also achieves a greater gap score from pre-test to post-test than other students with lower initial STEM attitudes.
Most pre-test Attitude Dimensions did not predict students’ degree of Knowledge Score gain in 2017-2018. Nonetheless, students with more favorable DoD STARBASE Program evaluations at the pre-test not only scored higher than others on the knowledge post-test, but they also widened their lead by showing a greater increase in gap scores than other students ($r = .09$, $p = .001$). It may be that students with lower STEM-related attitude scores on the pre-test could benefit from helpful coaching to prevent them from falling further behind their more optimistic peers. These potential patterns seem appropriate to monitor in future years.

Additional correlations were conducted to examine the relationship between the pre-program Attitude Dimensions and specific post-program Knowledge Scores by curriculum area. Perhaps because of its high reliability and precision, the Total Attitude score tended to be a stronger predictor of the specific knowledge area scores than any of the individual Attitude Dimensions, with the exception of STEM Behavior & Motivation, which also was a strong predictor (see Table 41). Similar to 2016-17, Pre-Program STEM Behavior & Motivation was a significant predictor of Post-Program scores on Physics, Engineering, Chemistry, Mathematics, Technology and STEM Job Awareness ($r = .15; .14; .09; .07; .19$, respectively). Pre-Program Future Planning was a significant predictor of Chemistry, Engineering, Physics and STEM Job Awareness (all $r = .10$), whereas Science Confidence was a significant predictor of Post-Program Chemistry ($r = .12$) and Physics ($r = .07$), and STEM Job Awareness knowledge ($r = .11$). All results cited above are significant at $p < .05$ or greater.

**Table 41: Pre-Program Attitude Dimensions and Post-Program Knowledge Scores**

<table>
<thead>
<tr>
<th>Attitude Total</th>
<th>Knowledge Total</th>
<th>Chemistry</th>
<th>Engineering</th>
<th>Physics</th>
<th>Technology</th>
<th>Math</th>
<th>STEM Job Awareness</th>
</tr>
</thead>
<tbody>
<tr>
<td>.13**</td>
<td>.12**</td>
<td>.09**</td>
<td>.10**</td>
<td>.06*</td>
<td>.05*</td>
<td>.14**</td>
<td></td>
</tr>
<tr>
<td>STEM Concept Awareness</td>
<td>.04</td>
<td>.04</td>
<td>.03</td>
<td>.06*</td>
<td>.01</td>
<td>-.02</td>
<td>-.02</td>
</tr>
<tr>
<td>Future Planning</td>
<td>.13**</td>
<td>.10**</td>
<td>.10**</td>
<td>.10**</td>
<td>.05*</td>
<td>.05*</td>
<td>.10**</td>
</tr>
<tr>
<td>Science Confidence</td>
<td>.09**</td>
<td>.12**</td>
<td>.05</td>
<td>.07**</td>
<td>.02</td>
<td>-.01</td>
<td>.11**</td>
</tr>
<tr>
<td>STEM Behavior &amp; Motivation</td>
<td>.18**</td>
<td>.14**</td>
<td>.14**</td>
<td>.15**</td>
<td>.07**</td>
<td>.09**</td>
<td>.19**</td>
</tr>
<tr>
<td>Military Setting Endorsement</td>
<td>-.001</td>
<td>.01</td>
<td>-.01</td>
<td>-.01</td>
<td>.02</td>
<td>.003</td>
<td>.09**</td>
</tr>
<tr>
<td>Teacher Support for STEM</td>
<td>.01</td>
<td>-.02</td>
<td>-.003</td>
<td>.02</td>
<td>-.01</td>
<td>.06*</td>
<td>.06*</td>
</tr>
</tbody>
</table>

*$p < .01$; $^*p < .05$
High Versus Low Performers on Post-Program Knowledge Test

This analysis illustrates the differences between students who are high as opposed to low performers on the post-program Knowledge Test. First, the sum of correct answers to the 17 knowledge items for each student was converted to a percentage score by dividing by 17. Then, performance was measured using the post-program total assessment score sample mean of 66.75 and standard deviation of 19.47. High performance was a total score of 86.22 percent or higher (66.75 + 19.47). A total of 20 percent (n=325) of the sample was classified as high performers. Low performance was defined to be a total score of 47.28 or lower (66.75–19.47). A total of 21 percent (n=340) of the sample was classified as low performers.

Both the Low Performers and High Performers showed significant improvements after participating in the DoD STARBASE program. Similar to the past several years’ results, those students who scored low on the post-assessment also had scored low on the pre-assessment and did not improve as much. The Low Performers’ average gap score was a 9.29 percent increase from pre- to post-program, compared to the High Performers, who improved on average by 53.79 percent. The differences between the two groups in pre- and post-program total scores are statistically significant (Pre-test, F (1,663) = 233.94; Post-test, F (1,663) = 8,653.73; both results are significant at p < .0001).

Pre-program and post-program attitude scores also were converted to percentages by taking the average of the 31 items and dividing by 7 (the upper end of the rating scale). The pre- and post-program averages on the attitude surveys also were lower for low knowledge assessment performers. The low performing group had a significantly lower mean attitude rating both pre- and post-program (78.36 percent and 79.72 percent respectively, increase of +1.36 percent) as compared to the high performing group (82.84 percent and 86.53 percent respectively, increase of +3.69 percent), although the difference between groups in attitude shift was not significant (F (1,642) = 2.82, p = .09). Knowledge differences were greater than attitude differences between the High Performer and Low Performer groups. These data are shown in Figure 4.

Figure 4: High Versus Low Knowledge Test Performers on Knowledge Test Score Percentages and Attitude Survey Percentages
STEM job awareness: perceptions of STEM use in jobs

A new knowledge item in 2015, which also was used in subsequent years, asked students “Who uses STEM concepts in their job? (Select all that apply)” Twenty-five jobs were listed (Table 42), and the average number nominated pre-program as STEM-related in 2018 was 11.78 (SD = 5.51). The post-program number of jobs that were seen as STEM-related was 16.74 (SD = 6.25), which was a 42 percent increase and statistically significant (F (1,324) = 208.20, p < .0001). Thus, participants gained a greater awareness of the variety of occupations in which STEM concepts may play a part as a result of their exposure to the DoD STARBASE program.

DoD STARBASE participants were most likely to recognize that a Car Designer and Video Game Designer use STEM concepts in their jobs, and were least likely to make that connection for Housekeeper and Actor/Actress. Occupations that showed a big jump in participants’ recognition of their use of STEM concepts include Firefighter (+20.5 percent), Manager (+17.8 percent), Accountant (+17.7 percent), Nurse (+16.6 percent), and Military Personnel (+15.4 percent).

The statistically significant increase in participants’ recognitions of the use of science, technology, engineering and mathematics in a wide range of professions, including military service, provides further indication that the DoD STARBASE program is accomplishing its mission of heightening awareness by 5th Grade students of the relevance of STEM in occupations and careers.
Conclusion

The 2017-2018 DoD STARBASE program was successful in achieving its major goals as measured by the assessment of STEM-related student attitudes and knowledge before and after attending the program. It produced measurable changes in students’ positive attitudes toward science, technology, engineering and mathematics. Those positive attitudes are likely to be helpful in encouraging learning about STEM topics throughout the students’ academic careers.

In addition, the 2017-2018 DoD STARBASE program also yielded solid gains in students’ understanding of STEM concepts as shown by test performance. Students completed the program with an increase in STEM information and skills, which also should be of benefit in their continuing school learning about STEM topics. The increase in knowledge performance was particularly noticeable in girls, who, as evidence shows, are typically less well prepared in the STEM domain than boys when they first come to DoD STARBASE. Girls seem eager to recruit others to the DoD STARBASE program. Attention might be devoted to facilitating that in the future and monitoring its impact. Finally, the DoD STARBASE program appears to have supported the DoD sponsor’s community outreach objective by creating a favorable impression of the U.S. military and the people who work for it among many of the participating students.

“The things I learned at DoD STARBASE helped me better understand what I was missing out on, amazing subjects including math and science, [because] it helped me ‘unlock’ my brain to the possibilities in the world for the future.”

- STUDENT AT MONAHAN ELEMENTARY, ATTENDING TEXAS STARBASE-HOUSTON
Participating Teacher Assessment

Introduction

The DoD STARBASE Teacher Survey is an integral part of the annual evaluation to confirm the program's effectiveness, relevance, and support within the community. Teachers provide opinions on their own experience, as well as the program's effect on student behavior and attitudes, and they are in an excellent position to evaluate support within their school system and the community at large. Teachers can comment about the onsite operations of a DoD STARBASE academy that they attended, and experienced teachers give opinions on the enduring, long term impact that DoD STARBASE has had on themselves, their students, and the community environs. Through the years, the DoD STARBASE Teacher survey results and report have played an important role in monitoring, evaluating and verifying the program's positive influence in promoting STEM-based activities and careers among our nation's youth.

The Teacher Survey also assesses important personal characteristics such as their experience and confidence with teaching STEM-related subject matter. It assesses teacher opinions on a wide variety of topics related to the influence of the DoD STARBASE program including: appropriateness of the curriculum, immediate and enduring impact on students, educational materials and other resources (both within and beyond DoD STARBASE); and perceived support from school, parents, and community. The results suggest that the DoD STABBASE program is directly related to measurable changes in teacher perceptions over the years and has yielded large numbers of teacher advocates for exposing students to STEM-related topics in hopes that they will become more interested in the academic and professional opportunities related to Science, Technology, Engineering, and Mathematics.

In addition, the Teacher Survey analytics evaluate outcomes indicative of effective DoD STARBASE programs including:

- Progress toward specific academic requirements (e.g., STEM state standards)
- Improved personal characteristics of students (e.g., STEM confidence, academic interest, motivation, cooperation level)
- Future planning by students (e.g., awareness of, and desire to pursue career opportunities within STEM fields)
- Key stakeholder program support (e.g., principals and parents)

This year 62 out of 66 DoD STARBASE Academies were active in collecting responses from 2,630 teachers who completed the survey between August 2017 and June 2018. Every academy provided ratings from at least 12 teachers, with 44 of the academies providing a sample of 30 or more. One academy reached 100 teacher responses, and 3 other top volume academies each had more than 80 teacher respondents. Despite a few high-volume locations, the teacher responses in the database are well dispersed. No single academy represents more than 4 percent of the Teacher Survey database, with most academies representing 2 percent or less of the total database.

Each academy received a summary report of its teacher responses twice during the program year, once in February that included responses to date and again in July that included the entire academic year. The data provided feedback to help academies gauge program performance, identify improvements and set goals.

27 The newly installed STARBASE Indiana - Gary, STARBASE Idaho, STARBASE Edwards, and STARBASE Minnesota - Duluth, were not fully operational at the time of the teacher survey.
Academy Characteristics

The 62 active academies with teachers participating in the survey were affiliated with 5 Military Components across the United States. The National Guard hosted the majority of academies with 1,940 (74 percent) teachers responding to the survey from 47 academies. The Air Force sponsored 9 academies and included 400 (15 percent) completed teacher surveys.28

The academies were representative across regions with about 42 percent of the academies located in the South or Southeast and 31 percent located in the Midwest. The appendix provides the Military Component and Region for each academy location. Listed below are the number of participating academies and sample sizes of teacher surveys for each military component and region.

<table>
<thead>
<tr>
<th>MILITARY COMPONENT (N=2,609)</th>
<th>REGION (N=2,609)</th>
</tr>
</thead>
<tbody>
<tr>
<td>47 National Guard (N=1,940)</td>
<td>19 Midwest (N=823)</td>
</tr>
<tr>
<td>9 Air Force (N=400)</td>
<td>15 South (N=616)</td>
</tr>
<tr>
<td>4 Air Force Reserves (N=197)</td>
<td>12 Southeast (N=625)</td>
</tr>
<tr>
<td>1 Marine (N=46)</td>
<td>11 West (N=396)</td>
</tr>
<tr>
<td>1 Army (N=26)</td>
<td>5 East (N=149)</td>
</tr>
</tbody>
</table>

Teacher Demographics

For the 2017-18 academic year, 2,630 school personnel completed the online DoD Teacher Survey. Consistent with past results, in the 2017-18 cycle, the majority of teacher respondents were:

- Female (83 percent)
- Teaching the 5th grade (92 percent)
- Between the ages of 30 and 50 (60 percent)

Although there were respondents representing the full the range of years of teaching experience, the largest percentage (36.7 percent) of respondents indicated they have been teacher for over 15 years. Table 43 tabulates the current year’s data on the teacher characteristics.

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28 This year, teacher data was submitted from a new, Air Force sponsored, location: Texas - Goodfellow AFB.
The Teacher demographic data in the Table 43 suggests proportional representation of the participating teacher population (e.g., gender, age, years of experience) is fairly stable. Survey results show most of these participating teachers understand and embrace the mission of the DoD STARBASE program as evidenced by favorable shifts in opinions that reflect support for the mission of raising STEM awareness in both academic and professional settings for both students and teachers and in consistently high ratings and overall approval ratings of DoD STARBASE.

In total 1,072 teachers (41 percent) attended DoD STARBASE for the first time this year. Importantly, the survey results confirm that many first-year teachers (as well as teachers who have more experience) say they gain knowledge, motivation and insights about teaching STEM-related topics when they go to DoD STARBASE. These results reinforce an important aspect of the program: the consistently reported positive impact that participating in DoD STARBASE has on teachers, in addition to influence it has on participating students. The fact is, regardless of how a teacher becomes more aware of the STEM related educational and professional opportunities, they are likely to remain a stronger, more informed advocate of STEM pursuits for their students moving forward.

Since most teachers have years of experience before attending their first DoD STARBASE, the years of teaching experience will always be greater than years of teacher participation in DoD STARBASE. Issues like attrition and migration to other school systems play a role in the stable influx of new teachers, most of whom will be positively influenced by the DoD STARBASE experience.

Figure 1 presents a graph showing the number of teachers responding to the survey over the past six years. Past reports have shown only five years of results; this year it was determined that dropping 2013 would suggest a strong growth trend, while leaving the 2013 results in represents the program’s history more accurately: showing a sharp reduction in 2014 participation followed by sustained re-growth since then.

### Table 43: Teacher Characteristics

<table>
<thead>
<tr>
<th>Years Taught</th>
<th>Experience with DoD STARBASE</th>
<th>Grade Taught</th>
<th>Age Range</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7%</td>
<td>First year</td>
<td>3%</td>
<td>21%</td>
<td>83% Female</td>
</tr>
<tr>
<td>15%</td>
<td>2-4 Years</td>
<td>4th Grade</td>
<td>Under 30 years</td>
<td></td>
</tr>
<tr>
<td>15%</td>
<td>5-7 Years</td>
<td>5th Grade</td>
<td>31-40 years</td>
<td></td>
</tr>
<tr>
<td>9%</td>
<td>8-10 Years</td>
<td>5th Grade</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>17%</td>
<td>11-15 Years</td>
<td>Other response</td>
<td>29%</td>
<td></td>
</tr>
<tr>
<td>37%</td>
<td>Over 15 Years</td>
<td>(e.g., special class, assistant, all grades, administrator)</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4%</td>
<td></td>
</tr>
</tbody>
</table>

Table 43: Teacher Characteristics

The Teacher demographic data in the Table 43 suggests proportional representation of the participating teacher population (e.g., gender, age, years of experience) is fairly stable. Survey results show most of these participating teachers understand and embrace the mission of the DoD STARBASE program as evidenced by favorable shifts in opinions that reflect support for the mission of raising STEM awareness in both academic and professional settings for both students and teachers and in consistently high ratings and overall approval ratings of DoD STARBASE.
Figure 5 shows the range of experience the teachers have with DoD STARBASE and the range of experience the schools have with the program. This year, as in 2017, the “years of school participation” item had an option for “I don’t know” which was selected by 27 percent of the respondents. Please note that the “I don’t know” response option was not used in calculating response percentages so the distribution of answers from the 73 percent of teachers who did know how long their school has participated is not diluted. For the same reason, the percent of “I don’t know” responses to this item does not appear in the pie chart graphic.

A little more than half of the schools (52 percent) have participated in the program for less than five years. The other portion (48 percent) of the schools have had 5 or more years with DoD STARBASE. This includes 20 percent of teachers indicating their school has participated for 10 years or more in the DoD STARBASE program. In contrast less than 1 percent of the teachers report having participated for 15 years or more in the program, while 41 percent indicated it was their first year participating in a DoD STARBASE program.

This year has more representation in the “first-year” and “2-4 years” experience categories (78 percent total compared to the 51 percent obtained last year). Overall, the data continues to show the DoD STARBASE program reaches a substantial number of first-time participants each year, and the Teacher Survey is capturing perspectives from teachers who are new as well as those who are experienced participants in the DoD STARBASE program. With a stable participation rate, new academies coming on line, and years of evidence showing a positive impact in stimulating STEM interest among America’s youth, the DoD STARBASE program seems to be achieving its stated goals quite effectively.
CONFIDENCE TEACHING STEM

To evaluate familiarity with STEM topics, teachers were asked whether their college major and/or minor were in a STEM-related discipline. Eighty-three percent (N=2,177) of the teachers reported that their college major and/or minor was not in a STEM-related discipline. Of the remaining responses, 9 percent show their major was in a STEM-related discipline, and 8 percent reported that they minored in a STEM-related discipline.

Teachers also provided their level of comfort with teaching STEM-related topics in the classroom.

Overall, teachers are confident teaching STEM-related topics to their students with most reporting being Fairly (34 percent), Quite (35 percent) or Very (16 percent) confident (see Figure 7). Only 37 of the respondents revealed that they are not confident teaching STEM-related topics, representing just 1.4 percent of all respondents.
Teachers who have a degree in a STEM-related discipline report have more confidence in teaching STEM-related topics to their students. Among the 9 percent (N=237) of all teachers responding who majored in a STEM-related discipline, 84 percent indicated that they are Very or Quite Confident teaching STEM-related subjects. For the 8 percent (N=220) of all respondents who minored in a STEM-related discipline the percentage indicating that they are Very or Quite Confident teaching STEM-related subjects was somewhat lower, but strong at 78 percent. Lastly, only 45 percent of the remaining 2,177 respondents who did not major or minor in a STEM-related discipline reported being Very or Quite Confident in teaching STEM-related topics (Figure 8).

**Figure 8: Confidence in Teaching STEM Concepts Based on College Major/Minor**

- **No, major and minor were not in STEM-related disciplines**
  - Not at all Confident: 53.4%
  - Somewhat/Fairly Confident: 44.9%
  - Very/Quite Confident: 1.4%

- **Yes, minored in a STEM-related discipline (N=216)**
  - Not at all Confident: 78.7%
  - Somewhat/Fairly Confident: 21.3%
  - Very/Quite Confident: 15.6%

- **Yes, majored in a STEM-related discipline (N=237)**
  - Not at all Confident: 84.4%
  - Somewhat/Fairly Confident: 15.6%
  - Very/Quite Confident: 1.1%

“**I thoroughly enjoyed talking with the kids at DoD STARBASE and providing them with insight into aviation operations and STEM related fields. I feel children benefit from open discussions with aviation enthusiasts. The information they receive opens their eyes to the possibilities and opportunities that lay ahead. The hands-on learning and application of STEM subjects gives students a better understanding of the world around them and broadens their career horizons.**”

- MSGT EVAN BRITTON,
  STARBASE NEW MEXICO
**Teacher Attitudinal Ratings**

Teachers rated 46 attitudinal items on a 7-point Likert scale from Disagree (1) to Agree (7) based on their experience with the DoD STARBASE program. Ten items reference changes in student behavior after DoD STARBASE, therefore these 10 items were not posed to teachers in their first year of DoD STARBASE participation. The items were aggregated into an Overall Index which covered topics including teacher opinions about student’s enjoying the STEM program content, displaying confidence and motivation in classroom settings, and planning for future goals and careers. Overall, favorability was in the range established by the attitude score for the previous years (Table 44). Although the content has been modified over the years, the underlying concepts and themes remain consistent from year to year.

<table>
<thead>
<tr>
<th>Table 44: Mean Overall Attitudinal Index Scores for the Teacher Survey (2014 - 18)29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Index</td>
</tr>
<tr>
<td>Summative Mean Ratings</td>
</tr>
</tbody>
</table>

The Teacher Survey content aligns with the stated DoD STARBASE program goals by incorporating measurement elements of the program’s impact on both teachers and students during and after attendance. The following table (Table 45) provides the concepts and definitions for each area measured. Additional details for each of the measurement areas are included in the appendix.

Student/Teacher Engagement is a composite of 32 items based on teachers’ self-report of their attitudes and their perceptions of students’ attitudes during the DoD STARBASE program. Engagement attitudes were grouped according to topic area (e.g., STEM Concepts, Program Support) to illustrate the aggregate ratings of most favorable to least favorable measurement area. As reflected by the Student/Teacher Engagement composite, teachers responded favorably across all measurement topics; Table 45 presents these composite scales presented in rank order showing most composite mean scores above 6.00. Mean composite scores for Future Planning and Military and Career were strong, but under 6.00 (5.88 and 5.80, respectively).

The analyses also examined the outcomes of DoD STARBASE on student STEM and academic motivation beyond the immediate effects of attendance. The Post-Program Impact scale uses responses to 10 items completed by those teachers who have more than one year of experience with the DoD STARBASE program (N = 1,558). These teachers are in a good position to observe how much their students continued to exhibit STEM relevant pursuits after their DoD STARBASE experience. Items included a broad range of post-program measures including students’ interest in STEM, their awareness of career options, classroom attendance, and participation in STEM-related activities. Some of these differences will be addressed in more detail in upcoming sections of this report.

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29 The calculations included in this table are the total mean responses for all attitudinal items.
Table 45: Teacher Survey Measurement Areas

<table>
<thead>
<tr>
<th>Measurement Area</th>
<th>Definition</th>
<th>Number of Items*</th>
<th>Cronbach’s Alpha**</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student/Teacher Engagement</td>
<td>Engagement shown while attending DoD STARBASE</td>
<td>32</td>
<td>.959</td>
<td>6.16</td>
<td>0.674</td>
</tr>
<tr>
<td>STEM Concepts</td>
<td>Student interest in and understanding of STEM concepts</td>
<td>6</td>
<td>.858</td>
<td>6.38</td>
<td>0.663</td>
</tr>
<tr>
<td>Program Support</td>
<td>Support and resources provided to the teachers</td>
<td>7</td>
<td>.716</td>
<td>6.36</td>
<td>0.652</td>
</tr>
<tr>
<td>Confidence</td>
<td>Students’ confidence with abilities and capabilities</td>
<td>3</td>
<td>.842</td>
<td>6.17</td>
<td>0.813</td>
</tr>
<tr>
<td>Behavioral-Motivational</td>
<td>Effort shown by teachers in reinforcing positive behaviors</td>
<td>5</td>
<td>.752</td>
<td>6.08</td>
<td>0.788</td>
</tr>
<tr>
<td>Teamwork</td>
<td>Students working with and supporting each other</td>
<td>3</td>
<td>.908</td>
<td>6.04</td>
<td>0.957</td>
</tr>
<tr>
<td>Future Planning</td>
<td>Students seeing future possibilities and opportunities</td>
<td>4</td>
<td>.913</td>
<td>5.88</td>
<td>0.941</td>
</tr>
<tr>
<td>Military and Career</td>
<td>Teacher’s personal opinion on Military personnel and career options and their perceptions of student opinions on same</td>
<td>5</td>
<td>.770</td>
<td>5.80</td>
<td>0.871</td>
</tr>
<tr>
<td>Post-Program Impact</td>
<td>Lasting impact of DoD STARBASE after the program ends</td>
<td>10</td>
<td>.893</td>
<td>6.06</td>
<td>0.751</td>
</tr>
</tbody>
</table>

*Thirty-three of the 36 attitudinal items responded to by the entire sample of teachers were spread across the 7 rationally derived engagement sub-categories. Thirty-two of these items formed the overall Student/Teacher Engagement Composite.

**Indicates measurement reliability in terms of internal consistency, or similarity, among contributing items. Values approaching or exceeding .90 reflect higher consistency; values approaching or below .70 suggest relatively more diverse subject content among items.
DoD STARBASE Impact on the School System

The DoD STARBASE program directly influences students and teachers through personal interactions, yet also impacts the school system overall. As part of the Teacher Survey, teachers shared their knowledge of specific institutional practices based on their participation in the program. Table 46 provides the trends in favorable responses to five items dating back to 2014. The trend has shown generally more favorable responses since 2014 and some very strong sustained high favorability rates.

For instance, an examination of Table 46 shows the item assessing whether schools have formal communications to raise awareness about DoD STARBASE hit a new high mark in 2018 at 65.7 percent (compared to 42.8 percent in 2014). Also, a new high favorability rate of 91.5 percent was achieved for an item asking teachers who have received DoD STARBASE materials if they plan to use those DoD STARBASE materials in their class room. A follow-up analysis showed the response rate of teachers who say they did NOT receive any materials from DoD STARBASE to take to their home class is on the decline: 16 percent of teachers said they didn’t receive materials in 2014; in 2018 this statistic is much lower at 5.5 percent.

Table 46: DoD STARBASE’s Impact on the School System

<table>
<thead>
<tr>
<th>Item</th>
<th>Positive (Yes) Responses</th>
<th>Positive (Yes) Responses</th>
<th>Positive (Yes) Responses</th>
<th>Positive (Yes) Responses</th>
<th>Positive (Yes) Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Item</td>
<td>2014</td>
<td>2015</td>
<td>2016</td>
<td>2017</td>
<td>2018</td>
</tr>
<tr>
<td>Is there formal communication from your school that raises community awareness of the DoD STARBASE program (e.g., letters to parents, overview at parent open house meetings, etc.)?</td>
<td>42.8%</td>
<td>62.8%</td>
<td>66.1%</td>
<td>65.6%</td>
<td>67.5%</td>
</tr>
<tr>
<td>Will you recommend DoD STARBASE to other teachers, principals, or school educators/administrators?</td>
<td>90.5%</td>
<td>99.4%</td>
<td>99.5%</td>
<td>99.6%</td>
<td>99.1%</td>
</tr>
<tr>
<td>In your view, does the DoD STARBASE curriculum help you reach your state education standards?</td>
<td>99.6%</td>
<td>94.2%</td>
<td>94.8%</td>
<td>98.0%</td>
<td>87.0%</td>
</tr>
<tr>
<td>Do you or will you use DoD STARBASE materials/applications in your own classroom?</td>
<td>58.1%</td>
<td>85.5%</td>
<td>86.1%</td>
<td>90.9%</td>
<td>91.5%</td>
</tr>
<tr>
<td>Do you or will you use DoD STARBASE take home activities beyond your classroom?</td>
<td>36.9%</td>
<td>65.8%</td>
<td>67.4%</td>
<td>71.3%</td>
<td>70.8%</td>
</tr>
</tbody>
</table>
In an example of sustained high favorability over time, the item on recommending DoD STARBASE to other school officials returned a 99.1 percent result, very close to last year’s result. Thus, this item shows both sustained improvement over earlier years and a historic trend that currently shows a tendency toward highly favorable, highly stable responses from the teacher population.

Most teachers at every academy location have said they did receive materials to use in their classrooms, and many plan to use them. However, there were some academies where 10 percent or more of teachers state they did not receive any materials. These academies included: Alpena, Michigan; Kansas City, Kansas; Cheyenne, Wyoming; Tucson, Arizona; Wright-Patt, Ohio; Fort Harrison, Montana; Savannah, Georgia; Austin, Texas; and Charleston, West Virginia. It should be noted that DoD STARBASE is a dynamic program that is conducted on site with the students and therefore DoD STARBASE locations are NOT required to provide additional “take-home” materials.

Also, there may be a burgeoning issue regarding the results for the item assessing whether or not the DoD STARBASE curriculum helps teachers meet their state education standards that calls for further examination. In the past, this item has seen returns in the high 90’s percentile. This year, there was a downward shift with only 87 percent stating the curriculum directly helps teachers meet state standards. It is very important to note that most of the responses that moved away from the affirmative “Yes” response moved to the next statement: “No, the curriculum only indirectly helps reach state standards.” It should be noted that this item has two more response options which are even less favorable regarding the fit of the DoD STARBASE curriculum to state standards. Importantly, the response rate to these two answers, which are most critical of the curriculum, did not increase and are extremely low in frequency. Only 15 respondents out of 2,617 chose 1 of the 2 least favorable answers to the item assessing if the “DoD STARBASE curriculum helps me meet state education requirements.”

Therefore, while it is concerning to see more teachers saying the curriculum is currently not fitting their state standards as well as before, it is possible that changes to some state standards are contributing to the drop-in favorability. If this is the case, there should be an opportunity to examine and re-evaluate recent changes in state standards. Perhaps changes are occurring which are, in turn, creating new directions for curriculum development to ensure DoD STARBASE continues to get great results about the program’s curriculum and relevance.

Follow up examination of the data shows rates of response for “curriculum helps only indirectly” exceeded 20 percent for academies in Oklahoma City, Oklahoma; Cheyenne, Wyoming; Wright-Patt, Ohio; San Angelo, Texas; Houston, Texas; Austin, Texas; Savannah, Georgia; Waterbury, Connecticut; Winchester, Virginia; and Hill AFB, Utah.

Finally, it should be noted that the response rates to the two most unfavorable responses did not increase and are extremely low in frequency, only 15 respondents out of 2,617 chose 1 of the 2 least favorable answers to the item assessing if the “DoD STARBASE curriculum helps me meet state education requirements.”
Impact of School and Teacher Support on Teacher Attitudinal Ratings

Program support includes support and advocacy of DoD STARBASE by teachers themselves as well as the resources and support provided to the teachers in the school environment. A school’s plan to continue participation in the DoD STARBASE program next year (mean=6.90) indicates that participating schools perceive value from having students attend the program. Additionally, there is evidence of continued support from the teachers who are looking forward to future participation (6.78), as well as from parents who are delighted their children are participating (6.39), and principals who are strong advocates for the program in general (6.08) (Table 47).

Teachers indicated that they would like to bring more supplemental resources from the DoD STARBASE program back to their classrooms (6.39), and they plan to incorporate some of the teaching techniques they observed into their classroom activities (6.26). There was a 91.5 percent agreement rate regarding intention to use materials from DoD STARBASE in the classroom, shown in Table 46 above, which further reinforces teacher requests for more classroom STEM materials. As in the past, some teachers prefer DoD supplemental resources over other similar resources (5.81).

### Table 47: Program Support Ranked from Most to Least Favorable

<table>
<thead>
<tr>
<th>Support Statement</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>My school plans to participate in the DoD STARBASE program again next year.</td>
<td>6.90</td>
<td>0.544</td>
</tr>
<tr>
<td>I look forward to bringing future classes to the DoD STARBASE program.</td>
<td>6.78</td>
<td>0.683</td>
</tr>
<tr>
<td>I would like more DoD STARBASE supplemental resources to take back to my classroom.</td>
<td>6.39</td>
<td>1.075</td>
</tr>
<tr>
<td>Parents are delighted that their children are participating in DoD STARBASE.</td>
<td>6.39</td>
<td>0.973</td>
</tr>
<tr>
<td>I plan to incorporate DoD STARBASE teaching techniques into my daily classroom activities.</td>
<td>6.26</td>
<td>1.035</td>
</tr>
<tr>
<td>My principal is a strong advocate of DoD STARBASE.</td>
<td>6.08</td>
<td>1.309</td>
</tr>
<tr>
<td>I prefer the supplemental resources DoD STARBASE provides to teachers over other similar resources.</td>
<td>5.81</td>
<td>1.293</td>
</tr>
</tbody>
</table>

“DoD STARBASE is my favorite week of the school year; student’s attendance increases, students are excited about what they are learning, and they are sad when the week ends.”

- EDUCATOR AT ANDERSON ELEMENTARY, ATTENDING STARBASE FT. FISHER
Analysis of Overall Index

The Overall Index is an aggregate scale based on the mean or average of the attitudinal items. The Overall Index score was compared based on responses to items ascertaining the level of support provided to the teachers. In all instances, those teachers who received support from the school and resource materials responded with more favorable attitudes toward the DoD STARBASE program as a whole compared to those teachers with little or no perceived support. Figure 9 shows the percent of responses to each of the support items, and the Overall Index mean according to response category (e.g., yes, or no). See Figure 9 for graphic presentation of the highlights which include specific outcome comparisons based on the following analyses:

- Teachers who use or plan to use DoD STARBASE resource material and take-home activities have more favorable attitudes as measured by the Overall Index (6.19 and 6.27, respectively) compared to those who do not utilize these resources (5.40 and 5.70, respectively).
- Those teachers reporting that the DoD STARBASE curriculum directly helped them reach state education standards have more favorable overall attitudes (6.21) compared to those reporting only an indirect relationship (5.65).
- Schools with formal communication processes in place had higher teacher ratings (6.21) on the Overall Index than those with no formal communication (6.02) processes in place.
- Teachers who would recommend the DoD STARBASE program responded with higher overall ratings (6.15) as compared to those who would not recommend the program (4.43). Note, the number of teachers who would not recommend the program was quite small (N=32); none-the-less, the result shows how strong overall approval of the program motivates teachers to share information about the program with other adults in school administration.

![Figure 9: Overall Attitude Ratings by DoD STARBASE Impact Items](image-url)
Military Experience and Career Opportunities

The majority of teachers (72.8 percent) involved in the DoD STARBASE program this year have had some type of exposure to a military base either for prior DoD STARBASE programs (15.5 percent), non-related programs (36.3 percent), or for a combination of both STARBASE and non-STARBSE reasons (18.6 percent). Just over a quarter of the teachers (26.3 percent) reported that this is their first experience with a military base and the DoD STARBASE program (Table 48). Just 3.2 percent of respondents chose to describe whether or not they had been to a military base for some other specific reason; the majority of whom HAVE been to a military base for a variety of reasons.

Table 48: Experience with a Military Base

<table>
<thead>
<tr>
<th>Response</th>
<th>2014 (N=1,076)</th>
<th>2015 (N=1,668)</th>
<th>2016 (N=2,296)</th>
<th>2017 (N=2,639)</th>
<th>2018 (N=2,630)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never visited a military base before the current DoD STARBASE Program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>271</td>
<td>424</td>
<td>589</td>
<td>633</td>
<td>693</td>
</tr>
<tr>
<td></td>
<td>25.2%</td>
<td>25.4%</td>
<td>25.7%</td>
<td>23.9%</td>
<td>26.3%</td>
</tr>
<tr>
<td>Yes, for prior DoD STARBASE programs only</td>
<td>163</td>
<td>232</td>
<td>383</td>
<td>399</td>
<td>408</td>
</tr>
<tr>
<td></td>
<td>15.1%</td>
<td>13.9%</td>
<td>14.3%</td>
<td>15.1%</td>
<td>15.5%</td>
</tr>
<tr>
<td>Yes, for activities not related to DoD STARBASE</td>
<td>356</td>
<td>590</td>
<td>827</td>
<td>929</td>
<td>956</td>
</tr>
<tr>
<td></td>
<td>33.1%</td>
<td>35.4%</td>
<td>36.0%</td>
<td>35.2%</td>
<td>36.3%</td>
</tr>
<tr>
<td>Yes, for DoD STARBASE and non-DoD STARBASE activities</td>
<td>231</td>
<td>330</td>
<td>442</td>
<td>558</td>
<td>490</td>
</tr>
<tr>
<td></td>
<td>21.5%</td>
<td>19.8%</td>
<td>19.3%</td>
<td>21.2%</td>
<td>18.6%</td>
</tr>
<tr>
<td>Other</td>
<td>55</td>
<td>92</td>
<td>110</td>
<td>118</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>5.15</td>
<td>5.5%</td>
<td>4.8%</td>
<td>4.5%</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

For teachers, attending DoD STARBASE academies correlates with some exciting and meaningful changes in perspective. For instance, 89 percent (N=2,346) of the teachers reported that they are more aware of career opportunities (both uniformed and non-uniformed civilian) within the Department of Defense because of their participation in the DoD STARBASE program. Teachers also indicated how likely they were to recommend DoD or the military as a career option both prior to and after attending a DoD STARBASE program. The results show an 82 percent increase (from 38 percent to 69 percent) in teachers who say they are Very Likely (37 percent) or Extremely Likely (32 percent) to recommend the military or DoD civilian careers after the program as compared to a total of only 38 percent before the program (22 percent Very Likely and 16 percent Extremely Likely). Figure 10 displays the change in favorability based on percentage of responses within each of the response categories.
The next section of this report examines results from items that were only posed to teachers who have at least one year of experience with DoD STARBASE (N = 1,558). These items asked the experienced teachers to rate the degree of beneficial post-program impacts on students they noticed after students have a DoD STARBASE experience. These post-impact attitudes along with all survey measurement areas were compared based on whether or not teachers reported increased awareness of DoD career opportunities. Experienced teachers who confirm they gained awareness of STEM-related occupations through participating in the program tended to endorse the following items/opinions with higher ratings (by at least 0.8 of a point on a 7-point Likert scale) than those teachers who feel their awareness of STEM-related occupations was not broadened by their participation in DoD STARBASE. The most meaningful differences in favorable response occurred for the following inquiries on student behaviors. These items are listed in order of magnitude of difference between the higher favorability rating from the group that DID gain knowledge of STEM careers at STARBASE vs. those who said attending DoD STARBASE didn’t expand their knowledge of STEM-related careers in both military and non-military settings.

- Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions.
- After DoD STARBASE, students have better school attendance.
- Students that have attended DoD STARBASE seem to perform better on standardized state assessments.
- After DoD STARBASE, students are more interested in using computers for class-related learning activities.
- After DoD STARBASE attendance, there is increased participation in the Science Fair and other STEM-related challenge programs (e.g., FIRST LEGO League, Odyssey of the Mind, Team America Rocket Competition, etc.).
- After the DoD STARBASE program, the students ask more questions about technology.
The average difference for the “Post-Program Impact” composite scale is presented in Figure 11. Please note that the Post-Program Impact composite group size is N=1,558, while the other composite scores presented in Figure 11 are based on the full sample of 2,630.

**Figure 11: Teacher Perceptions of Student Behavior Based on Teachers Becoming More Aware of Department of Defense Career Opportunities After Attending DoD STARBASE**
Facilitating STEM Awareness in Students

Teacher attitudes toward students’ STEM awareness was measured by six items, of which four items focused on students’ level of interest in learning about each of the four STEM areas, and two items assessed whether there was an improvement in their appreciation and understanding of science and math (Table 49).

Table 49: STEM Awareness Historical Comparisons

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>DoD STARBASE has helped to improve the students' understanding of science.</td>
<td>6.54</td>
<td>6.64</td>
<td>6.69</td>
<td>6.72</td>
<td>6.72</td>
</tr>
<tr>
<td>More interested in learning about technology.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More interested in learning about science.</td>
<td>6.53</td>
<td>6.46</td>
<td>6.54</td>
<td>6.54</td>
<td>6.48</td>
</tr>
<tr>
<td>DoD STARBASE has helped to improve students’ appreciation of how math can be applied to a variety of situations.</td>
<td>6.26</td>
<td>6.49</td>
<td>6.49</td>
<td>6.48</td>
<td>6.45</td>
</tr>
<tr>
<td>More interested in learning about engineering.*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>More interested in learning about math.</td>
<td>5.79</td>
<td>5.93</td>
<td>5.97</td>
<td>5.97</td>
<td>5.92</td>
</tr>
</tbody>
</table>

* New in 2015

Similar to previous years, concepts related to science were rated slightly higher than math. Specifically, teachers rated students were more interested in science (6.48) compared to math (5.92) and had improved understanding of science (6.72) compared to appreciation of how math can be applied (6.45).

As in the past, only the item assessing student interest in learning about math has an average favorability rating under 6.00. The current trend is toward more interest by students in learning about technology followed by science, engineering, and math, in that order.

Examining Table 49 closely reveals that the mean favorability ratings on four out of five of the items are slightly lower than in 2017; although they are still very high and the basic trend is not alarming, this could be the start of a more significant trend. Re-evaluating these item results next year to see if a trend is increasing, stable, or correcting is advised.
Developing Continued STEM Interest

Teachers provided their opinion on the best way to continue developing their students’ interest in STEM-related activities. Seventy-five percent of respondents indicated that the best way to continue interest is to promote an existing program (33 percent) or a new program (42 percent) in the school system (Table 50). The least likely ways to increase awareness in the teachers’ view included promoting a new program at the national, state, or community level (17 percent) or through an existing community-based program (9 percent).

Historically, teacher opinions regarding the BEST way to develop students’ continuing interest in STEM-related activities have more strongly endorsed promoting new and existing STEM programs in schools, with less endorsement of promoting new and existing programs supported by national, state or local entities. The DoD STARBASE program provides a unique opportunity to reach students and teachers by utilizing the school system to access DoD/Military personnel and civilian instructors who have specialized training in STEM-related topics. By maintaining a network of relationships with teachers and the school systems, DoD STARBASE administrators ensure the DoD STARBASE program stays well connected within local school systems.

Table 50: Developing Interest in STEM-Related Activities

<table>
<thead>
<tr>
<th>Best way to develop continuing interest in STEM-related activities</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promoting a new program in the school system</td>
<td>1,108</td>
<td>42%</td>
</tr>
<tr>
<td>An existing school-based program</td>
<td>854</td>
<td>33%</td>
</tr>
<tr>
<td>Promoting a new program at the national, state, or community level</td>
<td>441</td>
<td>17%</td>
</tr>
<tr>
<td>An existing community-based program</td>
<td>227</td>
<td>9%</td>
</tr>
</tbody>
</table>

Available STEM Programs

Teachers provided information regarding community programs, extra-curricular activities, and available resources and/or equipment within the school in order to promote student access and interest in STEM concepts (Table 51). While over 25 percent of teachers report that there are “many” (9 percent) or “several” (18 percent) relevant STEM-awareness programs available to their students within their school and/or community, a similar portion (24 percent) said there were no programs available. “Only a couple of relevant programs” was the most common answer (50 percent).

Table 51: STEM-Related School or Community Resources and Extra-Curricular Programs/Activities

<table>
<thead>
<tr>
<th>Other resources in the school or community to further develop my students’ STEM awareness beyond DoD STARBASE include...</th>
<th>Does your community have extra-curricular programs and/or activities for stimulating STEM interest aimed at middle school aged students?</th>
</tr>
</thead>
<tbody>
<tr>
<td>9% Many relevant STEM awareness programs</td>
<td>43% Yes</td>
</tr>
<tr>
<td>18% Several relevant programs</td>
<td>14% No</td>
</tr>
<tr>
<td>50% Only a couple of relevant programs</td>
<td>44% Not sure</td>
</tr>
<tr>
<td>24% No other relevant programs</td>
<td></td>
</tr>
</tbody>
</table>
Data trends regarding STEM-related School or Community Resources and Extra-curricular Programs/Activities include:

- A slight decrease in the percentage of teachers picking the most favorable response of “many” available STEM-relevant programs; however, those lost responses seem to be moving into the second-best response: that there are “several” STEM related programs available in the community.
- Forty-three percent of teachers confirmed the existence of programs in the community for stimulating STEM interest aimed at middle school aged students (up from 38 percent in 2017).

**Additional Stem Resources**

Teachers also identified specific STEM awareness programs, activities, resources and equipment available to students within the school system and the community at large. Thirty-six percent of the teachers indicate that organized STEM awareness programs, activities or resources for their students after attending the DoD STARBASE program either are not available (12 percent) or none are planned (23 percent) (Figure 12). In addition:

- Four hundred and ten teachers wrote in other STEM programs or activities.
- One hundred and seven teachers wrote in comments about other resources or equipment they have available.
- Sixty-two percent of the teachers (N=1,619) were able to identify at least one organized activity, program or other resource for their students after DoD STARBASE has ended (e.g., Science Fair, Robotics challenge).
- In a repeat of last year’s results, 99 percent of teachers report there are resources and/or equipment available in school for students to use (e.g., Math activities, Specialty labs).
- As in 2017, 88 percent of teachers confirmed they have a PC in the classroom for student activities.

This information could be relevant when considering media platforms in the planning and development of new DoD STARBASE curriculum, activities, and materials for teachers to use in their own classrooms.
Referring students to additional STEM-related programs or resources after DoD STARBASE is dependent upon availability and appropriateness to the student population. Therefore, it is important that teachers and educators have post-DoD STARBASE programs available to continue to engage the students after the program has ended. Ninety-seven percent of the teachers plan to always (46 percent), often (35 percent), or sometimes (16 percent) refer students to additional STEM-related programs or resources after the DoD STARBASE program has ended (Table 52).

The high percentage of teachers who plan to refer students to additional STEM-related programs suggests that, whether or not they formed their opinion as a direct result of DoD STARBASE, nearly all the teachers who have attended a DoD STARBASE academy understand the importance of fostering continued STEM-related interest in their students, even beyond the classroom.

**Table 52: Percent of Teachers Likely to Refer Students to STEM-Related Programs or Resources**

<table>
<thead>
<tr>
<th>I plan to refer students to additional STEM-related programs or resources after DoD STARBASE.</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>1180</td>
<td>46</td>
<td>46</td>
</tr>
<tr>
<td>Often</td>
<td>906</td>
<td>35.3</td>
<td>81.2</td>
</tr>
<tr>
<td>Sometimes</td>
<td>414</td>
<td>16.1</td>
<td>97.4</td>
</tr>
<tr>
<td>Once or twice</td>
<td>55</td>
<td>2.1</td>
<td>99.5</td>
</tr>
<tr>
<td>Not at all</td>
<td>13</td>
<td>0.5</td>
<td>100</td>
</tr>
</tbody>
</table>

**Drivers of Selected Target Ratings**

Stepwise multiple regression analyses were performed to determine the important drivers of key teacher attitudes and ratings about DoD STARBASE. The key teacher ratings selected this year focus on broad program impact and on students’ STEM and career engagement attitudes. The first regression analysis evaluated the post-program impact based on student and teacher engagement attitudes. Post-program impact was a composite scale calculated using 10 items completed by teachers with more than 1 year of experience participating in the DoD STARBASE program. This composite scale was regressed using the core items administered to all teachers evaluating their attitudes in relation to the 32 engagement survey items.

The drivers for each regression are listed in order of magnitude and oftentimes provide a comprehensive listing for identifying actions that most influence program effectiveness. The drivers listed for the Post-program Impact aggregate scale explain approximately 54 percent of the variance, or variability, across teachers in their perceptions of DoD STARBASE impact (as indicated by an R2 value of .539). That is, these items predict individual teacher opinion about the program’s impact on students with a high degree of efficiency. Thus, they provide a condensed model from which to tell how teachers feel about the program. The more drivers that are answered favorably or affirmatively, the more likely it is that a teacher holds a strongly positive viewpoint of the program’s impact.

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30 The appendix provides a definition of multiple regression and other statistical techniques used in this report.
The results are different from the driver model of Post-program Impact derived in 2017, with only 25 percent overlap of the contributing teacher attitude items. This time, teacher perceptions of students’ focus on their future goals, comfort with military personnel, and interest in technology, teacher preference for DoD STARBASE supplemental resources, and better school attendance were key factors in positive post-program attitudes. Teachers’ motivation to become more skilled in STEM instruction, parents’ delight in DoD STARBASE participation, and teacher perceptions of student ability to work in groups are also important factors in determining positive opinions of DoD STARBASE impact.

**Drivers of Post-Program Impact** *(R² = .539; p<.05)*

- While attending DoD STARBASE, the students appear more ready to set future and career goals.
- I prefer the supplemental resources DoD STARBASE provides to teachers over other similar resources.
- While attending DoD STARBASE, the students appear more comfortable with military personnel.
- During DoD STARBASE, students have better school attendance.
- While attending DoD STARBASE, the students appear more interested in learning about technology.
- The DoD STARBASE experience has influenced me to become skilled in STEM instruction.
- Parents are delighted that their children are participating in DoD STARBASE.
- While attending DoD STARBASE, the students appear better at working in groups.
- While attending DoD STARBASE, the students appear to have more questions about DoD and other non-military career opportunities.

Table 53 provides a summary of the regression analyses for key target ratings based on all attitudinal items within the Teacher Survey. The predictive models selected for analysis this year once again focus on students’ attitudes about future career opportunities and their understanding of how STEM-related skills and abilities link to various career paths. The top few drivers listed in the summary of each target rating predictor model below tend largely to be the same ones as in previous years. This helps to solidify a core set of teacher perceptions of student behaviors and their own attitudes that directly implicate the influence DoD STARBASE exerts on forming student aspirations for their future STEM-related educational pursuits and possible career directions.

The DoD STARBASE program helps students understand their potential. Specifically, the regression analyses identified several areas that had the most impact across many of the target attitudes including, but not limited to, the following:

- Helping students understand better how STEM skills/abilities fit job requirements for certain career fields.
- Helping students understand better that developing their current skills/abilities is necessary to have good future career choices.
- Have more questions about DoD and other non-military career opportunities.
- More comfortable with military personnel.
- More interested in learning about military careers.
- More excited about their futures.
- Focus more on their future potential.
- More interested in learning about engineering.
- More interested in learning about science.

31 The items making up this scale were not included in the regression analysis to maintain independence between predictor and outcome measures.
Table 53: Drivers of Key Target Ratings

**Drivers of “Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions” (R² = .665*)**

- Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields.
- More interested in learning about military careers.
- DoD STARBASE has helped to improve students’ appreciation of how math can be applied to a variety of situations.
- More interested in learning about science.
- The students talk about DoD STARBASE long after the program has ended.

**Drivers of “Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields” (R² = .785*)**

- Attending DoD STARBASE helps students understand better that developing their current skills/abilities is necessary to have good future career choices.
- Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions.
- More willing to cooperate with each other.
- DoD STARBASE has helped to improve the students’ understanding of science.
- More excited about their futures.
- More comfortable with military personnel.

**Drivers of “Attending DoD STARBASE helps students understand better that developing their current skills/abilities is necessary to have good future career choices” (R² = .746*)**

- Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields.
- The students talk about DoD STARBASE long after the program has ended.
- I would like more DoD STARBASE supplemental resources to take back to my classroom.
- DoD STARBASE helps to improve cooperative learning in the classroom even after the program ended.
- More interested in learning about math.

**Drivers of “Students are more interested in learning about military careers” (R² = .741*)**

- Have more questions about DoD and other non-military career opportunities.
- More comfortable with military personnel.
- More excited about their futures.
- Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions.
- Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields.
- Focus more on their future potential.

*Statistically significant Multiple Correlations (p<.05)
Drivers of “Students are more ready to set future educational and career goals” (R² = 0.803*)

- Focus more on their future potential.
- More interested in learning about engineering.
- More likely to encourage each other.
- Attending DoD STARBASE helps students understand better how STEM skills/abilities fit job requirements for certain career fields.
- More excited about their futures.

Drivers of “Students seem to have more questions about DoD and other non-military career opportunities after DoD STARBASE” (R² = 0.724*)

- More interested in learning about military careers.
- Focus more on their future potential.
- More interested in learning about engineering.
- The DoD STARBASE experience has influenced me to become skilled in STEM instruction.

Drivers of “Students seem to focus more on their future potential after DoD STARBASE” (R² = 0.813*)

- More ready to set future educational and career goals.
- More excited about their futures.
- Have more questions about DoD and other non-military career opportunities.
- More comfortable making decisions.
- My school plans to participate in the DoD STARBASE program again next year.

*Statistically significant Multiple Correlations (p<.05)
Conclusions

The DoD STARBASE program continues to provide STEM-related academic activities and exposure to future professional opportunities for both students and their teachers all across the country. Survey results consistently show favorable shifts in teachers’ opinions of their own awareness of STEM-related opportunities for students, as well as their opinions on the positive and lasting outcomes DoD STARBASE academy has on their students, as evidence for the ongoing success of the DoD STARBASE program.

For some participating schools, DoD STARBASE is the primary STEM program that is available to students. The teachers report that participation in this DoD program appears to create an excitement within the students about their careers and future potential that may not be available otherwise. Specifically, teachers attending the DoD STARBASE program report that the students:

- Talk about DoD STARBASE long after the program ended (6.56)
- Understand better how STEM skills/abilities fit job requirements for certain career fields (6.42)
- Understand better that developing their current skills/abilities is necessary to have good future career choices (6.41)
- DoD STARBASE helps to improve cooperative learning in the classroom even after the program ends (6.18)
- Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions. (6.12)

When students and teachers share time with DoD sponsored instructors who have specialized training in STEM concepts, teachers get exposure to top level STEM teaching techniques, and students learn to link STEM concepts to “real-world” applications. Teachers value the awareness and hands on experience in STEM concepts that DoD STARBASE program can bring to students, along with reinforcing positive attitudes and behaviors. DoD STARBASE also provides teachers with additional resources and support, which may be particularly welcomed by teachers from the lesser advantaged school systems that are likely to participate in DoD STARBASE academies. Also, after attending a DoD STARBASE academy, teachers that do not have the background or formal education and training in STEM fields report:

- being more aware of STEM-related opportunities for students;
- being more likely to suggest DoD and military careers to students; and
- being “influenced to become skilled in STEM instruction.”

Although DoD STARBASE is technically a youth program, the teachers who attend also benefit from exposure to the topics and the teaching methods. The results presented in this report and in prior years strongly suggest that many teachers who attend DoD STARBASE leave with a renewed appreciation for STEM related topics including academic and professional opportunities for their students. Consequently, they are likely to continue to support the mission of DoD STARBASE, both within and beyond the program, for the rest of their teaching careers. The fact that DoD STARBASE has such a positive impact on adult Teacher participants is important evidence that the program is succeeding in its goal of promoting STEM interested in student youth across the USA.

32 Likert scale based on response options from 1 (Disagree) to 7 (Agree).
CONSIDERATIONS FOR THE 2019 PROGRAM YEAR

The assessment process captures valuable information from each of key participant groups such as classroom teachers, school administrators, military base personnel, base commanders, DoD STARBASE staff, students, volunteers, and interested observers of the program. This information is documented through surveys, reports on operational activities, after-action evaluations, compliance activities, academy visitation reports, reviews of academy documents, observations of program activity, and special ad-hoc studies on newly established initiatives. The following proposed list of “considerations” has been developed based on that input. The objective of this section is to guide planned and purposeful improvement in every dimension of the DoD STARBASE program. The key “considerations” for the 2019 program year include:

Key Participant Group Involvement

• Engagement with program managers and supporting not-for-profit organizations should be focused on developing consistent messaging for their further communications efforts, so that DoD STARBASE is represented accurately and appropriately in all contexts.

Program Oversight

• Obtain OASD/M&RA interim guidance memo/policy letter as a supplement to the current DoDI until a new DoDI is developed. This includes:
  o Clarification on the number of required DoD STARBASE classes per dedicated STARBASE classroom. (i.e. 28 classes per dedicated classroom)
  o Clarification on the number of required DoD STARBASE instructors per dedicated classroom when conducting DoD STARBASE classes. (i.e. two DoD STARBASE instructors or an instructor and an aide)
  o Documentation of the DoD STARBASE standard objectives and activities permitted.
  o Elimination of four-day academy option.
• Pilot LEVEL III (High Performing Academy) evaluation process and analyze results.

Program Guidance

• Prepare and finalize a new DoDI.
• Facilitate a strategic meeting between select DoD STARBASE 2.0 program directors (old and new) to create a new 2.0 implementation guide.
• Develop consistent messaging for DoD STARBASE directors’ communications efforts, so that DoD STARBASE is represented accurately and appropriately in all contexts.

Outreach

• As part of supplemental or outreach activities, encourage/require DoD STARBASE directors to facilitate student participation in local and state STEM summer programs by coordinating student placement with priority to groups underrepresented and underserved in STEM.
• Require DoD STARBASE locations piloting a 2.0 program to submit an after-action report to identify best practices, lessons learned and their plans for full implementation of their 2.0 program.
Program Operations

• Request a data-call on supplemental and summer programming to aide in developing directives regarding DoD STARBASE programming when schools are not in succession.

• Expand details of budget request to include proposal for number of simultaneous DoD STARBASE classroom(s) with staffing complement, plans for 2.0 programming, 2.0 staffing needs, supplemental programming and programming when schools are not in session.

• Conduct a full analysis of current DoD funding provided to programs, by performance levels, to develop updated baseline budgetary framework for each level. This should include:
  o Defining what is needed, financially, to operate at Levels I, II and III
  o Funding needed for STARBASE 2.0 initiatives
  o Funding needed for supplemental programming
• Expand expenditure data collection from locations to include differences between part-time and full-time staffs.

• Initiate conversation to facilitate improved partnerships with JROTC.

• Match new DoD STARBASE programs with a Level III DoD STARBASE location that will serve in a mentorship role for their first two years of operation.

Curriculum

• Collect a correlation of STARBASE Objectives to State/Local Objectives from each STARBASE location.

“DoD STARBASE is engaging to students, and I see students bring what they have learned back into the classroom.”

- MARK CARLSON, EDUCATOR AT DELTON KELLOGG MIDDLE SCHOOL, ATTENDING STARBASE BATTLE CREEK
Appendix A: Definitions for Statistical Analyses within this Report

The following section provides a list of the statistical formulas that were used to calculate the data presented in this report.

1. **Mean** – Average value of a variable
   \[ \bar{X} = \frac{\sum X}{N} \]
   \( \bar{X} \) = the sample mean; \( \bar{X} \) is generally represented by a capital ‘X’ with a bar or line over the top
   \( \sum X \) = the sum of all values of \( X \)
   \( N \) = the sample size

2. **Standard deviation** – Measure of the average deviation of each score from the mean
   \[ s = \left( \frac{\sum (X - \bar{X})^2}{n-1} \right)^{1/2} \]
   \( n \) = the sample size.

3. **t-test** – Tests the difference between two means
   \[ t = \frac{\bar{X}_1 - \bar{X}_2}{s_{\bar{X}_1-\bar{X}_2}} \]
   \( s_{\bar{X}_1-\bar{X}_2} \) = the standard deviation of the difference between the two variables

4. **F-test** – Tests the differences between multiple group means
   \[ F = \frac{MS_b}{MS_w} \]
   \( MS_b = \sum nk(X_{bark} - \bar{X}_{bar})^2/(K - 1) \)
   \( MS_w = \sum \sum (X_{ik} - X_{bark})^2/(N-K) \)
   \( X_{ik} \) = the value of the variable obtained by the \( i \)th person in the \( k \)th group
   \( X_{bark} \) = the mean of the \( k \)th group
   \( \bar{X}_{bar} \) = the grand mean overall of all groups
   \( nk \) = the size of the \( k \)th group
   \( N \) = the total sample size of all groups
   \( K \) = the total number of groups

5. **Pearson’s Correlation** – Determines the relationship between two variables
   \[ r_{12} = \frac{[\sum Y_1 \cdot Y_2 - \sum Y_1 \cdot \sum Y_2/N]/(N-1)}{sy1sy2} \]
   \( r \) = the statistical relationship of two variables
   \( Y \) = the values of the variables
   \( s \) = the standard deviation of the variables

6. **Multiple Correlation (R)** – Represents the correlation or statistical relationship between a set of variables and a single variable

7. **Regression Equation** – Determines what combination of variables can best predict the outcome for the dependent variable
   \[ Y = a + b_1X_1 + b_2X_2 + \ldots + b_pX_p \]
   \( Y \) = the predicted value of the dependent variable
   \( a \) = the intercept value of \( Y \) when \( X \)=0
   \( b \) = the regression coefficients for the predictors
   \( X \) = the value of the predictor variable
“The work the DoD STARBASE 2.0 Team is doing is of importance to humanity, because every time kids feel empowered, they are inclined to strive toward greatness.”

- ED SCOTT, PARENT OF A STUDENT AT BRIXNER JR HIGH SCHOOL, ATTENDING STARBASE KINGSLEY
Appendix B: STARBASE Locations by Military Component and Region
Locations Based on Military Component (2018)
### Appendix B: STARBASE Locations by Military Component and Region, (cont.)

**DoD STARBASE Locations Across Geographic Regions (2018)**

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## Appendix C: Expressed Attitudinal Differences by Gender

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</tr>
<tr>
<td>Boys</td>
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<td>12 I like engineering.</td>
<td>Boys</td>
<td>5.75</td>
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<td>4.79</td>
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<td>5.25</td>
<td>0.47</td>
</tr>
<tr>
<td>Boys</td>
<td>5.72</td>
<td>22 I enjoy learning about science, technology, math, and engineering topics.</td>
<td>Boys</td>
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<tr>
<td>Girls</td>
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<tr>
<td>Boys</td>
<td>5.50</td>
<td>17 Jobs that use math, engineering, technology and science are exciting.</td>
<td>Boys</td>
<td>5.64</td>
<td>0.12</td>
</tr>
<tr>
<td>Girls</td>
<td>5.33</td>
<td></td>
<td>Girls</td>
<td>5.47</td>
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<td>5.57</td>
<td>Science Confidence</td>
<td>Boys</td>
<td>5.76</td>
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<td>1 I am good at science.</td>
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<td>0.38</td>
</tr>
<tr>
<td>Girls</td>
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<td>0.33</td>
</tr>
<tr>
<td>Boys</td>
<td>5.02</td>
<td>2 Learning about science is easy for me.</td>
<td>Boys</td>
<td>5.34</td>
<td>0.35</td>
</tr>
<tr>
<td>Girls</td>
<td>4.76</td>
<td></td>
<td>Girls</td>
<td>5.10</td>
<td>0.35</td>
</tr>
<tr>
<td>Boys</td>
<td>6.23</td>
<td>10 I like doing science experiments.</td>
<td>Boys</td>
<td>6.43</td>
<td>0.21</td>
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<tr>
<td>Girls</td>
<td>6.41</td>
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<tr>
<td>Boys</td>
<td>5.89</td>
<td>15 I would like to know more about science.</td>
<td>Boys</td>
<td>5.78</td>
<td>-0.12</td>
</tr>
<tr>
<td>Girls</td>
<td>5.82</td>
<td></td>
<td>Girls</td>
<td>5.75</td>
<td>-0.06</td>
</tr>
<tr>
<td>Boys</td>
<td>5.82</td>
<td>STEM Motivation &amp; Behavior</td>
<td>Boys</td>
<td>6.02</td>
<td>0.24</td>
</tr>
<tr>
<td>Girls</td>
<td>5.80</td>
<td></td>
<td>Girls</td>
<td>5.99</td>
<td>0.23</td>
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</table>
### Appendix C: Expressed Attitudinal Differences by Gender, (cont.)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Pre-Test Mean</th>
<th>Attitude</th>
<th>Gender</th>
<th>Post-Test Mean</th>
<th>Post-Pre Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>5.94</td>
<td>16 Math is important for developing new technology.</td>
<td>Boys</td>
<td>6.17</td>
<td>0.24</td>
</tr>
<tr>
<td>Girls</td>
<td>5.96</td>
<td></td>
<td>Girls</td>
<td>6.14</td>
<td>0.19</td>
</tr>
<tr>
<td>Boys</td>
<td>5.77</td>
<td>14 Math is really useful for solving engineering problems.</td>
<td>Boys</td>
<td>6.07</td>
<td>0.32</td>
</tr>
<tr>
<td>Girls</td>
<td>5.78</td>
<td></td>
<td>Girls</td>
<td>6.09</td>
<td>0.32</td>
</tr>
<tr>
<td>Boys</td>
<td>5.85</td>
<td>21 Most people use science, technology, math or engineering skills every day.</td>
<td>Boys</td>
<td>6.14</td>
<td>0.32</td>
</tr>
<tr>
<td>Girls</td>
<td>6.01</td>
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<td>Girls</td>
<td>6.21</td>
<td>0.21</td>
</tr>
<tr>
<td>Boys</td>
<td>5.79</td>
<td>27 A lot of good jobs use math to solve problems.</td>
<td>Boys</td>
<td>5.91</td>
<td>0.13</td>
</tr>
<tr>
<td>Girls</td>
<td>5.80</td>
<td></td>
<td>Girls</td>
<td>5.95</td>
<td>0.14</td>
</tr>
<tr>
<td>Boys</td>
<td>5.72</td>
<td>8 Engineers help solve challenging problems.</td>
<td>Boys</td>
<td>6.14</td>
<td>0.43</td>
</tr>
<tr>
<td>Girls</td>
<td>5.71</td>
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<td>Girls</td>
<td>6.11</td>
<td>0.42</td>
</tr>
<tr>
<td>Boys</td>
<td>5.89</td>
<td>20 I am aware of some jobs that use math, science, engineering, or technology.</td>
<td>Boys</td>
<td>6.15</td>
<td>0.27</td>
</tr>
<tr>
<td>Girls</td>
<td>5.85</td>
<td></td>
<td>Girls</td>
<td>6.09</td>
<td>0.27</td>
</tr>
<tr>
<td>Boys</td>
<td>5.96</td>
<td>30 Learning about science, engineering, technology, and math will help me in my daily life.</td>
<td>Boys</td>
<td>6.08</td>
<td>0.13</td>
</tr>
<tr>
<td>Girls</td>
<td>5.89</td>
<td></td>
<td>Girls</td>
<td>5.99</td>
<td>0.12</td>
</tr>
<tr>
<td>Boys</td>
<td>5.95</td>
<td>26 Scientists work on things that make life better.</td>
<td>Boys</td>
<td>6.14</td>
<td>0.22</td>
</tr>
<tr>
<td>Girls</td>
<td>5.91</td>
<td></td>
<td>Girls</td>
<td>6.11</td>
<td>0.20</td>
</tr>
<tr>
<td>Boys</td>
<td>5.48</td>
<td>4 I am good at math.</td>
<td>Boys</td>
<td>5.56</td>
<td>0.08</td>
</tr>
<tr>
<td>Girls</td>
<td>5.28</td>
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<td>Girls</td>
<td>5.38</td>
<td>0.12</td>
</tr>
<tr>
<td>Boys</td>
<td>5.91</td>
<td>Military Setting Endorsement</td>
<td>Boys</td>
<td>6.06</td>
<td>0.16</td>
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<td>Girls</td>
<td>5.93</td>
<td>0.30</td>
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<tr>
<td>Boys</td>
<td>5.37</td>
<td>9 A military base is a good place to work.</td>
<td>Boys</td>
<td>5.55</td>
<td>0.19</td>
</tr>
<tr>
<td>Girls</td>
<td>5.24</td>
<td></td>
<td>Girls</td>
<td>5.56</td>
<td>0.33</td>
</tr>
<tr>
<td>Boys</td>
<td>6.09</td>
<td>3 Military bases are exciting.</td>
<td>Boys</td>
<td>6.15</td>
<td>0.07</td>
</tr>
<tr>
<td>Girls</td>
<td>5.66</td>
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<td>Girls</td>
<td>5.88</td>
<td>0.22</td>
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<tr>
<td>Boys</td>
<td>6.26</td>
<td>23 People who work for military do lots of different things.</td>
<td>Boys</td>
<td>6.35</td>
<td>0.10</td>
</tr>
<tr>
<td>Girls</td>
<td>6.13</td>
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<td>Girls</td>
<td>6.33</td>
<td>0.20</td>
</tr>
<tr>
<td>Boys</td>
<td>5.94</td>
<td>28 People who work for the military use technology in their jobs.</td>
<td>Boys</td>
<td>6.21</td>
<td>0.27</td>
</tr>
<tr>
<td>Girls</td>
<td>5.57</td>
<td></td>
<td>Girls</td>
<td>5.96</td>
<td>0.42</td>
</tr>
<tr>
<td>Boys</td>
<td>4.91</td>
<td>Teacher Support for STEM</td>
<td>Boys</td>
<td>5.03</td>
<td>0.12</td>
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<td>Girls</td>
<td>5.05</td>
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<td>Girls</td>
<td>5.08</td>
<td>0.04</td>
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<tr>
<td>Boys</td>
<td>5.29</td>
<td>7 Teachers at my school are excited about science.</td>
<td>Boys</td>
<td>5.31</td>
<td>0.01</td>
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<tr>
<td>Girls</td>
<td>5.39</td>
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<td>Girls</td>
<td>5.31</td>
<td>-0.09</td>
</tr>
<tr>
<td>Boys</td>
<td>4.52</td>
<td>11 Teachers at my school talk about why technology is important.</td>
<td>Boys</td>
<td>4.77</td>
<td>0.22</td>
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<td>Girls</td>
<td>4.71</td>
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<td>Girls</td>
<td>4.85</td>
<td>0.16</td>
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### Appendix C: Expressed Attitudinal Differences by Gender, (cont.)

<table>
<thead>
<tr>
<th>Gender</th>
<th>Pre-Test Mean</th>
<th>Attitude</th>
<th>Gender</th>
<th>Post-Test Mean</th>
<th>Post-Pre Gap</th>
</tr>
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<tbody>
<tr>
<td>Boys</td>
<td>5.89</td>
<td>General Program Evaluation</td>
<td>Boys</td>
<td>6.05</td>
<td>0.16</td>
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<td>Girls</td>
<td>6.18</td>
<td>0.24</td>
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<tr>
<td>Boys</td>
<td>5.78</td>
<td>18 I would be interested in a STARBASE club at my school if it were offered.</td>
<td>Boys</td>
<td>5.61</td>
<td>-0.16</td>
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<td>5.79</td>
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<td>5.80</td>
<td>0.02</td>
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<tr>
<td>Boys</td>
<td>6.00</td>
<td>25 I do not think DoD STARBASE will help me do better in school. (Reverse Scored)</td>
<td>Boys</td>
<td>6.13</td>
<td>0.15</td>
</tr>
<tr>
<td>Girls</td>
<td>6.11</td>
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<td>Girls</td>
<td>6.19</td>
<td>0.1</td>
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<tr>
<td></td>
<td></td>
<td>37 I think almost any kid would have fun learning</td>
<td>Boys</td>
<td>5.87</td>
<td>-</td>
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<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>6.06</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>31 I think I will remember enjoying my time at DoD STARBASE.</td>
<td>Boys</td>
<td>6.27</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>6.40</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>33 DoD STARBASE is boring. (Reverse Scored)</td>
<td>Boys</td>
<td>6.16</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>6.21</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>36 DoD STARBASE Instructors made learning about science, technology, engineering, and math topics fun.</td>
<td>Boys</td>
<td>6.15</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>6.31</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34 At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>Boys</td>
<td>6.34</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Girls</td>
<td>6.39</td>
<td>-</td>
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<tr>
<td></td>
<td></td>
<td>35 I will tell others about my DoD STARBASE experience.</td>
<td>Boys</td>
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<td></td>
<td></td>
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<td>Girls</td>
<td>6.08</td>
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### Appendix D: PCA Analysis of Attitude Dimensions

Items were assigned to Attitude Dimensions based on their highest loadings on the seven factors shown below. Factors are listed in order of contribution to the results.

**1. Loadings of Attitude Items on Seven Factors, 2015**

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>Future Planning</th>
<th>Science Confidence</th>
<th>Program Evaluation</th>
<th>STEM Behavior/Motivation</th>
<th>Military Setting Endorse</th>
<th>STEM Concept Awareness</th>
<th>Math Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would take engineering classes if offered.</td>
<td>0.736</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am interested in being a scientist or engineer.</td>
<td>0.723</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I like engineering.</td>
<td>0.692</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I want to learn more about engineering.</td>
<td>0.675</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I finish school, I would like to get a job where I could use STEM.</td>
<td>0.628</td>
<td></td>
<td>0.421</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I would like a job in a science-related area.</td>
<td>0.586</td>
<td>0.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy learning about STEM topics.</td>
<td>0.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEM jobs are exciting.</td>
<td>0.565</td>
<td></td>
<td></td>
<td>0.408</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like science.</td>
<td>0.781</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I am good at science.</td>
<td>0.768</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Learning about science is easy for me.</td>
<td>0.754</td>
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<td></td>
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<tr>
<td>I would like to take more science classes.</td>
<td>0.413</td>
<td>0.67</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>I would like to join a science club at my school.</td>
<td>0.397</td>
<td>0.629</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>DoD STARBASE is boring. (Reversed Scored)</td>
<td>0.761</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>DoD STARBASE Instructors made learning about STEM topics fun.</td>
<td>0.738</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would tell my friends to come to DoD STARBASE.</td>
<td>0.724</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>0.61</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do not think DoD STARBASE will help me do better in school. (Reversed Scored)</td>
<td>0.516</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>
Appendix D: PCA Analysis of Attitude Dimensions, (cont.)

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Future Planning</td>
</tr>
<tr>
<td>Most people use STEM skills every day.</td>
<td></td>
</tr>
<tr>
<td>I think learning about STEM topics will help me in my daily life.</td>
<td>0.38</td>
</tr>
<tr>
<td>I am aware of some STEM careers.</td>
<td>0.342</td>
</tr>
<tr>
<td>Scientists work on things that will make life better.</td>
<td></td>
</tr>
<tr>
<td>Engineers help solve challenging problems.</td>
<td></td>
</tr>
<tr>
<td>Military bases are exciting.</td>
<td></td>
</tr>
<tr>
<td>A military base is a good place to work.</td>
<td></td>
</tr>
<tr>
<td>People who work on a military base do lots of different things.</td>
<td>0.365</td>
</tr>
<tr>
<td>People who work for the military use technology in their jobs.</td>
<td>0.383</td>
</tr>
<tr>
<td>I have enjoyed coming to a military base.</td>
<td></td>
</tr>
<tr>
<td>I like technology.</td>
<td></td>
</tr>
<tr>
<td>I want to learn more about technology.</td>
<td>0.358</td>
</tr>
<tr>
<td>I like figuring out how to use technology gear (tablets, smart phones, etc.).</td>
<td></td>
</tr>
<tr>
<td>I would take classes on technology if available.</td>
<td>0.535</td>
</tr>
<tr>
<td>I like math.</td>
<td></td>
</tr>
<tr>
<td>I would like to take more math classes.</td>
<td></td>
</tr>
<tr>
<td>I am good at math.</td>
<td></td>
</tr>
<tr>
<td>I need to do well in math to get the kind of job I want.</td>
<td></td>
</tr>
</tbody>
</table>

In the interest of simplicity, loadings below .34 are not shown.
### Appendix D: PCA Analysis of Attitude Dimensions, (cont.)

#### 2. Loadings of Attitude Items on Seven Factors, 2016

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am interested in being a scientist or engineer.</td>
<td>0.736</td>
</tr>
<tr>
<td>I like engineering.</td>
<td>0.723</td>
</tr>
<tr>
<td>I want to learn more about engineering.</td>
<td>0.742</td>
</tr>
<tr>
<td>When I finish school, I would like to get a job where I could use STEM (Science, Technology, Engineering, and Math).</td>
<td>0.587 0.374</td>
</tr>
<tr>
<td>I enjoy learning about STEM (Science, Technology, Engineering, and Math) topics.</td>
<td>0.496 0.41</td>
</tr>
<tr>
<td>STEM (Science, Technology, Engineering, and Math) jobs are exciting.</td>
<td>0.561</td>
</tr>
<tr>
<td>I like science.</td>
<td>0.777</td>
</tr>
<tr>
<td>I am good at science.</td>
<td>0.795</td>
</tr>
<tr>
<td>Learning about science is easy for me.</td>
<td>0.758</td>
</tr>
<tr>
<td>I would like to learn more about science.</td>
<td>0.704</td>
</tr>
<tr>
<td>I would join a science club at my school if it was offered.</td>
<td>0.401 0.594</td>
</tr>
<tr>
<td>DoD STARBASE is boring. (Reversed Scored)</td>
<td>0.791</td>
</tr>
<tr>
<td>DoD STARBASE Instructors made learning about STEM (Science, Technology, Engineering, and Math) topics fun.</td>
<td>0.743</td>
</tr>
<tr>
<td>I will tell others about my DoD STARBASE experience.</td>
<td>0.638</td>
</tr>
<tr>
<td>At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>0.663</td>
</tr>
<tr>
<td>I do not think DoD STARBASE will help me do better in school. (Reversed Scored)</td>
<td>0.642</td>
</tr>
</tbody>
</table>
## Appendix D: PCA Analysis of Attitude Dimensions, (cont.)

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>Future Planning</th>
<th>Science Confidence</th>
<th>Program Evaluation</th>
<th>STEM Behavior/Motivation</th>
<th>Military Setting Endorse</th>
<th>STEM Concept Awareness</th>
<th>Math Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most people use STEM (Science, Technology, Engineering, and Math) skills every day.</td>
<td></td>
<td></td>
<td></td>
<td>0.726</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I think learning about STEM (Science, Technology, Engineering, and Math) topics will help me in my daily life.</td>
<td></td>
<td></td>
<td></td>
<td>0.559</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am aware of some STEM, (Science, Technology, Engineering, and Math) jobs.</td>
<td></td>
<td></td>
<td></td>
<td>0.551</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientists work on things that will make life better.</td>
<td>0.465</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineers help solve challenging problems.</td>
<td>0.495</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Military bases are exciting.</td>
<td>0.426</td>
<td>0.564</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A military base is a good place to work.</td>
<td>0.613</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People who work for the military do lots of different things.</td>
<td>0.355</td>
<td>0.58</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>People who work for the military use technology in their jobs.</td>
<td>0.446</td>
<td>0.562</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have enjoyed coming to a military location.</td>
<td>0.615</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My teacher is excited about science.*</td>
<td>0.553</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My teacher thinks technology is important.*</td>
<td>0.538</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like technology.</td>
<td>0.801</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I want to learn more about technology.</td>
<td>0.735</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I like figuring out how to use technology (computers, tablets, smart phones, etc.).</td>
<td>0.702</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>I like math.</td>
<td>0.904</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>I would like to learn more about math.</td>
<td>0.860</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I am good at math.</td>
<td>0.809</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I must do well in math to get the kind of job I want.</td>
<td>0.466</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*New items were not used on the factor to maximize similarity to 2015 results
### Appendix D: PCA Analysis of Attitude Dimensions, (cont.)

**3. Loadings of Attitude Items on Seven Factors, 2017**

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>Future Planning</th>
<th>Science Confidence</th>
<th>Program Evaluation</th>
<th>STEM Behavior/Motivation</th>
<th>Military Setting Endorse</th>
<th>STEM Concept Awareness</th>
<th>Teacher Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS19 I am interested in being a scientist or engineer.</td>
<td>0.737</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS29 When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.</td>
<td>0.694</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PS13 I want to learn more about engineering.</td>
<td>0.657</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS12 I like engineering.</td>
<td>0.627</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS22 I enjoy learning about science, technology, math, and engineering topics.</td>
<td>0.562</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS17 Jobs that use math, engineering, technology and science are exciting.</td>
<td>0.551</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS1 I am good at science.</td>
<td>0.824</td>
<td></td>
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</tr>
<tr>
<td>PS2 Learning about science is easy for me.</td>
<td>0.775</td>
<td></td>
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<tr>
<td>PS15 I would like to know more about science.</td>
<td>0.374 0.457</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS4 I am good at math.</td>
<td>0.395</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS10 I like doing science experiments.</td>
<td>0.390</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>PS36 I think almost any kid would have fun learning at DoD STARBASE.</td>
<td></td>
<td>0.763</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS35 DoD STARBASE Instructors made learning about science, technology, engineering, and math topics fun.</td>
<td></td>
<td></td>
<td>0.752</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS32r DoD STARBASE is boring. <em>(Reverse Scored)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.744</td>
</tr>
<tr>
<td>PS31 I think I will remember enjoying my time at DoD STARBASE.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.717</td>
</tr>
<tr>
<td>PS34 I will tell others about my DoD STARBASE experience.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.665</td>
</tr>
<tr>
<td>PS33 At DoD STARBASE, I learned a lot of things that I can use.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.661</td>
</tr>
<tr>
<td>PS18 I would be interested in a STARBASE club at my school if it were offered.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.636</td>
</tr>
</tbody>
</table>
### Appendix D: PCA Analysis of Attitude Dimensions, (cont.)

#### 3. Loadings of Attitude Items on Seven Factors, 2017

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>2017</th>
<th>Future Planning</th>
<th>Science Confidence</th>
<th>Program Evaluation</th>
<th>STEM Behavior/Motivation</th>
<th>Military Setting Endorse</th>
<th>STEM Concept Awareness</th>
<th>Teacher Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS25r I do not think DoD STARBASE will help me do better in school. (Reverse Scored)</td>
<td></td>
<td>0.514</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS27 A lot of good jobs use math to solve problems.</td>
<td></td>
<td></td>
<td></td>
<td>0.619</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS16 Math is important for developing new technology.</td>
<td></td>
<td></td>
<td></td>
<td>0.617</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS14 Math is really useful for solving engineering problems.</td>
<td></td>
<td>0.607</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS21 Most people use science, technology, math or engineering skills every day.</td>
<td></td>
<td>0.583</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS26 Scientists work on things that make life better.</td>
<td></td>
<td></td>
<td></td>
<td>0.541</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS28 People who work for the military use technology in their jobs.</td>
<td></td>
<td></td>
<td></td>
<td>0.539</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS30 Learning about science, engineering, technology, and math will help me in my daily life.</td>
<td></td>
<td></td>
<td></td>
<td>0.527</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS20 I am aware of some jobs that use math, science, engineering, or technology.</td>
<td></td>
<td></td>
<td></td>
<td>0.526</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS8 Engineers help solve challenging problems.</td>
<td></td>
<td></td>
<td></td>
<td>0.464</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS9 A military base is a good place to work.</td>
<td></td>
<td></td>
<td></td>
<td>0.709</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS3 Military bases are exciting.</td>
<td></td>
<td></td>
<td></td>
<td>0.637</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS23 People who work for the military do lots of different things.</td>
<td></td>
<td>0.425</td>
<td></td>
<td>0.528</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>PS6 I like technology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.786</td>
</tr>
<tr>
<td>PS5 I want to learn more about technology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.704</td>
</tr>
<tr>
<td>PS24 I like learning how technology works.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.641</td>
</tr>
<tr>
<td>PS7 Teachers at my school are excited about science.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.764</td>
</tr>
<tr>
<td>PS11 Teachers at my school talk about why technology is important.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.719</td>
</tr>
</tbody>
</table>
## Appendix D: PCA Analysis of Attitude Dimensions, (cont.)

4. Loadings of Attitude Items on Seven Factors, 2018

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program Evaluation</td>
</tr>
<tr>
<td>Pps37 I think almost any kid would have fun learning at DoD STARBASE.</td>
<td>.778</td>
</tr>
<tr>
<td>Pps31 I think I will remember enjoying my time at DoD STARBASE.</td>
<td>.776</td>
</tr>
<tr>
<td>Pps33r DoD STARBASE is boring. (Reverse Scored)</td>
<td>.765</td>
</tr>
<tr>
<td>Pps36 DoD STARBASE Instructors made learning about science, technology,</td>
<td>.763</td>
</tr>
<tr>
<td>engineering, and math topics fun.</td>
<td></td>
</tr>
<tr>
<td>Pps18 I would be interested in a STARBASE club at my school if it were offered.</td>
<td>.659</td>
</tr>
<tr>
<td>Pps34 At DoD STARBASE, I learned a lot of things that I can use.</td>
<td>.654</td>
</tr>
<tr>
<td>Pps35 I will tell others about my DoD STARBASE experience.</td>
<td>.610</td>
</tr>
<tr>
<td>Pps25r I do not think DoD STARBASE will help me do better in school.</td>
<td>.524</td>
</tr>
<tr>
<td>(Reverse Scored)</td>
<td></td>
</tr>
<tr>
<td>Pps16 Math is important for developing new technology.</td>
<td>.654</td>
</tr>
<tr>
<td>Pps14 Math is really useful for solving engineering problems.</td>
<td>.652</td>
</tr>
<tr>
<td>Pps21 Most people use science, technology, math or engineering skills every</td>
<td>.646</td>
</tr>
<tr>
<td>day.</td>
<td></td>
</tr>
<tr>
<td>Pps27 A lot of good jobs use math to solve problems.</td>
<td>.578</td>
</tr>
<tr>
<td>Pps8 Engineers help solve challenging problems.</td>
<td>.564</td>
</tr>
<tr>
<td>Pps20 I am aware of some jobs that use math, science, engineering, or</td>
<td>.538</td>
</tr>
<tr>
<td>technology.</td>
<td></td>
</tr>
<tr>
<td>Pps30 Learning about science, engineering, technology, and math will help</td>
<td>.359</td>
</tr>
<tr>
<td>me in my daily life.</td>
<td></td>
</tr>
<tr>
<td>Pps26 Scientists work on things that make life better.</td>
<td>.507</td>
</tr>
</tbody>
</table>
### Appendix D: PCA Analysis of Attitude Dimensions, (cont.)

4. Loadings of Attitude Items on Seven Factors, 2018

<table>
<thead>
<tr>
<th>Attitude Items</th>
<th>Program Evaluation</th>
<th>STEM Behavior/Motivation</th>
<th>Future Planning</th>
<th>Science Confidence</th>
<th>STEM Concept Awareness</th>
<th>Military Setting Endorse</th>
<th>Teacher Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pps4 I am good at math.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pps19 I am interested in being a scientist or engineer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pps29 When I finish school, I would like to get a job that has something to do with math, science, technology, or engineering.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pps13 I want to learn more about engineering.</td>
<td>.678</td>
<td></td>
<td></td>
<td>.347</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pps12 I like engineering.</td>
<td>.649</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.340</td>
</tr>
<tr>
<td>Pps22 I enjoy learning about science, technology, math, and engineering topics.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pps17 Jobs that use math, engineering, technology and science are exciting.</td>
<td>.325</td>
<td></td>
<td></td>
<td>.569</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pps1 I am good at science.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.782</td>
</tr>
<tr>
<td>Pps2 Learning about science is easy for me.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.773</td>
</tr>
<tr>
<td>Pps10 I like doing science experiments.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.571</td>
</tr>
<tr>
<td>Pps15 I would like to know more about science.</td>
<td>.307</td>
<td></td>
<td>.391</td>
<td></td>
<td>.559</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pps6 I like technology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.832</td>
</tr>
<tr>
<td>Pps5 I want to learn more about technology.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.757</td>
</tr>
<tr>
<td>Pps24 I like learning how technology works.</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.730</td>
</tr>
<tr>
<td>Pps9 A military base is a good place to work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.691</td>
</tr>
<tr>
<td>Pps3 Military bases are exciting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.659</td>
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### Appendix E: Intercorrelations Among Student Characteristics and Attitude Dimensions

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<th>I know someone who went through DoD STARBASE before me</th>
<th>I have met military people before coming to DoD STARBASE</th>
<th>Military Attitudes</th>
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*Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).
Appendix E: Intercorrelations Among Student Characteristics and Attitude Dimensions, (cont.)

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*Correlation is significant at the 0.05 level (2-tailed).  **Correlation is significant at the 0.01 level (2-tailed).
### Appendix E: Intercorrelations Among Student Characteristics and Attitude Dimensions, (cont.)

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*Correlation is significant at the 0.05 level (2-tailed).  **Correlation is significant at the 0.01 level (2-tailed).
### Appendix E: Intercorrelations Among Student Characteristics and Attitude Dimensions, (cont.)

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<tr>
<td>I know someone who went</td>
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<td>0.073**</td>
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<td>through DoD STARBASE before me</td>
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*Correlation is significant at the 0.05 level (2-tailed).  **Correlation is significant at the 0.01 level (2-tailed).
“DoD STARBASE allows all students to learn STEM objectives through exploration, observation, and hands on activities. Students truly enjoy the lessons. The specialized equipment and instructor's delivery make STARBASE an excellent learning experience.”

- LAURA STEWART, EDUCATOR AT PINCH ELEMENTARY SCHOOL, ATTENDING STARBASE WEST VIRGINIA-CHARLESTON
Appendix F: Pre/Post Knowledge Item Mean Scores and Percent Correct

The following table presents the gap difference for each item based on pre- to post-program percentage correct. The percentage of students answering an item correctly significantly increased for all items from pre- to post-program. Students who participate in DoD STARBASE come with a basic understanding of the concepts taught in the program, as evidenced by the percentage of students who answer certain items correctly pre-program. For example, less than half (44%) of the incoming students responded correctly to three questions about the elements of the engineering design process. The DoD STARBASE curriculum helped to boost that to nearly two-thirds (62%), an increase of 18%. Knowledge of concepts that were unknown pre-program typically had much larger increases after the program. For example, correct answers to the item asking about Bernoulli’s Principle increased from 7% to 70%, resulting in a 63% increase in those responding correctly pre- to post-program. Across individual items, the average increase in correct responding from pre- to post-program in 2017 was almost 28%, which compares favorably to the 25% gain in 2016, the 26% gain in 2015 and the 19% recorded in 2014.

Pre/Post Knowledge Item Mean Scores and Percent Correct (2014 – 2018)

<table>
<thead>
<tr>
<th>Knowledge Item</th>
<th>2014 Pre-Program</th>
<th>2014 Post-Program</th>
<th>2015 Pre-Program</th>
<th>2015 Post-Program</th>
<th>2016 Pre-Program</th>
<th>2016 Post-Program</th>
<th>2017 Pre-Program</th>
<th>2017 Post-Program</th>
<th>2018 Pre-Program</th>
<th>2018 Post-Program</th>
<th>2018 Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry Science (E3.1.1.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Sodium and chloride bond to form salt (NaCl). What does this bonded substance represent?**</td>
<td>--</td>
<td>--</td>
<td>55%</td>
<td>80%</td>
<td>60%</td>
<td>81%</td>
<td>57.23%</td>
<td>80.13%</td>
<td>57.45%</td>
<td>81.40%</td>
<td>23.95%</td>
</tr>
<tr>
<td>5. Which pie chart represents the correct composition of air?*</td>
<td>40%</td>
<td>53%</td>
<td>11%</td>
<td>79%</td>
<td>10%</td>
<td>80%</td>
<td>11.48%</td>
<td>80.76%</td>
<td>15.21%</td>
<td>78.57%</td>
<td>63.36%</td>
</tr>
<tr>
<td>11(10). Which of the following is an example of physical change?</td>
<td>35%</td>
<td>55%</td>
<td>33%</td>
<td>67%</td>
<td>35%</td>
<td>67%</td>
<td>36.13%</td>
<td>65.76%</td>
<td>36.27%</td>
<td>70.69%</td>
<td>34.42%</td>
</tr>
<tr>
<td>15(14). Which of the following states of matter have the least amount of kinetic energy?</td>
<td>36%</td>
<td>62%</td>
<td>37%</td>
<td>65%</td>
<td>40%</td>
<td>65%</td>
<td>37.49%</td>
<td>67.09%</td>
<td>32.02%</td>
<td>66.50%</td>
<td>34.48%</td>
</tr>
<tr>
<td>17(16). While testing how well a surface repels water you observe that a water droplet forms a contact angle greater than 90 degrees on the surface, the best conclusion drawn from this observation is that the surface is: (New item in 2017)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28.74%</td>
<td>63.54%</td>
<td>27.09%</td>
</tr>
<tr>
<td>Engineering (E3.1.1.4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Which of the following can NOT be learned from constructing a 3D scale model of a car?**</td>
<td>--</td>
<td>--</td>
<td>37%</td>
<td>54%</td>
<td>38%</td>
<td>51%</td>
<td>30.91%</td>
<td>53.73%</td>
<td>34.24%</td>
<td>51.11%</td>
<td>16.87%</td>
</tr>
<tr>
<td>3. A team of engineers is designing a new car seat for babies that can transform into a stroller and a backpack carrier. According to the Engineering Design Process, why will they make a prototype of their idea? An Engineering team is meeting for the first time. According to the Engineering Design Process, what will they be doing first?****</td>
<td>64%</td>
<td>77%</td>
<td>67%</td>
<td>80%</td>
<td>70%</td>
<td>79%</td>
<td>62.32%</td>
<td>70.19%</td>
<td>31.40%</td>
<td>59.30%</td>
<td>27.90%</td>
</tr>
<tr>
<td>10(9). In the graph above, find the letter that is at the coordinates (3,-2). Is it A, B, C, or D?</td>
<td>49%</td>
<td>66%</td>
<td>45%</td>
<td>65%</td>
<td>52%</td>
<td>67%</td>
<td>46.77%</td>
<td>66.55%</td>
<td>47.04%</td>
<td>67.98%</td>
<td>20.94%</td>
</tr>
<tr>
<td>12(11). When using computer design software to build a model, the first step is to:**</td>
<td>41%</td>
<td>62%</td>
<td>38%</td>
<td>63%</td>
<td>36.56%</td>
<td>57.41%</td>
<td>38.98%</td>
<td>62.44%</td>
<td>23.46%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Item content modified from last administration  **New item in 2015  ***New item in 2017  ****New item in 2018
## Appendix F: Pre/Post Knowledge Item Mean Scores and Percent Correct, (cont.)

### Pre/Post Knowledge Item Mean Scores and Percent Correct (2014 – 2018)

<table>
<thead>
<tr>
<th>Knowledge Item</th>
<th>2014 Pre-Program</th>
<th>2014 Post-Program</th>
<th>2015 Pre-Program</th>
<th>2015 Post-Program</th>
<th>2016 Pre-Program</th>
<th>2016 Post-Program</th>
<th>2017 Pre-Program</th>
<th>2017 Post-Program</th>
<th>2018 Pre-Program</th>
<th>2018 Post-Program</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mathematics Operations &amp; Applications (E3.1.1.5)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Which of the following is typically measured in nanometers?</td>
<td>41%</td>
<td>69%</td>
<td>38%</td>
<td>71%</td>
<td>39%</td>
<td>73%</td>
<td>37.31%</td>
<td>75.06%</td>
<td>35.53%</td>
<td>71.06%</td>
<td>35.53%</td>
</tr>
<tr>
<td>9B. Which of the following would be a good reason to use latitude and longitude coordinates?</td>
<td>41%</td>
<td>69%</td>
<td>45%</td>
<td>73%</td>
<td>45%</td>
<td>74%</td>
<td>41.22%</td>
<td>71.58%</td>
<td>42.06%</td>
<td>70.38%</td>
<td>28.32%</td>
</tr>
<tr>
<td>13(12). Of the following, which tool would be appropriate to measure the volume of a glass of milk?</td>
<td>53%</td>
<td>75%</td>
<td>54%</td>
<td>80%</td>
<td>56%</td>
<td>81%</td>
<td>51.52%</td>
<td>80.06%</td>
<td>56.47%</td>
<td>81.04%</td>
<td>24.63%</td>
</tr>
<tr>
<td>16(15). An engineer is testing how well three different towels absorb liquids over three trials. The data for the experiment is in the table below. Select the graph that correctly represents the data of the experiment**.</td>
<td>55%</td>
<td>67%</td>
<td>57%</td>
<td>70%</td>
<td>51%</td>
<td>63%</td>
<td>53.07%</td>
<td>67.15%</td>
<td>52.65%</td>
<td>68.04%</td>
<td>15.39%</td>
</tr>
<tr>
<td><strong>Physics (E3.1.1.1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Two boats are floating by each other and passing cargo from one boat to the other. Based on Bernoulli’s Principle, what happens if water is forced between the two boats?</td>
<td>6%</td>
<td>68%</td>
<td>8%</td>
<td>68%</td>
<td>6%</td>
<td>67%</td>
<td>7.26%</td>
<td>69.87%</td>
<td>7.20%</td>
<td>66.44%</td>
<td>59.24%</td>
</tr>
<tr>
<td>14(13). What scientific law makes it important to wear a seat belt?</td>
<td>38%</td>
<td>72%</td>
<td>37%</td>
<td>70%</td>
<td>38%</td>
<td>71%</td>
<td>41.46%</td>
<td>70.63%</td>
<td>35.22%</td>
<td>67.00%</td>
<td>31.78%</td>
</tr>
<tr>
<td><strong>Technology (E3.1.1.3)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. What feature will open when you touch the screen on this cell phone at coordinates -1, +1?***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35.51%</td>
<td>45.11%</td>
<td>34.54%</td>
<td>55.08%</td>
<td>20.54%</td>
</tr>
<tr>
<td>18(17). You start out at the flag (coordinates -1, 3) and walk two kilometers North, then 1 kilometer West and stop for lunch. After lunch, you head to your friend’s house which is five kilometers to the East. Where does your friend live?</td>
<td>59%</td>
<td>70%</td>
<td>62%</td>
<td>75%</td>
<td>65%</td>
<td>75%</td>
<td>65.98%</td>
<td>77.28%</td>
<td>36.76%</td>
<td>54.62%</td>
<td>17.86%</td>
</tr>
<tr>
<td><strong>STEM Awareness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19(8). STEM (Science, Technology, Engineering, and Math) jobs can involve which of the following?***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>73%</td>
<td>80%</td>
<td>74%</td>
<td>82%</td>
<td>44.80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>59.49%</td>
<td>42.06%</td>
<td>57.91%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Item content modified from last administration  **New item in 2015  ***New item in 2017  ****New item in 2018
## Appendix G: Mean Ratings by Measurement Area

<table>
<thead>
<tr>
<th>Measurement Area</th>
<th>Cronbach’s Alpha Reliability</th>
<th>N of Items</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEM Concepts</strong></td>
<td>.858</td>
<td>6</td>
<td>6.38</td>
<td>.663</td>
<td>2,630</td>
</tr>
<tr>
<td>While attending DoD STARBASE, the students appear...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>... more interested in learning about technology.</td>
<td></td>
<td></td>
<td>6.50</td>
<td>.785</td>
<td>2630</td>
</tr>
<tr>
<td>... more interested in learning about science.</td>
<td></td>
<td></td>
<td>6.48</td>
<td>.792</td>
<td>2630</td>
</tr>
<tr>
<td>... more interested in learning about engineering.</td>
<td></td>
<td></td>
<td>6.23</td>
<td>.918</td>
<td>2630</td>
</tr>
<tr>
<td>... more interested in learning about math.</td>
<td></td>
<td></td>
<td>5.92</td>
<td>1.161</td>
<td>2630</td>
</tr>
<tr>
<td><strong>DoD STARBASE has helped to improve the students’ understanding of science.</strong></td>
<td></td>
<td></td>
<td>6.72</td>
<td>.611</td>
<td>2630</td>
</tr>
<tr>
<td><strong>DoD STARBASE has helped to improve students’ appreciation of how math can be applied to a variety of situations.</strong></td>
<td></td>
<td></td>
<td>6.45</td>
<td>.843</td>
<td>2630</td>
</tr>
<tr>
<td><strong>Confidence</strong></td>
<td>.842</td>
<td>3</td>
<td>6.17</td>
<td>.812</td>
<td>2,630</td>
</tr>
<tr>
<td>While attending DoD STARBASE, the students appear...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>... more willing to try new things.</td>
<td></td>
<td></td>
<td>6.45</td>
<td>0.8233</td>
<td>2630</td>
</tr>
<tr>
<td>... more confident about what they can accomplish.</td>
<td></td>
<td></td>
<td>6.24</td>
<td>.9099</td>
<td>2630</td>
</tr>
<tr>
<td>... more comfortable making decisions.</td>
<td></td>
<td></td>
<td>5.84</td>
<td>1.0480</td>
<td>2630</td>
</tr>
<tr>
<td><strong>Behavioral/Motivational</strong></td>
<td>.752</td>
<td>5</td>
<td>6.08</td>
<td>.788</td>
<td>2,630</td>
</tr>
<tr>
<td>While attending DoD STARBASE, the students appear...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>... more excited about learning.</td>
<td></td>
<td></td>
<td>6.28</td>
<td>.907</td>
<td>2630</td>
</tr>
<tr>
<td>... better at following directions.</td>
<td></td>
<td></td>
<td>5.70</td>
<td>1.222</td>
<td>2630</td>
</tr>
<tr>
<td>DoD STARBASE reinforces many positive behaviors I try to teach my students.</td>
<td></td>
<td></td>
<td>6.68</td>
<td>.759</td>
<td>2630</td>
</tr>
<tr>
<td>During DoD STARBASE, students have better school attendance.</td>
<td></td>
<td></td>
<td>5.81</td>
<td>1.382</td>
<td>2630</td>
</tr>
<tr>
<td>The DoD STARBASE experience has influenced me to become skilled in STEM instruction.</td>
<td></td>
<td></td>
<td>5.92</td>
<td>1.176</td>
<td>2630</td>
</tr>
<tr>
<td><strong>Teamwork</strong></td>
<td>.908</td>
<td>3</td>
<td>6.04</td>
<td>.908</td>
<td>2,630</td>
</tr>
<tr>
<td>While attending DoD STARBASE, the students appear...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>... more willing to cooperate with each other.</td>
<td></td>
<td></td>
<td>6.08</td>
<td>1.001</td>
<td>2630</td>
</tr>
<tr>
<td>... better at working in groups.</td>
<td></td>
<td></td>
<td>6.03</td>
<td>1.085</td>
<td>2630</td>
</tr>
<tr>
<td>... more likely to encourage each other.</td>
<td></td>
<td></td>
<td>6.01</td>
<td>1.035</td>
<td>2630</td>
</tr>
<tr>
<td><strong>Future Planning</strong></td>
<td>.914</td>
<td>4</td>
<td>5.88</td>
<td>.940</td>
<td>2,630</td>
</tr>
<tr>
<td>While attending DoD STARBASE, the students appear...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>... more excited about their futures.</td>
<td></td>
<td></td>
<td>5.92</td>
<td>1.034</td>
<td>2630</td>
</tr>
<tr>
<td>... more ready to set future educational and career goals.</td>
<td></td>
<td></td>
<td>5.90</td>
<td>1.050</td>
<td>2630</td>
</tr>
<tr>
<td>... more goal oriented.</td>
<td></td>
<td></td>
<td>5.86</td>
<td>1.082</td>
<td>2630</td>
</tr>
<tr>
<td>... to focus more on their future potential.</td>
<td></td>
<td></td>
<td>5.83</td>
<td>1.059</td>
<td>2630</td>
</tr>
</tbody>
</table>
### Appendix G: Mean Ratings by Measurement Area, (cont.)

<table>
<thead>
<tr>
<th>Measurement Area</th>
<th>Cronbach’s Alpha Reliability</th>
<th>Items</th>
<th>2018 Mean</th>
<th>Std. Deviation</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Military and Career</strong></td>
<td>.770</td>
<td>5</td>
<td>5.08</td>
<td>.871</td>
<td>2,630</td>
</tr>
<tr>
<td>While attending DoD STARBASE, the students appear...</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>… more comfortable with military personnel.</td>
<td>5.78</td>
<td>1.190</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>… to have more questions about DoD and other non-military career opportunities.</td>
<td>5.66</td>
<td>1.195</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>… more interested in learning about military careers.</td>
<td>5.66</td>
<td>1.180</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The students enjoyed being on a military base.</td>
<td>6.68</td>
<td>0.770</td>
<td>2461</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Because of my participation in DoD STARBASE, I am more comfortable with military personnel.</td>
<td>5.28</td>
<td>1.443</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Program Support</strong></td>
<td>.716</td>
<td>7</td>
<td>6.18</td>
<td>.726</td>
<td>2,630</td>
</tr>
<tr>
<td>My school plans to participate in the DoD STARBASE program again next year.</td>
<td>6.90</td>
<td>0.544</td>
<td>2118</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I look forward to bringing future classes to the DoD STARBASE program.</td>
<td>6.78</td>
<td>0.683</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents are delighted that their children are participating in DoD STARBASE.</td>
<td>6.39</td>
<td>0.973</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I would like more DoD STARBASE supplemental resources to take back to my classroom.</td>
<td>6.39</td>
<td>1.075</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>My principal is a strong advocate of DoD STARBASE.</td>
<td>6.08</td>
<td>1.309</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I plan to incorporate DoD STARBASE teaching techniques into my daily classroom activities.</td>
<td>6.26</td>
<td>1.035</td>
<td>2630</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I prefer the supplemental resources DoD STARBASE provides to teachers over other similar resources.</td>
<td>5.81</td>
<td>1.293</td>
<td>2131</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Post-Program Impact</strong></td>
<td>.893</td>
<td>10</td>
<td>6.18</td>
<td>.726</td>
<td>1558</td>
</tr>
<tr>
<td>The students talk about DoD STARBASE long after the program has ended.</td>
<td>6.56</td>
<td>0.785</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending DoD STARBASE helps students better understand how STEM skills/abilities fit job requirements for certain career fields.</td>
<td>6.42</td>
<td>0.798</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending DoD STARBASE helps students better understand that developing their current skills/abilities is necessary to have good future career choices.</td>
<td>6.41</td>
<td>0.817</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending DoD STARBASE helps students link their experience to careers in both military and non-military positions.</td>
<td>6.12</td>
<td>1.025</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After DoD STARBASE, students are more interested in using computers for class-related learning activities.</td>
<td>6.01</td>
<td>1.590</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DoD STARBASE helped to improve cooperative learning in the classroom even after the program ended.</td>
<td>6.18</td>
<td>0.952</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After the DoD STARBASE program, the students ask more questions about technology.</td>
<td>6.00</td>
<td>1.025</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students who have attended DoD STARBASE seem to perform better on standardized state assessments.</td>
<td>4.42</td>
<td>2.627</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After DoD STARBASE attendance, there is increased participation in the Science Fair and other STEM-related challenge programs (e.g., FIRST LEGO League, Odyssey of the Mind, Team America Rocket Competition, etc.).</td>
<td>4.36</td>
<td>2.619</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After DoD STARBASE, students have better school attendance.</td>
<td>4.41</td>
<td>2.193</td>
<td>1558</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
“My experience AT DoD STARBASE was incredible, because I learned a lot of things that I didn’t know. These past weeks have been the best in my life, and I can’t be more grateful. The activities were very fun, my favorite one was Geocache. Thanks to this program I know what I want to become when adult. Also, now I think I can achieve all of my goals.”

- STUDENT AT DR. ANTONIO PEDREIRA SCHOOL, ATTENDING STARBASE PUERTO RICO
Glossary

**Academy**: See DoD STARBASE Academy.

**American Indian or Alaskan Native**: A person having origins in any of the original peoples of North and South America (including Central America) who maintains cultural identification through tribal affiliation or community attachment.

**Appropriations**: An act of Congress that permits Federal agencies to incur obligations and to make payments out of the Treasury for specified purposes. An appropriations act is the most common means of providing budget authority.

**Asian**: A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian Subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.

**At-Risk**: Being “at-risk” means having one or more family background, or other factors, that have been found to predict a high rate of school failure at some time in the future. This “failure” generally refers to dropping out of high school before graduation, but also can mean being retained within a grade from one year to the next. The risk factors include having a mother whose education is less than high school, living in a single-parent family, receiving welfare assistance, and living in a household where the primary language spoken is other than English.

**At-Risk Youth**: Students at risk are those who have characteristics that increase their chances of dropping out or falling behind in school. These characteristics may include being from a single-parent household, having an older sibling who dropped out of high school, changing schools two or more times other than the normal progression (e.g., from elementary to middle school), having C’s or lower grades, being from a low socio-economic status family, or repeating an earlier grade.

**Black or African American**: A person having origins in any of the black racial groups of Africa.

**Class**: Within the context of a DoD STARBASE Academy, a class is a grouping of students. This group may not necessarily have been a homogenous entity prior to DoD STARBASE instruction; it may be a temporary grouping only for the purposes of assembling for the 25-hour minimum period of DoD STARBASE instruction.

**Classroom Contact Hour**: A period of 60 minutes, plus or minus 5 minutes, in which a DoD STARBASE Academy instructor is actively involved with students or in which a military member is demonstrating, displaying, or teaching an application of math, science, or technology to the students.

**Classroom Teacher**: Teacher from schools who participate in DoD STARBASE classes.

**Computer-Aided Design (CAD)**: The use of computer systems to assist in the creation, modification, analysis, or optimization of a design. It is both a visual and symbol-based method of communication whose conventions are particular to a specific technical field.

**Conferences**: DoD STARBASE holds two conferences a year to provide professional development to the DoD STARBASE directors and instructors.

**Core Curriculum**: The fixed course of study taught by all DoD STARBASE academies. (See DoD STARBASE Curriculum.)

**Current Expenditures**: Expenditures for operating DoD STARBASE Academies, excluding capital outlay. These expenditures include such items as salaries for personnel, facilities, travel, supplies, equipment, contract service and outreach.

**Current Expenditures per Pupil**: Current expenditures for the DoD STARBASE academies divided by the total number of participating students.

**Director**: DoD STARBASE staff member responsible for the DoD STARBASE academy.
Disability: Any of the disabilities classified in the U.S. Department of Education’s Office of Special Education Programs (OSEP), which collects information on students with disabilities as part of the implementation of the Individuals with Disabilities Education Act (IDEA). Categories of disabilities include autism, deaf-blindness, developmental delay, emotional disturbance, hearing impairment, intellectual disability, multiple disabilities, orthopedic impairment, other health impairment, specific learning disabilities, speech or language impairments, traumatic brain injury, visual impairments, and preschool disability.

DoD: Department of Defense.

DoD Components: DoD entities that have established or are in pursuit of establishing a DoD STARBASE academy, including the military departments, defense agencies, and defense field activities.

DoD Instruction (DoDI): Document that implements policies, responsibilities, and procedures for executing the DoD STARBASE program.

DoD STARBASE Academy: A DoD educational program designed to improve the knowledge and skills of students in kindergarten through twelfth grade in mathematics, science, and technology. It follows the academy model description in DoDI 1025.7.

DoD STARBASE Curriculum: DoD STARBASE core curriculum is comprised of the following areas:

Physics and Chemistry
   A. Motion and Force
   B. Fluid Mechanics
   C. Building Blocks of Matter

Energy
   A. Energy Fundamentals

Technology
   A. Current and Emerging Technologies
   B. Applying Technology

Engineering
   A. Engineering Design Process (EDP)
   B. 3-D Computer-Aided Design

Mathematics Operations and Applications
   A. Numbers and Number Relationships
   B. Measurement
   C. Geometry
   D. Data Analysis

Science, Technology, Engineering and Mathematics (STEM) Careers
   A. STEM Careers on Military Facilities
   B. Personal Investigations
Glossary, cont.

DoD STARBASE Program: The DoD STARBASE program is authorized by Title 10 United State Code Section 2193b as a DoD science, math, and technology education improvement program. The OASD/M&RA administers policy and oversight; the DoD components execute the program at DoD STARBASE academies. DoD STARBASE is funded by Congress as a Civil Military Program.

DoD STARBASE Site/Location: The location of a DoD STARBASE Academy where the program is taught.

DoE: Department of Education.

Driver: Drivers identify a set of related attitudinal clusters for the student population (i.e. when the driver is present, the set of attitudes will most likely be present, or in reverse, when the condition in the list of attitudes are present the target “driver” attitude will also be present).

Elementary School: A school with one or more of grades K–6 that does not have any grade higher than grade 8. For example, schools with grades K–6, 1–3, or 6–8 are classified as elementary.

Elementary/Secondary School: Elementary/secondary schools include regular schools (i.e., schools that are part of state and local school systems and private elementary/secondary schools, both religiously affiliated and nonsectarian), alternative schools, vocational education schools, and special education schools.

Enrollment: The total number of students registered at a DoD STARBASE Academy at a given time.

Ethnicity/Race: Categories developed in 1997 by the Office of Management and Budget (OMB) that are used to describe groups to which individuals belong, identify with, or belong in the eyes of the community. The categories do not denote scientific definitions of anthropological origins. The designations are used to categorize U.S. citizens, resident aliens, and other eligible non-citizens. Individuals are asked to first designate ethnicity as: Hispanic or Latino or Not Hispanic or Latino. Second, individuals are asked to indicate one or more races that apply among the following: American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White.

Expenditures: Charges incurred, whether paid or unpaid.

Expenditures Per Pupil: Charges incurred for a particular period of time divided by a student unit of measure, such as enrollment, average daily attendance, or average daily membership.

Fiscal Year: The yearly accounting period for the federal government, which begins on October 1 and ends on the following September 30. The fiscal year is designated by the calendar year in which it ends; for example, fiscal year 2014 begins on October 1, 2013 and ends on September 30, 2014.

Free or Reduced-Price Lunch: See National School Lunch Program.

Gap Score: Difference between pre-program and post-program test scores.

Graduate: An individual who has received formal recognition for the successful completion of a prescribed program of studies.

High School: A secondary school offering the final years of high school study necessary for graduation, in which the lowest grade is not lower than grade 9 and usually includes grades 10, 11, and 12 or grades 9, 10, 11, and 12. Alternatively, according to the 2007–08 Schools and Staffing Survey, defined as a school with no grade lower than 7 and at least one grade higher than 8.

Hispanic or Latino: A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

Inner City Location: Usually older, poorer, and more densely populated central section of a city.
Glossary, cont.

Inquiry-Based Learning: A student-centered educational approach which focuses on using and learning content as a means to develop information-processing and problem-solving skills. In this approach the teacher acts as a facilitator. Students are involved in the building of knowledge through active involvement.

Instructor: DoD STARBASE educator.

Kindergarten: Includes transitional kindergarten, kindergarten, and pre-1st grade students.

Location: See DoD STARBASE Site/Location.

Mapping: The process of using maps to chart a course.

Mathematics: The study of the measurement, properties, and relationships of quantities and sets, using numbers and symbols. A body of related courses concerned with knowledge of measurement, properties, and relations quantities, which can include theoretical or applied studies of arithmetic, algebra, geometry, trigonometry, statistics, and calculus.

Median: A number that half of the data is larger than it and half is smaller. If the itemized data are listed in order of size, the median is the middle number in the list.

Middle school: A school with no grade lower than 5 and no grade higher than 8.

Minority: Racial and ethnic minority populations are defined as: Asian American, Black or African American, Hispanic or Latino, Native Hawaiian and Other Pacific Islander, American Indian and Alaskan Native.

Nanotechnology: The science of manipulating materials on an atomic or molecular scale especially to build microscopic devices.

National School Lunch Program: Established by President Truman in 1946, the program is a federally assisted meal program operated in public and private nonprofit schools and residential child care centers. To be eligible for free lunch, a student must be from a household with an income at or below 130 percent of the federal poverty guideline; to be eligible for reduced-price lunch, a student must be from a household with an income between 130 percent and 185 percent of the federal poverty guideline.

Native American: See American Indian or Alaskan Native.

Native Hawaiian or Other Pacific Islander: A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

Navigation: The theory, practice and technology of charting a course for a ship, aircraft or a spaceship.

Not-For-Profit Organization: A legal entity recognized or chartered by competent state authority and to which the Internal Revenue Service has given status as a 501(c) 3 tax-exempt educational organization.

OASD/M&RA: Office of the Assistant Secretary of Defense for Manpower and Reserve Affairs.

Operational Academies: An academy that is processing students.

Participant: A DoD STARBASE student. Participant also refers to military command support units, the local sponsoring base command, community leaders, local community sponsoring committees, school systems, schools, teachers, military service volunteers, DoD STARBASE Board members, staff, and parents.

Percentile (Score): A value on a scale of 0 to 100 that indicates the percent of a distribution that is equal to or below it.

Pre/Post Application: Prior to the start of the program and at the completion of the program.

Program Year: The DoD STARBASE program year is the same as the government fiscal year, October 1 – September 30.
Glossary, cont.

**Public School:** A school that provides educational services for at least one of grades K–12 (or comparable ungraded levels), has one or more teachers to give instruction, has an assigned administrator, receives public funds as primary support, and is operated by an education or chartering agency. Public schools include regular, special education, vocational/technical, alternative, and charter schools. They also include schools in juvenile detention centers, schools located on military bases and operated by the Department of Defense, and Bureau of Indian Education-funded schools operated by local public school districts. See also Special education school, Vocational school, Alternative school, Charter school, and Traditional public school.

**Race/Ethnicity:** Categories developed in 1997 by the Office of Management and Budget (OMB) that are used to describe groups to which individuals belong, identify with, or belong in the eyes of the community. The categories do not denote scientific definitions of anthropological origins. The designations are used to categorize U.S. citizens, resident aliens, and other eligible non-citizens. Individuals are asked to first designate ethnicity as: Hispanic or Latino or Not Hispanic or Latino. Second, individuals are asked to indicate one or more races that apply among the following: American Indian or Alaskan Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, White.

**Race/Ethnicity Unknown:** The category used to report students or employees whose race and ethnicity are not known.

**Rural Location:** All population, housing and territory not included within an urbanized area. Whatever is not urban is considered rural.

**Salary:** The total amount regularly paid or stipulated to be paid to an individual, before deductions, for personal services rendered while on the payroll of a business or organization.

**Sample Population:** A statistically significant representation of the total number of students tested each year.

**School District:** An education agency at the local level that exists primarily to operate public schools or to contract for public school services.

**Science:** The body of related course concerned with knowledge of the physical and biological world and with the processes of discovering and validating this knowledge.

**Secondary School:** A school with one or more of grades 7–12 that does not have any grade lower than grade 7. For example, schools with grades 9–12, 7–9, 10–12, or 7–8 are classified as secondary.

**Site:** See DoD STARBASE Site/Location.

**Socio-Economic Disadvantage:** A term used to describe economically deprived, poor, poverty stricken, or disadvantaged individuals or groups. (See also Socio-economic status.)

**Socio-Economic Status:** A measure of an individual or family's relative economic and social ranking based on such factors as father's education level, mother's education level, father's occupation, mother's occupation, and family income.

**STEM:** Science, Technology, Engineering, and Mathematics (STEM) fields of study that are considered to be of particular relevance to advanced societies.

**Supplemental Programs:** These are programs that for one reason or another (e.g. below minimum hours, do not cover the core curriculum areas, etc.) do not meet DoDI standards. They are more diverse than traditional DoD STARBASE programs, are often conducted during the summer months and may be designed to reach students that do not fall under the targeted “participant” schools or are in response to requests by members of the community to serve other groups of children. Supplemental programs are not required and are beyond the normal operation and obligations of the academy. In many cases, supplemental programs are established in response to the demand created by the popularity and success of the DoD STARBASE program within the community.
**Teacher Certification:** License granted by states for teachers to teach a given subject. These vary by state, but generally include: Obtaining a bachelor’s degree; Completing a teacher preparation program, which includes either an undergraduate, master’s, or alternative program; Getting state or national certification to teach by completing all requirements.

**Title I Grant Program:** The federal government provides grants to local education agencies to supplement state and local education funding based primarily on the number of children from low-income families in each local education agency. The program provides extra academic support and learning opportunities to help disadvantaged students catch up with their classmates or make significant academic progress.

**Urban Area (UA):** Consists of 50,000 or more people.

**Urban Cluster (UC):** Consists of at least 2,500 and less than 50,000 people.

**White:** A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

“*The DoD STARBASE program is a very important one for the Georgia National Guard, it allows us to explain our mission and demonstrate our capabilities to a whole class of Georgia citizens, that we would otherwise have no access to.*”

-CW4 KEN DYSON, PEACH STATE STARBASE
DoD STARBASE Directory

**ALABAMA**

**MONTGOMERY**

**STARBASE Maxwell***
Service Component: Air Force
Military Location: Maxwell Air Force Base
Address: 60 W. Maxwell Boulevard, Building 835
Montgomery, Alabama 36116
Tel: 334-953-4072
Director: Ann Sikes
Email: starbasemaxwell@montgomeryed.org
Website: http://www.starbasemaxwell.org

**AUTAUGA COUNTY**

AUTAUGAVILLE
DANIEL PRATT ELEMENTARY
PINE LEVEL ELEMENTARY
PRATTVILLE INTERMEDIATE

**DEPARTMENT OF DEFENSE SCHOOL**

MAXWELL ELEMENTARY

**ELMORE COUNTY**

BILLINGSLEY
HOLTVILLE MIDDLE
MILLBROOK MIDDLE

**MONTGOMERY COUNTY**

CATOMA EKENEBTART
CRUMP ELEMENTARY
DANNELLY ELEMENTARY
DOZIER ELEMENTARY
DUMBAR RAMER
FLOWERS ELEMENTARY
HIGHLAND AVENUE ELEMENTARY
SOUTHLAWN ELEMENTARY
T.S. MORRIS ELEMENTARY
VAUGHN ROAD ELEMENTARY
WARES FERRY ELEMENTARY
WILSON ELEMENTARY

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**ARIZONA**

**TUCSON**

**STARBASE Arizona**
Service Component: Air Force
Military Location: Davis-Monthan Air Force Base
Address: 5355 E. Granite Street
Tucson, Arizona 85707
Tel: 520-228-7827
Director: Mikelle Cronk
Email: cronkm@vail.k12.az.us
Website: www.facebook.com/starbasearizona

**AMPHITHEATER UNIFIED SCHOOL DISTRICT**

KEELING ELEMENTARY
WALKER ELEMENTARY

**SUNNYSIDE UNIFIED SCHOOL DISTRICT**

ELVIRA ELEMENTARY
MISSION MANOR ELEMENTARY

**VAIL UNIFIED SCHOOL DISTRICT**

ACACIA ELEMENTARY
DESERT WILLOW ELEMENTARY
ESMOND STATION K-8

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**CALIFORNIA**

**EDWARDS**

**STARBASE EDWARDS**
Service Component: Air Force
Military Location: Edwards Air Force Base
Address: 1596 Baily Ave
Tel: 661-277-6223
Director: Yvette C. Bivins
Email: Yvette.bivins@us.af.mil
Website: TBD

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*Indicates location also coordinates a DoD STARBASE 2.0 Program.*
**LOS ALAMITOS**

**STARBASE Los Alamitos***
Service Component: National Guard
Military Location: Joint Forces Training Base Los Alamitos
Address: 11525 Freedom Way
Building 262
Los Alamitos, California 90720
Tel: 562-795-1473
Director: Stacey Hendrickson
Email: starbaselosalamitos@gmail.com
Website: https://starbasecomputerla.wixsite.com/starbaselosal

**CYPRESS UNIFIED**
A.E. ARNOLD ELEMENTARY
FRANK VESSELS ELEMENTARY
MORRIS ELEMENTARY
STEVE LUTHER ELEMENTARY

**FULLERTON SCHOOL DISTRICT**
COMMONWEALTH ELEMENTARY
RAYMOND ELEMENTARY

**LONG BEACH UNIFIED**
HOLMES ELEMENTARY

**LOS ANGELES UNIFIED**
92RD STREET ELEMENTARY
93RD STREET ELEMENTARY
96TH STREET ELEMENTARY
109TH STREET ELEMENTARY
112TH STREET ELEMENTARY
116TH STREET ELEMENTARY
118TH STREET ELEMENTARY
122ND STREET ELEMENTARY
BARRETT ELEMENTARY
COMPTON AVENUE ELEMENTARY
FLORENCE GRiffith JOYNER ELEMENTARY
GRAPE STREET ELEMENTARY
HELIOTROPE AVENUE ELEMENTARY
LOVELIA FLOURNOY ELEMENTARY
RITTER ELEMENTARY
RUSSELL ELEMENTARY
WIEGAND ELEMENTARY

**OCEAN VIEW UNIFIED**
CIRCLEVIEW ELEMENTARY
COLLEGE VIEW ELEMENTARY

**PRIVATE SCHOOL**
DOLORES MISSION
ST. MICHAELS

**SANTA ANA UNIFIED**
DAVIS ELEMENTARY
DIAMOND ELEMENTARY
EL SOL
JIM THORPE ELEMENTARY
JOHN F. KENNEDY ELEMENTARY
MADISON ELEMENTARY
PIO PICO ELEMENTARY

**SACRAMENTO**

**STARBASE Sacramento**
Service Component: National Guard
Military Location: Okinawa California National Guard Armory
Address: 8400 Okinawa Street
Sacramento, California 95828
Tel: 916-387-7405
Director: Major Sarah Earlene Hudson
Email: sarah.e.hudson.mil@mail.mil
Website: Pending

**AMADOR COUNTY UNIFIED**
PLYMOUTH ELEMENTARY
SUTTER CREEK ELEMENTARY

**ELK GROVE UNIFIED**
ARLENE HEIN ELEMENTARY
BARBARA COMSTOCK ELEMENTARY
ELLIOTT RANCH ELEMENTARY
FLORENCE MARKOFER ELEMENTARY
FOULKS RANCH ELEMENTARY
JOHN EHRHART ELEMENTARY
JOSEPH SIMS ELEMENTARY
MARION MIX ELEMENTARY
MARY TSUKAMOTO ELEMENTARY
PRAIRIE ELEMENTARY
ROBERT J. MCGARVEY ELEMENTARY
ROY HERBURGER ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
COLORADO

COLORADO SPRINGS

STARBASE Peterson*
Service Component: Air Force
Military Location: Peterson Air Force Base
Address: 710 Loring Street
Building 850
Colorado Springs, Colorado 80914
Tel: 719-556-9500
Director: Patty Smathers
Email: psstarbasepeterson@gmail.com
Website: None

COLORADO SPRINGS SCHOOL DISTRICT ELEVEN
ADAMS ELEMENTARY
COLUMBIA ELEMENTARY
EDISON ELEMENTARY
GLOBE CHARTER
JACKSON ELEMENTARY
JAMES MONROE ELEMENTARY
MADISON ELEMENTARY
MIDLAND INTERNATIONAL
QUEEN PALMER ELEMENTARY
ROOSEVELT CHARTER
SCOTT ELEMENTARY
TWAIN ELEMENTARY
WEST ELEMENTARY

WILL ROGERS ELEMENTARY
WILSON ELEMENTARY

ELLICOT SCHOOL DISTRICT 22
ELLICOTT ELEMENTARY

FALCON SCHOOL DISTRICT 49
IMAGINE CLASSICAL
ODYSSEY

HARRISON SCHOOL DISTRICT TWO
MONTEREY ELEMENTARY
MOUNTAIN VISTA
WILDFLOWER ELEMENTARY

PRIVATE
COLORADO SPRINGS CHRISTIAN
DIVINE REDEEMER
PIKES PEAK CHRISTIAN

STATE CHARTER SCHOOL INSTITUTE
COLORADO MILITARY ACADEMY

CONNECTICUT

HARTFORD

STARBASE Connecticut - Windsor Locks*
Service Component: National Guard
Military Location: Bradley Air National Guard Base, Windsor Locks Readiness Center
Address: 85 Light Lane, Unit 300
Windsor Locks, Connecticut 06096
Tel: 860-292-4678
Director: Melissa Vanek
Email: starbasehartford@gmail.com
Website: www.starbase-ct.com

CAPITAL REGION EDUCATION COUNCIL
CREC MUSEUM ACADEMY
INTERNATIONAL MAGNET SCHOOL OF GLOBAL STUDIES

HARFORD PUBLIC SCHOOL
CAPITAL PREPARATORY MAGNET
DR. FRANK D. FOX
MARIA COLON SANCHEZ ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
MIDDLE GRADES ACADEMY AT WEST MIDDLE
RAMON E. BETANCES STEM MAGNET
RAWSON STEAM SCHOOL
WEBSTER MICROSOCIETY MAGNET

PRIVATE
JUMOKE ACADEMY HONORS SMART

WINDSOR LOCKS SCHOOL DISTRICT
SOUTH ELEMENTARY

WINDSOR PAROCHIAL SCHOOLS
ST. GABRIEL

WATERBURY
STARBASE Connecticut - Waterbury
Service Component: National Guard
Military Location: Off-base
Address: 750 Chase Parkway
Waterbury, Connecticut 06708
Tel: 203-575-8271
Director: Melissa Vanek
Email: starbasewb@gmail.com
Website: www.starbase-ct.com

WATERBURY PAROCHIAL SCHOOLS
OUR LADY OF MOUNT CARMEL ELEMENTARY

WATERBURY PRIVATE SCHOOL
CHILDREN’S COMMUNITY SCHOOL

WATERBURY PUBLIC SCHOOLS
BUCKS HILL ELEMENTARY
BUNKER HILL ELEMENTARY
B.W. TINKER ELEMENTARY
CARRINGTON ELEMENTARY
CHASE ELEMENTARY
DRIGGS ELEMENTARY
DUGGAN ELEMENTARY
F.J. KINGSBURY ELEMENTARY
GENERALI ELEMENTARY
HOPEVILLE ELEMENTARY
JOHN G. GILMARTIN ELEMENTARY
JONATHAN REED ELEMENTARY

MALONEY MAGNET ELEMENTARY
REGAN ELEMENTARY
ROTELLA ELEMENTARY
SPRAGUE ELEMENTARY
WALSH ELEMENTARY
WASHINGTON ELEMENTARY
WENDELL CROSS ELEMENTARY
WOODROW WILSON ELEMENTARY

FLORIDA

JACKSONVILLE

STARBASE Florida
Service Component: National Guard
Military Location: 125th Fighter Wing FANG
Address: 14300 FANG Drive
Jacksonville, Florida 32218
Tel: 904-741-7320
Director: Bruce A. Griner Jr.
Email: karen.m.strandberg.nfg@mail.mil
Website: None

DUVAL COUNTY PUBLIC SCHOOLS
DINSMORE ELEMENTARY CENTER ACADEMY
GARDEN CITY
LONE STAR ELEMENTARY
MAMIE AGNES JONES ELEMENTARY
OCEANWAY ELEMENTARY
PICKETT ELEMENTARY
PINEDALE ELEMENTARY
R.V. DANIELS ELEMENTARY
SACRED HEART CATHOLIC
SONSHINE CHRISTIAN ACADEMY
WINDRY HILL

ST. AUGUSTINE DIOCESE
GUARDIAN CATHOLIC
HOLY FAMILY
SAN JOSE CATHOLIC

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
GEORGIA

MARIETTA
Peach State STARBASE
Service Component: National Guard
Military Location: Clay National Guard Center/
  Dobbins Air Reserve Base
Address: 1000 Halsey Avenue, Building 53
Dobbins ARB, Georgia 30060
Tel: 678-569-3568
Director: John McKay
Email: john.e.mckay8.nfg@mail.mil
Website: www.facebook.com/peachstatestarbase

COBB COUNTY SCHOOL DISTRICT
ARGYLE ELEMENTARY
HARMONY LELAND ELEMENTARY
LABELLE ELEMENTARY
MABLETON ELEMENTARY
TRITT ELEMENTARY

HOMESCHOOL GROUP
FORSYTH COUNTY CHRISTIAN HOMESCHOOL GROUP

MARIETTA CITY SCHOOLS
DUNLEITH ELEMENTARY
LOCKHEED ELEMENTARY

PRIVATE
CUMBERLAND CHRISTIAN ACADEMY

SAVANNAH
STARBASE Savannah*
Service Component: Army
Military Location: Hunter Army Air Field
Address: 134 MacArthur Circle
Building 617
Savannah, Georgia 31409
Tel: 912-315-3749
Director: Betty L. G. Morgan
Email: Betty.L.Morgan8.ctr@mail.mil
Website: savannahstarbase.weebly.com/index.html

*Indicates location also coordinates a DoD STARBASE 2.0 Program.

CHATHAM COUNTY
BLOOMINGDALE ELEMENTARY
CALVARY DAY
GEORGETOWN K - 8
HUBERT MIDDLE
JACOB G. SMITH
METTER INTERMEDIATE
OTIS J. BROCK III ELEMENTARY
PULASKI ELEMENTARY
VIRGINIA HEARD

PRIVATE
ST. ANDREWS

WARNER ROBINS
STARBASE Robins*
Service Component: Air Force Reserve
Military Location: Robins Air Force Base
Address: 1942 Heritage Boulevard
Warner Robins, Georgia 31098
Tel: 478-926-1769
Director: Wesley Fondal, Jr.
Email: wesley@starbaserobins.org
Website: www.starbaserobins.org

BIBB SCHOOL DISTRICT
ALEXANDER II ELEMENTARY
BERND ELEMENTARY
BROOKDALE ELEMENTARY
BRUCE ELEMENTARY
HARTLEY ELEMENTARY
HEARD ELEMENTARY
PORTER ELEMENTARY
SPRINGDALE ELEMENTARY
UNION ELEMENTARY
VINEVILLE ACADEMY OF THE ARTS
WESTSIDE ELEMENTARY

DOOLY COUNTY
DOOLY COUNTY ELEMENTARY

HOUSTON SCHOOL DISTRICT
BONAIRE ELEMENTARY
EAGLE SPRINGS ELEMENTARY
LAKE JOY ELEMENTARY
LINDSEY ELEMENTARY

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HAWAII

KEAAU

STARBASE Hawaii
Service Component: National Guard
Military Location: Keaau Armory
Address: 16-512 Volcano Highway
Keaau, Hawaii 96749
Tel: 808-982-4298
Director: Diana Kelley (Acting Director)
Email: diana.e.kelley@hawaii.gov
Website: None

HILO PUBLIC
WAIAKEA ELEMENTARY

KAU-KEAAU-PAHOA COMPLEX
KEAAU ELEMENTARY
MT. VIEW ELEMENTARY
NA WAI OLA PUBLIC CHARTER
VOLCANO SCHOOL OF ARTS AND SCIENCES PUBLIC CHARTER

PRIVATE
HAI LI CHRISTIAN
ST. JOSEPH

IDAHO

BOISE

STARBASE Idaho
Service Component: Air National Guard
Military Location:
Address: 4040 W. Guard Street
Boise, Idaho 83705
Tel: 208-258-6534
Director: Jim Heuring
Email: starbasemedia@imd.idaho.gov
Website: TBD

KUNA
CRIMSON POINT

WEST ADA
SUMMERWING ACADEMY

INDIANA

FORT WAYNE

STARBASE Indiana - Fort Wayne*
Service Component: National Guard
Military Location: 122 Fighter Wing
Address: 3005 W. Ferguson Road
Fort Wayne, Indiana 46809
Tel: 260-478-3712
Director: Evan Smith
Email: Evan@starbasein.org
Website: www.starbasein.org

EAST ALLEN COUNTY SCHOOLS
HERITAGE ELEMENTARY
NEW HAVEN INTERMEDIATE
PRINCE CHAPMAN ACADEMY

FORT WAYNE COMMUNITY SCHOOLS
BLOOMINGDALE ELEMENTARY
FRANKE PARK ELEMENTARY
GLENWOOD PARK ELEMENTARY
INDIAN VILLAGE ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
LEVAN SCOTT ACADEMY
MAPLEWOOD ELEMENTARY
SOUTH WAYNE ELEMENTARY
WASHINGTON ELEMENTARY
WEISSER PARK ELEMENTARY

HUNTINGTON COUNTY SCHOOLS
FLINT SPRINGS

PRIVATE
CENTRAL CHRISTIAN
CORNERSTONE CHRISTIAN
DIVINE MERCY
EMMAUS LUTHERAN
MOST PRECIOUS BLOOD
ST. PAUL’S LUTHERAN
SUBURBAN BETHLEHEM LUTHERAN
ST. ALOYSIUS
ST. JOHN THE BAPTIST
ST. JOSEPH
ST. JOSEPH HESSEN CASSEL
ST. ELIZABETH ANN SETON
ST. THERESE

GARY

STARBASE Indiana-Gary
Service Component: Indiana Army National Guard
Military Location: Gary Armory
Address: 2501 E. 15th Ave
Gary, Indiana 46402
Tel: 317-247-3300
Director: Ava R. Marshall-Ligon
Email: ava@Starbasein.org

HUNTINGTON COUNTY SCHOOLS
FLINT SPRINGS

PRIVATE
CENTRAL CHRISTIAN
CORNERSTONE CHRISTIAN
DIVINE MERCY
EMMAUS LUTHERAN
MOST PRECIOUS BLOOD
ST. PAUL’S LUTHERAN
SUBURBAN BETHLEHEM LUTHERAN
ST. ALOYSIUS
ST. JOHN THE BAPTIST
ST. JOSEPH
ST. JOSEPH HESSEN CASSEL
ST. ELIZABETH ANN SETON
ST. THERESE

INLAND BAY

TIMBER RIDGE ELEMENTARY
MILITARY SITE

PRIVATE
CENTRAL CHRISTIAN
CORNERSTONE CHRISTIAN
DIVINE MERCY
EMMAUS LUTHERAN
MOST PRECIOUS BLOOD
ST. PAUL’S LUTHERAN
SUBURBAN BETHLEHEM LUTHERAN
ST. ALOYSIUS
ST. JOHN THE BAPTIST
ST. JOSEPH
ST. JOSEPH HESSEN CASSEL
ST. ELIZABETH ANN SETON
ST. THERESE

INLAND BAY

FIRST BAPTIST CHURCH OF HAMMOND
HAMMOND BAPTIST

NATIONAL HERITAGE ACADEMIES
ASPIRE CHARTER ACADEMY

SCHOOL CITY OF EAST CHICAGO
BENJAMIN HARRISON ELEMENTARY
WILLIAM MCKINLEY ELEMENTARY

INDIANAPOLIS

STARBASE Indiana-Indianapolis
Service Component: National Guard
Military Location: Joint Forces Headquarters, Indiana National Guard
Address: 2002 S. Holt Road, Building 15
Indianapolis, Indiana 46241
Tel: 317-247-3503
Director: Brande Morgan
Email: indyinfo@starbasein.org
Website: www.starbasein.org

EMINENCE COMMUNITY SCHOOL
EMINENCE ELEMENTARY

FRANKLIN TOWNSHIP COMMUNITY SCHOOL CORPORATION
ARLINGTON ELEMENTARY
THOMPSON CROSSING ELEMENTARY
GREENWOOD COMMUNITY SCHOOL CORPORATION
WESTWOOD ELEMENTARY
INDIANAPOLIS MATH & SCIENCE ACADEMY - NORTH
IN MATH & SCIENCE ACADEMY - NORTH

INDIANAPOLIS PUBLIC SCHOOLS
CENTER FOR INQUIRY #2
CENTER FOR INQUIRY #27
FREDRICK DOUGLAS SCHOOL #19
MERLE SIDENER GIFTED ACADEMY
ROBERT LEE FROST ELEMENTARY #106
THOMAS GREGG NEIGHBORHOOD SCHOOL #15

METROPOLITAN SCHOOL DISTRICT OF
WASHINGTON TOWNSHIP
ALLISONVILLE ELEMENTARY
CROOKED CREEK ELEMENTARY

PRIVATE
GREENWOOD CHRISTIAN ACADEMY
ST. FRANCIS

HOMESCHOOL
HOMESCHOOL CLASS

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
SOUTH BEND

STARBASE Indiana-South Bend*
Service Component: National Guard
Military Location: South Bend Armory
Address: 1901 Kemble Avenue
South Bend, Indiana 46613
Tel: 317-247-3000, Extension 88827
Director: Matt Bellina
Email: matt@starbasein.org
Website: www.starbasein.org

DIOCESE OF FORT WAYNE – SOUTH BEND
MISHAWAKA CATHOLIC
ST. ANTHONY DE PAUDA CATHOLIC
ST. ADALBERT CATHOLIC
ST. JOHN THE BAPTIST CATHOLIC
ST. MATTHEW CATHEDRAL
ST. MICHAEL CATHOLIC

PRIVATE
COVENANT CHRISTIAN
RESURRECTION LUTHERAN ACADEMY

SCHOOL CITY OF MISHAWAKA
LASALLE ELEMENTARY
TWIN BRANCH ELEMENTARY
SOUTH BEND COMMUNITY SCHOOL CORPORATION
BROWN INTERMEDIATE CENTER
CLAY INTERMEDIATE CENTER
EDISON INTERMEDIATE CENTER
JEFFERSON INTERMEDIATE CENTER
MARSHAL INTERMEDIATE CENTER
NAVARRE INTERMEDIATE CENTER

KANSAS

KANSAS CITY

STARBASE Kansas City*
Service Component: National Guard
Military Location: Olathe Armory
Address: 1601 W. Old HWY 56
Olathe, Kansas 66061-5175
Tel: 785-646-7864
Director: Karen Whitacre
Email: kansascity@kansasstarbase.org
Website: www.kansasstarbase.org

BASEHOR LINWOOD SCHOOL DISTRICT
BASEHOR ELEMENTARY
GLENWOOD RIDGE ELEMENTARY
LINWOOD ELEMENTARY

EASTON UNIFIED SCHOOL DISTRICT
PLEASANT RIDGE ELEMENTARY

KANSAS CITY KANSAS PUBLIC SCHOOLS
LINDBERGH ELEMENTARY
STONY POINT NORTH ELEMENTARY
STONY POINT SOUTH ELEMENTARY
WHITE CHURCH ELEMENTARY

LAWRENCE PUBLIC SCHOOLS
PINCKNEY ELEMENTARY

LEAVENWORTH UNIFIED SCHOOL DISTRICT
DAVID BREWER ELEMENTARY
HENRY LEAVENWORTH ELEMENTARY

PRIVATE
KANSAS CITY CHRISTIAN
ST. AGNES CATHOLIC
ST. PATRICK CATHOLIC
XAVIER CATHOLIC

SHAWNEE MISSION SCHOOL DISTRICT
BLUE JACKET FLINT ELEMENTARY
NIEMAN ELEMENTARY
RHEIN BENNINGHOVEN ELEMENTARY
SANTE FE TRAIL ELEMENTARY
TOMAHAWK ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
**MANHATTAN**

**STARBASE Manhattan***
Service Component: National Guard
Military Location: 130th Field Artillery Brigade
Address: 721 Levee Drive
Manhattan, Kansas 66502-5085
Tel: 785-646-4690
Director: Rebecca Catlin
Email: becky@kansasstarbase.org
Website: www.kansasstarbase.org

**BLUE VALLEY-RANDOLPH USD 384**
RANDOLPH BLUE VALLEY MIDDLE

**GEARY COUNTY SCHOOLS UNIFIED SCHOOL DISTRICT 475**
FT. RILEY ELEMENTARY
MILFORD ELEMENTARY
MORRIS HILL ELEMENTARY
SEITZ ELEMENTARY
WESTWOOD ELEMENTARY

**KAW VALLEY UNIFIED SCHOOL DISTRICT 321**
ST. MARYS GRADE SCHOOL

**MANHATTAN-OGDEN UNIFIED SCHOOL DISTRICT 383**
FRANK BERMAN ELEMENTARY
BLUEMONT ELEMENTARY
LEE ELEMENTARY
MARLATT ELEMENTARY
NORTHVIEW ELEMENTARY
OGDEN ELEMENTARY

**SALINA**

**STARBASE Salina***
Service Component: National Guard
Military Location: Great Plains Joint Training Center
Address: 2929 Scanlan Avenue, Building 365
Salina, Kansas 67401
Tel: 785-822-6602
Director: Dixie Tipling
Email: salina@kansasstarbase.org
Website: www.kansasstarbase.org

**CANTON GALVA USD 419**
CANTON - GALVA ELEMENTARY

**CENTRAL PLAINS UNIFIED SCHOOL DISTRICT 112**
WILSON SCHOOL

**CLIFTON - CLYDE UNIFIED SCHOOL DISTRICT 224**
CLIFTON - CLYDE ELEMENTARY

**CONCORDIA PUBLIC SCHOOLS UNIFIED SCHOOL DISTRICT 333**
CONCORDIA MIDDLE SCHOOL

**ELL-SALINE UNIFIED SCHOOL DISTRICT 307**
ELL-SALINE ELEMENTARY

**FLORENCE UNIFIED SCHOOL DISTRICT 408**
MARION ELEMENTARY SCHOOL

**HILLSBORO UNIFIED SCHOOL DISTRICT 410**
HILLSBORO ELEMENTARY SCHOOL

**HOMESCHOOL**
MCPHERSON AREA HOME EDUCATORS

**INMAN UNIFIED SCHOOL DISTRICT 448**
INMAN ELEMENTARY

**LINCOLN UNIFIED SCHOOL DISTRICT 298**
LINCOLN ELEMENTARY

**MCPHERSON UNIFIED SCHOOL DISTRICT 418**
WASHINGTON ELEMENTARY

**MOUNDRIDGE USD 423**
MOUNDRIDGE MIDDLE

**PRIVATE**
ST. MARY CATHOLIC

**SALINA UNIFIED SCHOOL DISTRICT 306**
SOUTHEAST OF SALINA ELEMENTARY

**SALINA UNIFIED SCHOOL DISTRICT 305**
CORONADO ELEMENTARY
GRACE E. STEWART ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.*
HEUSNER ELEMENTARY
MEADOWLARK RIDGE ELEMENTARY
SUNSET ELEMENTARY

SOLOMON UNIFIED SCHOOL DISTRICT 393
SOLOMON ELEMENTARY

SOUTHERN CLOUD UNIFIED SCHOOL DISTRICT 334
MILTONVALE ELEMENTARY
GLASCO GRADE SCHOOL

SYLVAN UNIFIED SCHOOL DISTRICT 299
LUCAS · SYLVAN ELEMENTARY

TWIN VALLEY UNIFIED SCHOOL DISTRICT 240
BENNINGTON GRADE SCHOOL
TESCOTT ELEMENTARY

TOPEKA
STARBASE Topeka*
Service Component: National Guard
Military Location: 190th Air Refueling Wing
Address: 5920 SE Coyote Drive
Forbes Field ANG
Topeka, Kansas 66619
Tel: 785-861-4196
Director: Brent Mumford
Email: brent@kansasstarbase.org
Website: www.kansasstarbase.org

ATCHISON COUNTY COMMUNITY SCHOOLS
UNIFIED SCHOOL DISTRICT 377
ATCHISON COUNTY COMMUNITY ELEMENTARY

AUBURN WASHBURN UNIFIED SCHOOL DISTRICT 437
AUBURN ELEMENTARY
FARLEY ELEMENTARY
WANAMAKER ELEMENTARY

BURLINGAME PUBLIC SCHOOLS
BURLINGAME ELEMENTARY

CENTRAL HEIGHTS
CENTRAL HEIGHTS ELEMENTARY

JEFFERSON WEST UNIFIED SCHOOL DISTRICT 340
JEFFERSON WEST MIDDLE

PERRY-LECOMPTON PUBLIC SCHOOLS
PERRY-LECOMPTON MIDDLE

SANTA FE TRAIL UNIFIED SCHOOL DISTRICT 434
CARBONDALE ATTENDANCE CENTER

SEAMAN UNIFIED SCHOOL DISTRICT 345
LOGAN ELEMENTARY
NORTH FAIRVIEW ELEMENTARY

SHAWNEE HEIGHTS USD 450
TECUMSEH SOUTH ELEMENTARY

TOPEKA PUBLIC SCHOOLS UNIFIED SCHOOL DISTRICT 501
JARDINE ELEMENTARY
MCEACHRON ELEMENTARY
QUINCY ELEMENTARY
SCOTT DUAL MAGNET ELEMENTARY
STOUT ELEMENTARY

WICHITA
STARBASE Wichita
Service Component: National Guard
Military Location: McConnell Air Force Base
Address: 52870 Jayhawk Drive
Wichita, Kansas 67221-9020
Tel: 316-759-8911
Director: Aaron Santry
Email: aaron@kansasstarbase.org
Website: www.kansasstarbase.org

AUGUSTA PUBLIC SCHOOLS
GARFIELD ELEMENTARY
ROBINSON ELEMENTARY
CHAPPARAL SCHOOLS
ANTHONY ELEMENTARY
HARPER ELEMENTARY

HAYSVILLE PUBLIC SCHOOLS
NELSON ELEMENTARY
RUTH CLARK ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
PRIVATE
BLESSED SACRAMENT CATHOLIC
CHRIST THE SAVIOR ACADEMY
SAINT MARY CATHOLIC
TRINITY ACADEMY

VALLEY CENTER SCHOOLS
ABILENE ELEMENTARY

WICHITA PUBLIC SCHOOLS
ALLEN ELEMENTARY
BENTON ELEMENTARY
BUCKNER PERFORMING ARTS AND SCIENCE
MCLEAN SCIENCE AND TECHNOLOGY
MUELLER

LOUISIANA

BATON ROUGE
Bayou State STARBASE
Service Component: National Guard
Military Location: Off-base
Address: 13770 Highway 77
Rosedale, Louisiana 70772
Tel: 225-238-0250
Director: Regina Corcoran
Email: bayoustatestarbase@gmail.com
Website: None

EAST BATON ROUGE PARISH SCHOOL DISTRICT
CAPITAL ELEMENTARY
FOREST HEIGHTS ELEMENTARY
PARK ELEMENTARY
WESTDALE HEIGHTS
WHITEHILLS ELEMENTARY

IBERVILLE PARISH SCHOOL DISTRICT
CRESCENT ELEMENTARY
DORSEYVILLE ELEMENTARY
EAST IBERVILLE ELEMENTARY
IBERVILLE CHARTER
MSA EAST ELEMENTARY
NORTH IBERVILLE ELEMENTARY

POINTE COUPEE PARISH SCHOOL DISTRICT
FALSE RIVER ACADEMY
POINT COUPEE STEM ELEMENTARY
ROSENWALD ELEMENTARY
UPPER POINTE COUPEE ELEMENTARY
ROUGON ELEMENTARY
VALVERDA ELEMENTARY

WEST BATON ROUGE PARISH SCHOOL DISTRICT
COHN ELEMENTARY
DEVALL MIDDLE
LUKEVILLE ELEMENTARY

BOSSIER CITY
STARBASE Louisiana*
Service Component: Air Force Reserve
Military Location: Barksdale Air Force Base
Address: 827 Twining Drive
Building 4238
Barksdale AFB, Louisiana 71110
Tel: 318-529-3521
Director: Kathy Brandon
Email: starbasela@gmail.com
Website: www.307bw.afrc.af.mil/units/starbaselouisiana.aspx

BOSSIER PARISH SCHOOLS
APOLLO ELEMENTARY
BOSSIER ELEMENTARY
CARRIE MARTIN ELEMENTARY
KINGSTON ELEMENTARY
LEGACY ELEMENTARY
MEADOWVIEW ELEMENTARY
PLANTATION PARK ELEMENTARY
PRINCETON ELEMENTARY
STOCKWELL PLACE ELEMENTARY
WALLER ELEMENTARY

CADDISCO PARISH SCHOOLS
CHEROKEE PARK ELEMENTARY
CRESWELL ELEMENTARY
CURTIS ELEMENTARY
MOORINGSPORT ELEMENTARY
RIVERSIDE ELEMENTARY
SHREVE ISLAND ELEMENTARY
WERNER PARK ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
PRIVATE
FIRST BAPTIST CHURCH SCHOOL
PROVIDENCE CLASSICAL ACADEMY
SOUTFIELD SCHOOL
ST. JOHN BERCHMANS CATHEDRAL SCHOOL
WORD OF GOD ACADEMY

NEW ORLEANS
STARBASE Jackson Barracks*
Service Component: National Guard
Military Location: Army National Guard, Jackson Barracks
Address: 6400 St. Claude Ave
New Orleans, Louisiana 70117
Tel: 504-278-8440
Director: Major John Meche
Email: jbostamarse@gmail.com
Website: None

ARCHDIOCESE OF NEW ORLEANS
MARTIN BEHRMAN CHARTER ACADEMY OF CREATIVE ARTS
ST. PETER

HOME SCHOOL
NOLA HOMESCHOOLERS

JEFFERSON PARISH SCHOOL DISTRICT
SMOTHERS ACADEMY

ORLEANS PARISH SCHOOL DISTRICT
ANDREW H. WILSON
BEN FRANKLIN ELEMENTARY MATHEMATICS AND SCIENCE
EDWARD HYNES CHARTER
ESPERANZA CHARTER
FANNIE C. WILLIAMS CHARTER
JAMES M. SINGLETON CHARTER
JOSEPH A. CRAIG CHARTER
MARTIN LUTHER KING CHARTER

PLAQUEMINES PARISH SCHOOL DISTRICT
BELLE CHASSE ACADEMY

PRIVATE
LYNN OAKS SCHOOL

ST. BERNARD PARISH SCHOOL DISTRICT
ARABI ELEMENTARY
W. SMITH JR. ELEMENTARY

PINEVILLE
Pelican State STARBASE*
Service Component: National Guard
Military Location: Camp Beauregard
Address: 609 F. Street
Camp Beauregard
Pineville, Louisiana 71360
Tel: 318-290-5252
Director: Nancy Brinkerhoff-Force
Email: geauxpelicanstateSTARBASE@gmail.com
Website: None

DIOCESE OF ALEXANDRIA
OUR LADY OF PROMPT SUCCOR
SACRED HEART

GRACE PRESBYTERIAN CHURCH
GRACE CHRISTIAN

GRANT PARISH
COLFAX ELEMENTARY
SOUTH GRANT ELEMENTARY

HOME SCHOOL
CENLA CHRISTIAN HOME SCHOOL ASSOCIATION

INDEPENDENT SCHOOLS ASSOCIATION
OF THE SOUTHWEST
ALEXANDRIA COUNTRY DAY SCHOOL

RAPIDES PARISH
ACADIAN ELEMENTARY
ALMA REDWINE ELEMENTARY
CARTER C. RAYMOND ELEMENTARY
D.F. HUDDLE ELEMENTARY
FOREST HILL ELEMENTARY
GLENMORA HIGH
HADNOT-HAYES ELEMENTARY
JULIUS PATRICK ELEMENTARY
LESSIE MOORE ELEMENTARY
MABEL BRASHER ELEMENTARY
MARTIN PARK ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
**MASSACHUSETTS**

**BEDFORD**

STARBASE Hanscom  
Service Component: Air Force  
Military Location: Hanscom Air Force Base  
Address: 98 Barksdale Street  
Hanscom AFB, Massachusetts 01730  
Tel: 781-862-4015  
Director: Peter Holden, PhD  
Email: admin@mass-starbase.org  
Website: www.mass-starbase.org

AYER-SHIRLEY REGIONAL SCHOOL DISTRICT  
LURA A. WHILE  
PAGE-HILTOP ELEMENTARY

BILLERICA PUBLIC SCHOOLS  
THOMAS DITSON ELEMENTARY

LEOMINSTER PUBLIC SCHOOLS  
FALLBROOK ELEMENTARY  
FRANCIS DRAKE ELEMENTARY  
JOHNNY APPLESEED ELEMENTARY  
NORTHWEST ELEMENTARY

LINCOLN PUBLIC SCHOOLS  
HANSCOM MIDDLE

LOWELL PUBLIC SCHOOLS  
ROGERS STEM ACADEMY

MALDEN PUBLIC SCHOOLS  
LINDEN STEAM ACADEMY

**MICHIGAN**

**ALPENA**

STARBASE Alpena*  
Service Component: National Guard  
Military Location: Alpena Combat Readiness Training Center  
Address: 5884 A Street  
Alpena, Michigan 49707  
Tel: 989-354-6332  
Director: Steven Tezak  
Email: stezak@starbasealpena.org  
Website: www.starbasealpena.org

ALCONA COMMUNITY SCHOOLS  
ALCONA COMMUNITY HIGH  
ALCONA ELEMENTARY

ALPENA PUBLIC SCHOOLS  
BESSER ELEMENTARY  
ELLA M. WHITE SCHOOL  
HINKS SCHOOL  
LINCOLN COMMUNITY SCHOOL  
SANBORN SCHOOL  
WILSON COMMUNITY SCHOOL

FAIRVIEW AREA SCHOOLS  
FAIRVIEW SCHOOL

HILLMAN COMMUNITY SCHOOLS  
HILLMAN COMMUNITY JR/SR HIGH  
HILLMAN ELEMENTARY

POSEN CONSOLIDATED SCHOOL DISTRICT NO. 9  
POSEN ELEMENTARY

PRIVATE  
ALL SAINTS CATHOLIC  
COOPERATIVE OF ALPENA – AREA CHRISTIAN SCHOOLS  
IMMANUEL LUTHERAN  
ST. IGNATIUS CATHOLIC  
ST. JOHN LUTHERAN

ROGERS CITY AREA SCHOOLS  
ROGERS CITY ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
BATTLE CREEK

STARBASE Battle Creek*
Service Component: National Guard
Military Location: 110th ATKW Battle Creek National Guard
Address: 3595 Mustang Avenue
Battle Creek ANG Base, Michigan 49037
Tel: 269-969-3219
Director: Bruce Medaugh
Email: bmedaugh@starbasebattlecreek.org
Website: None

BATTLE CREEK AREA CATHOLIC SCHOOLS
ST. JOSEPH ELEMENTARY

BATTLE CREEK PUBLIC SCHOOLS
ANN J. KELLOGG
VALLEY VIEW ELEMENTARY
VERONA ELEMENTARY

BELLEVUE PUBLIC SCHOOLS
BELLEVUE ELEMENTARY

COLON PUBLIC SCHOOLS
COLON ELEMENTARY

DELTON KELLOGG PUBLIC SCHOOLS
DELTON KELLOGG MIDDLE

GALESBURG-AUGUSTA COMMUNITY SCHOOLS
GALESBURG-AUGUSTA MIDDLE

HASTINGS COMMUNITY SCHOOLS
CENTRAL ELEMENTARY
NORTHEASTERN ELEMENTARY
SOUTHEASTERN ELEMENTARY
STAR ELEMENTARY

LAKEWOOD PUBLIC SCHOOLS
LAKEWOOD MIDDLE

LAWTON COMMUNITY SCHOOLS
LAWTON ELEMENTARY

MAR LEE SCHOOL
MAR LEE SCHOOL

PARCHMENT PUBLIC SCHOOLS
NORTHWOOD ELEMENTARY

PENNFIELD SCHOOLS
DUNLAP ELEMENTARY

THORNAPPLE KELLOGG PUBLIC SCHOOLS
PAGE ELEMENTARY

THREE RIVERS COMMUNITY SCHOOLS
PARK ELEMENTARY

MOUNT CLEMENS

STARBASE One*
Service Component: National Guard
Military Location: Selfridge National Guard Base
Address: 27310 D Street
Selfridge ANGB, Michigan 48045
Tel: 586-239-4884
Director: Rick Simms
Email: rsimms@starbaseone.org
Website: www.starbaseone.org

ANCHOR BAY PUBLIC SCHOOLS
ASHLEY ELEMENTARY
DEAN A. NALDRETT ELEMENTARY
GREAT OAKS ELEMENTARY
LOTTIE SCHMIDT ELEMENTARY
MACONCE ELEMENTARY
SUGARBUSH ELEMENTARY

ARMADA PUBLIC SCHOOLS
KRAUSE ELEMENTARY

CHARTER - NEW HAVEN
MERRITT ACADEMY

CHARTER - WARREN
SUCCESS MILE ACADEMY

DETROIT PUBLIC SCHOOLS
BENNETT ELEMENTARY
CARVER ELEMENTARY
CHRYSLER ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
CLIPPERT ACADEMY
DAVISON ELEMENTARY
THIRKELL ELEMENTARY

ECORSE PUBLIC SCHOOLS
GRANDPORT ACADEMY

LAMPHERE PUBLIC SCHOOLS
HILLER ELEMENTARY

L’ANSE CREUSE PUBLIC SCHOOLS
DONALD J. YACKS ELEMENTARY
EMMA V. LOBBESTAEL ELEMENTARY
GREEN ELEMENTARY
FRANCIS A. HIGGINS ELEMENTARY
SOUTH RIVER ELEMENTARY

NEW HAVEN COMMUNITY SCHOOLS
ENDEAVOUR ELEMENTARY
NEW HAVEN ELEMENTARY

PRIVATE SCHOOL - CLINTON TWP
TRINITY LUTHERAN

PRIVATE SCHOOL - ST. CLAIR SHORES
ST. GERMAINE CATHOLIC

RICHMOND COMMUNITY SCHOOLS
RICHMOND MIDDLE

RIVER ROUGE SCHOOLS
RIVER ROUGE STEM ACADEMY

SOUTH LAKE PUBLIC SCHOOLS
ELMWOOD ELEMENTARY

MINNESOTA

DULUTH

STARBASE Minnesota - Duluth
Service Component: Air National Guard
Military Location: Base Civil Engineering Building
Address: 4630 Mustang Drive, Building 252
55811 Duluth, MN
Tel: 218-788-7288
Director: Charity Rupp
Email: crupp@starbasemn.org
Website: www.starbasemn.org

DULUTH CATHOLIC SCHOOL SYSTEM
STELLA MARIS ACADEMY

DULUTH EDISON CHARTER SCHOOL
RALEIGH EDISON

DULUTH PUBLIC SCHOOL DISTRICT
CONGON ELEMENTARY
HOMEcroft ELEMENTARY
LAKEWOOD ELEMENTARY
LAURA MACARTHUR ELEMENTARY
LESTER PARK ELEMENTARY
LOWELL ELEMENTARY
MYERS WILKINS ELEMENTARY
PIEDMONT ELEMENTARY
STOWE ELEMENTARY

TRIBAL SCHOOL
FOND DU LAC OJIBWE SCHOOL

ST. PAUL

STARBASE Minnesota - St. Paul*
Service Component: National Guard
Military Location: 133rd Airlift Wing
Address: 659 Mustang Avenue
St. Paul, Minnesota 55111
Tel: 612-713-2530
Director: Kim Van Wie
Email: kvanwie@starbasemn.org
Website: www.starbasemn.org

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
ANOKA-HENNEPIN PUBLIC SCHOOLS
UNIVERSITY AVENUE SCHOOL ACES

EDEN PRAIRIE PUBLIC SCHOOLS
OAK POINT ELEMENTARY

HOPKINS PUBLIC SCHOOLS
ALICE SMITH ELEMENTARY
EISENHOWER ELEMENTARY
GLEN LAKE ELEMENTARY
L.H. TANGLEN ELEMENTARY
MEADOWBROOK ELEMENTARY
XINXING ACADEMY

MINNEAPOLIS PUBLIC SCHOOLS
BANCROFT ELEMENTARY
BRYN MAWR COMMUNITY SCHOOL
EMERSON SILC (SPANISH IMMERSION LEARNING CENTER)
JEFFERSON COMMUNITY
LAKE NOKOMIS - KEEWAYDIN
LORING COMMUNITY
PILLSBURY ELEMENTARY

NORTH ST. PAUL, OAKDALE, MAPLEWOOD PUBLIC SCHOOLS
COWERN ELEMENTARY
EAGLE POINT ELEMENTARY
SKYVIEW ELEMENTARY
WEAVER ELEMENTARY

PRIVATE
FRASSATI CATHOLIC ACADEMY
MATERNITY OF MARY - ST. ANDREW
RISEN CHRIST CATHOLIC
ST. JEROME SCHOOL
ST. ROSE OF LIMA CATHOLIC

ROSEMOUNT-APPLE VALLEY-EAGAN PUBLIC SCHOOLS
ECHO PARK ELEMENTARY
NORTHVIEW ELEMENTARY
OAK RIDGE ELEMENTARY
WESTVIEW ELEMENTARY

ST. PAUL CHARTER SCHOOL
ACHIEVE LANGUAGE ACADEMY
AFSA MIDDLE

COMMUNITY OF PEACE ACADEMY
DISCOVERY CHARTER STEM SCHOOL
FRIENDSHIP ACADEMY OF FINE ARTS

ST. PAUL PUBLIC SCHOOLS
BATTLE CREEK ELEMENTARY
FARNSWORTH AEROSPACE ELEMENTARY
PHALEN LAKE HMONG STUDIES MAGNET
HAMLIN ELEMENTARY
JIE MING MANDARIN IMMERSION

MONTANA

GREAT FALLS

STARBASE Great Falls
Service Component: National Guard
Military Location: Montana National Guard 120th Airlift Wing
Address: 2800 Airport Avenue B
Great Falls, Montana 59404
Tel: 406-791-0806
Director: Wendy Fechter
Email: wendyfechter@mt.gov
Website: None

CENTERVILLE PUBLIC SCHOOLS
CENTERVILLE ELEMENTARY

GREAT FALLS PUBLIC SCHOOL DISTRICT
CHIEF JOSEPH ELEMENTARY
LEWIS AND CLARK ELEMENTARY
LINCOLN ELEMENTARY
LONGFELLOW ELEMENTARY
LOY ELEMENTARY
MEADOWLARK ELEMENTARY
MORNINGSIDE ELEMENTARY
MOUNTAIN VIEW ELEMENTARY
RIVERVIEW ELEMENTARY
ROOSEVELT ELEMENTARY
SACAJAWEA ELEMENTARY
SUNNYSIDE ELEMENTARY
VALLEY VIEW ELEMENTARY
WEST ELEMENTARY
WHITTIER ELEMENTARY SCHOOL

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
HARDIN PUBLIC SCHOOL DISTRICT
CROW AGENCY PUBLIC

HIGHWOOD PUBLIC SCHOOL DISTRICT
HIGHWOOD ELEMENTARY

PRIVATE
FIVE FALLS CHRISTIAN

HELENA
STARBASE Fort Harrison
Service Component: National Guard
Military Location: Fort Harrison National Guard
Address: 1956 Mt Majo Street
Fort Harrison, Montana 59636
Tel: 406-324-3727
Director: Dr. Michael Vannatta
Email: mvannatta@mt.gov
Website: None

CLANCY SCHOOL DISTRICT
CLANCY ELEMENTARY

EAST HELENA PUBLIC SCHOOLS
ROBERT H. RADLEY ELEMENTARY

HELENA PUBLIC SCHOOLS
BROADWATER ELEMENTARY
BRYANT ELEMENTARY
CENTRAL ELEMENTARY
FOUR GEORGIANS ELEMENTARY
JEFFERSON ELEMENTARY
JIM DARCY ELEMENTARY
KESSLER ELEMENTARY
ROSSITER ELEMENTARY
SMITH ELEMENTARY
WARREN ELEMENTARY

LINCOLN PUBLIC SCHOOLS
LINCOLN ELEMENTARY

MONTANA CITY SCHOOL DISTRICT
MONTANA CITY ELEMENTARY

PRIVATE
ST. ANDREW

WHITE SULFUR SPRINGS SCHOOL DISTRICT
WHITE SULFUR SPRINGS ELEMENTARY

NEVADA

LAS VEGAS
STARBASE Nellis*
Service Component: Air Force Reserve
Military Location: Nellis Air Force Base
Address: 4325 Plattsburg Ave.
Las Vegas, Nevada 89191
Tel: 702-575-3837
Director: Myles Judd
Email: mjudd@starbasenellis.com
Website: starbasenellis.com

CLARK COUNTY
CHARLOTTE AND JERRY KELLER ELEMENTARY
BETSY RHODES ELEMENTARY
HOLLINGSWORTH ELEMENTARY
MONACO MIDDLE
NEAL ELEMENTARY
RICHARD BRYAN ELEMENTARY
UTE V. PERKINS ELEMENTARY
WALTER BRACKEN ELEMENTARY
WALTER LONG
WILHEM ELEMENTARY
ZEL AND MARY LOWMAN ELEMENTARY

NEW MEXICO

ALBUQUERQUE

STARBASE New Mexico*
Service Component: Air Force
Military Location: Kirtland Air Force Base
Address: 1401 Maxwell Street SE, Building 1909
Albuquerque, New Mexico 87117
Tel: 505-853-8110
Director: Esti Gutierrez
Email: stem@afrlnewmexico.com
Website: www.afrlnewmexico.com/afrl-la-luz-academy

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
ARCHDIOCESE OF SANTA FE
   HOLY GHOST CATHOLIC

ALBUQUERQUE PUBLIC SCHOOLS
   ALBUQUERQUE SCHOOL OF EXCELLENCE
   CARLOS REY ELEMENTARY
   DOLORES GONZALES ELEMENTARY
   EMERSON ELEMENTARY
   LOWELL ELEMENTARY
   SANDIA BASE ELEMENTARY
   SEVEN BAR ELEMENTARY

EASTERN NAVAJO EDUCATION LINE OFFICE
   SCHOOL DISTRICT
   BACA/DLO AZHI COMMUNITY SCHOOL

GRANTS-CIBOLA COUNTY SCHOOLS
   MESA VIEW ELEMENTARY

LOS LUNAS PUBLIC SCHOOLS
   PERALTA ELEMENTARY
   SUNDANCE ELEMENTARY
   VALENCIA ELEMENTARY

MAGDELENA MUNICIPAL SCHOOLS
   MAGDELENA ELEMENTARY

MORIARTY-EDGWOOD SCHOOLS
   ROUTE 66 ELEMENTARY
   SOUTH MOUNTAIN ELEMENTARY

PUEBLO OF ISLETA
   ISLETA ELEMENTARY

PRIVATE
   CHRIST LUTHERAN CHURCH AND SCHOOL

NORTH CAROLINA

CHARLOTTE

STARBASE Charlotte*
   Service Component: National Guard
   Military Location: National Guard 145th Airlift Wing
   Address: 4930 Minuteman Way
   Charlotte, North Carolina 28208
   Tel: 704-398-4819
   Director: Thomas Brown
   Email: thomasbrown0083@gmail.com
   Website: https://www.facebook.com/starbasecharlotte/

CHARLOTTE-MECKLENBURG SCHOOL SYSTEM
   BARRINGER ELEMENTARY
   BEVERLY WOODS ELEMENTARY
   KIPP CHARLOTTE
   LONG CREEK ELEMENTARY
   PARK ELEMENTARY
   PINEVILLE ELEMENTARY

GASTON COUNTY SCHOOLS
   CATAWBA HEIGHTS ELEMENTARY

LINCOLN COUNTY SCHOOL SYSTEM
   LINCOLN CHARTER
   ROCK SPRINGS ELEMENTARY
   ST. JAMES ELEMENTARY

MADISON COUNTY SCHOOL SYSTEM
   BRUSH CREEK ELEMENTARY

YANCEY COUNTY SCHOOLS
   BALD CREEK ELEMENTARY

YADKIN COUNTY SCHOOLS
   BALD CREEK ELEMENTARY
   BOONVILLE ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
**KURE BEACH**

**STARBASE Ft. Fisher***
Service Component: National Guard
Military Location: North Carolina National Guard Training Center
Address: 116 Air Force Way
Kure Beach, North Carolina 28120
Tel: 910-520-9990, #5, #1
Director: Thomas Brown
Email: fortfisherstarbase@gmail.com
Website: None

**BRUNSWICK COUNTY SCHOOL SYSTEM**
BELVILLE ELEMENTARY
BOLIVIA ELEMENTARY
UNION ELEMENTARY

**NEW HANOVER COUNTY SCHOOLS**
ANDERSON ELEMENTARY
BRADLEY CREEK ELEMENTARY
COASTAL PREPARATORY AC
CODINGTON ELEMENTARY
COLLEGE PARK ELEMENTARY
EATON ELEMENTARY
FOREST HILLS ELEMENTARY
JOHN J. BLAIRELEMENTARY
MARY C. WILLIAMS ELEMENTARY
PINE VALLEY ELEMENTARY
WRIGHTSVILLE ELEMENTARY
SUNSET PARK ELEMENTARY

**NORTH DAKOTA**

**MINOT**

**STARBASE North Dakota**
Service Component: Air Force
Military Location: Minot Air Force Base
Address: 101 C Street
Minot AFB, North Dakota 58704
Tel: 701-727-3439
Director: Jenica R. Swenson
Email: jenica.swenson@minot.k12.nd.us
Website: http://www.minot.k12.nd.us/starbase-f1c92

**MINOT PUBLIC SCHOOLS**
BEL AIR ELEMENTARY
BEL ELEMENARY
DAKOTA ELEMENTARY
EDISON ELEMENTARY
JOHN HOEVEN ELEMENTARY
LEWIS AND CLARK ELEMENTARY
LONGFELLOW ELEMENTARY
MCKINLEY ELEMENTARY
NORTH PLAINS ELEMENTARY
PERKETT ELEMENTARY
ROOSEVELT ELEMENTARY
SUNNYSIDE ELEMENTARY
WASHINGTON ELEMENTARY

**OHIO**

**DAYTON**

**STARBASE Wright-Patt***
Service Component: Air Force
Military Location: Wright-Patterson Air Force Base
Address: 2261 Monahan Way, Bldg. 196
Dayton, Ohio 45433
Tel: 937-938-4859
Director: Daniel Andrews
Email: daniel.andrews.1@us.af.mil
Website: www.wpafbstem.com

**BEAVERCREEK CITY SCHOOLS**
FAIRBROOK ELEMENTARY
MAIN ELEMENTARY
PARKWOOD ELEMENTARY
SHAW ELEMENTARY
TREBEIN ELEMENTARY
VALLEY ELEMENTARY

**DAYTON PUBLIC SCHOOLS**
BELL HAVEN PRE K-6
CHARITY ADAMS EARLY ACADEMY FOR GIRLS
HORACE MANN PRE K-6
KISER PRE K-6
RUSKIN PRE K-6
WESTWOOD PRE K-6

*Indicates location also coordinates a DoD STARBASE 2.0 Program.*
FAIRBORN CITY SCHOOLS
FAIRBORN INTERMEDIATE SCHOOL

HUBER HEIGHTS CITY SCHOOLS
CHARLES HUBER ELEMENTARY
MONTICELLO ELEMENTARY
RUSHMORE ELEMENTARY
VALLEY FORGE ELEMENTARY
WRIGHT BROTHERS ELEMENTARY

JEFFERSON TOWNSHIP LOCAL SCHOOLS
BLAIRWOOD ELEMENTARY

KETTERING CITY SCHOOLS
BEAVERTOWN ELEMENTARY
GREENMONT ELEMENTARY
INDIAN RIFFLE ELEMENTARY
JOHN F. KENNEDY ELEMENTARY
OAKVIEW ELEMENTARY

MAD RIVER LOCAL SCHOOLS
SPINNING HILLS MIDDLE

NEW LEBANON LOCAL SCHOOLS
DIXIE MIDDLE

PRIVATE
ST. HELENS INCARNATION SCHOOL

XENIA COMMUNITY SCHOOLS
ARROWOOD ELEMENTARY
COX ELEMENTARY
MCKINLEY ELEMENTARY
SHAWNEE ELEMENTARY
TECUMSEH ELEMENTARY

YELLOW SPRINGS VILLAGE SCHOOLS
MILLS LAWN ELEMENTARY

OKLAHOMA

Elk City

STARBASE Oklahoma – Burns Flat*
Service Component: National Guard
Military Location: NA
Address: 9131 E. Viper Street
Oklahoma City, Oklahoma 74115
Tel: 918-833-7757
Director: Pamela Kirk
Email: pamela@starbaseok.org
Website: None

ARAPAHO/BUTLER PUBLIC SCHOOLS
ARPAHO/BUTLER ELEMENTARY

BURNS FLAT-DILL CITY PUBLIC SCHOOLS
WILL ROGERS ELEMENTARY

CANUTE PUBLIC SCHOOLS
CANUTE ELEMENTARY
CHOCTAW ELEMENTARY

HAMMON PUBLIC SCHOOLS
HAMMON ELEMENTARY

LEEDEY PUBLIC SCHOOLS
LEEDEY ELEMENTARY SCHOOL

MERRITT PUBLIC SCHOOLS
MERRITT ELEMENTARY

GOTEBO PUBLIC SCHOOLS
MOUNTAIN VIEW GOTEBO ELEMENTARY SCHOOL

SENTINEL PUBLIC SCHOOL
SENTINEL ELEMENTARY SCHOOL

SWEETWATER PUBLIC SCHOOLS
SWEETWATER ELEMENTARY

THOMAS FAY CUSTER SCHOOLS
THOMAS FAY CUSTER ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
Lawton

STARBASE Oklahoma - Fort Still*
Service Component: National Guard
Military Location: Fort Still
Address: 9131 E. Viper Street
Oklahoma City, Oklahoma 74115
Tel: 918-833-7757
Director: Pamela Kirk
Email: pamela@starbaseok.org
Website: None

BOONE-APACHE PUBLIC SCHOOLS
APACHE ELEMENTARY

DIBBLE PUBLIC SCHOOLS
DIBBLE ELEMENTARY

DUNCAN PUBLIC SCHOOLS
HORACE MANN ELEMENTARY
MARK TWAIN ELEMENTARY
PLATO ELEMENTARY
WOODROW WILSON ELEMENTARY

FLOWER MOUND PUBLIC SCHOOLS
FLOWER MOUND ELEMENTARY

GERONIMO PUBLIC SCHOOLS
GERONIMO ELEMENTARY

INDIAHOMA PUBLIC SCHOOLS
INDIAHOMA ELEMENTARY

LAWTON PUBLIC SCHOOLS
ALMOR WEST ELEMENTARY
CARRIAGE HILLS ELEMENTARY
CLEVELAND ELEMENTARY
CROSBY PARK ELEMENTARY
FREEDOM ELEMENTARY
HUGH BISH ELEMENTARY
JOHN ADAMS ELEMENTARY
LINCOLN ELEMENTARY
PAT HENRY ELEMENTARY
PIONEER PARK ELEMENTARY
RIDGECREST ELEMENTARY

SULLIVAN VILLAGE ELEMENTARY
WASHINGTON ELEMENTARY
WHITTER ELEMENTARY
WOODLAND HILLS ELEMENTARY

PRIVATE
LAWTON CHRISTIAN
RIVERSIDE INDIAN
ST. MARY’S CATHOLIC

STERLING PUBLIC SCHOOLS
STERLING ELEMENTARY

OKLAHOMA CITY

STARBASE Oklahoma -Tinker AFB*
Service Component: National Guard
Military Location: Tinker Air Force Base
Address: 9131 E. Viper Street
Oklahoma City, Oklahoma 74115
Tel: 918-833-7757
Director: Pamela Kirk
Email: pamela@starbaseok.org
Website: None

CHOCTAW-NICOMA PARK SCHOOLS
CHOCTAW ELEMENTARY
JAMES GRIFFITH INTERMEDIATE
NICOMA PARK INTERMEDIATE
WESTFALL ELEMENTARY

CROOKED OAK PUBLIC SCHOOLS
CENTRAL OAK ELEMENTARY

CRUTCHO PUBLIC SCHOOLS
CRUTCHO ELEMENTARY

EDMOND PUBLIC SCHOOLS
RUSSELL DOUGHERTY ELEMENTARY

HOME SCHOOLS
CHOCTAW COMMUNITY HOME SCHOOL GROUP

MID-DEL PUBLIC SCHOOLS
DEL CITY ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
OKLAHOMA CITY PUBLIC SCHOOLS
SPENCER ELEMENTARY
TELSTAR ELEMENTARY
WILLOW BROOK ELEMENTARY

PRIVATE
BISHOP JOHN CARROLL CATHOLIC
MERCY SCHOOL INSTITUTE
ST. CHARLES BORROMEO CATHOLIC
ST. JAMES THE GREATER
ST. JOHN NEPOMUK CATHOLIC
ST. PHILIP NERI CATHOLIC
TINKER YOUTH CENTER GROUP

WILL ROGERS AIR FORCE BASE
WILL ROGERS SUMMER CAMP

TULSA
STARBASE Oklahoma - Tulsa*
Service Component: National Guard
Military Location: Tulsa National Guard Base
Address: 9131 E. Viper Street
Tulsa, Oklahoma 74115
Tel: 918-833-7757
Director: Pamela Kirk
Email: pamela@starbaseok.org
Website: www.dodstarbase.org

BEGGS PUBLIC SCHOOLS
BEGGS ELEMENTARY

CANEY VALLEY PUBLIC SCHOOLS
CANEY VALLEY ELEMENTARY

HOME SCHOOL
TULSA HOME SCHOOL

HOMINY PUBLIC SCHOOLS
HORACE MANN ELEMENTARY

KANSAS PUBLIC SCHOOLS
KANSAS ELEMENTARY

MUSKOGEE PUBLIC SCHOOLS
MUSKOGEE SUMMER CAMP BFSA
MUSKOGEE SUMMER CAMP MLK CENTER

OWASSO PUBLIC SCHOOLS
BARNES ELEMENTARY
HODSON ELEMENTARY SCHOOL
MILLS ELEMENTARY

PRIVATE
ALL SAINTS CATHOLIC
REJOICE CHRISTIAN
STS. PETER AND PAUL CATHOLIC

PRYOR PUBLIC SCHOOLS
JEFFERSON ELEMENTARY
LINCOLN ELEMENTARY

SEQUOYAH SCHOOLS
CHEROKEE NATION SUMMER CAMP

TULSA AIR NATIONAL GUARD BASE
TECH KIDS SUMMER CAMP

TULSA PUBLIC SCHOOLS
MARSHALL ELEMENTARY
MCCLURE ELEMENTARY
PEARY ELEMENTARY
WALT WHITMAN ELEMENTARY

UNION PUBLIC SCHOOLS
JOHNSON O’MALLEY PROGRAM

VERDIGRIS PUBLIC SCHOOLS
VERDIGRIS UPPER ELEMENTARY

WOODALL PUBLIC SCHOOLS
WOODALL ELEMENTARY

WYNONA PUBLIC SCHOOLS
WYNONA ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
OREGON

KLAMATH FALLS

STARBASE Kingsley*
Service Component: National Guard
Military Location: Kingsley Field National Guard Base
Address: 302 Bong Street, Suite 19
Klamath Falls, Oregon 97603
Tel: 541-885-6472
Director: Denise Kortes
Email: starbasekingsleydd@gmail.com
Website: None

HOME SCHOOL
CLASSICAL CONVERSATIONS

KLAMATH COUNTY SCHOOL DISTRICT
BONANZA ELEMENTARY
CHILOQUIN ELEMENTARY
FERGUSON ELEMENTARY
GILCHRIST ELEMENTARY
GREAT BASIN HOMESCHOOL CENTER
HENLEY ELEMENTARY
KENO ELEMENTARY
MALIN ELEMENTARY
MERRILL ELEMENTARY
PETERSON ELEMENTARY
SHASTA ELEMENTARY
STEARNS ELEMENTARY

KLAMATH FALLS CITY SCHOOLS
CONGER ELEMENTARY
MILLS ELEMENTARY
PELICAN ELEMENTARY
ROOSEVELT ELEMENTARY

PRIVATE
HOSANNA CHRISTIAN ACADEMY
TRIAD SCHOOL

PORTLAND

STARBASE Portland*
Service Component: National Guard
Military Location: Portland National Guard
Address: 6801 NE Cornfoot Road
Portland, Oregon 97218
Tel: 503-972-8630
Director: Denise Kortes
Email: starbaseportland@gmail.com
Website: None

BEAVERTON
CHEHALEM ELEMENTARY
MCKAY ELEMENTARY
VOSE ELEMENTARY

CANBY
CECIL TROST ELEMENTARY
KNIGHT ELEMENTARY
LEE ELEMENTARY

GRESHAM
CLASSICAL CONVERSATIONS

PORTLAND PUBLIC SCHOOLS
ASTOR ELEMENTARY
BIOSE ELIOT ELEMENTARY
FAUBION ELEMENTARY
HARRISON PARK
JASON LEE ELEMENTARY
ROSA PARKS
RIGLER ELEMENTARY
SITTON ELEMENTARY
WOODLAWN ELEMENTARY

REYNOLDS
ALDER ELEMENTARY
MARGARET SCOTT
WILKES ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
**PUERTO RICO**

**CAROLINA**

STARBASE Puerto Rico  
Service Component: National Guard  
Military Location: 156 AW Muñiz ANG Base  
Address: 200 Jose A. Tony Santana Avenue. Carolina, Puerto Rico 00979  
Tel: 787-253-5100 X-2539502  
Director: Urbano Ayala  
Email: puertorico@starbase@gmail.com  
Website: None

**AAGUADILLA**  
LICEO AAGUADILLANO

**BAYAMÓN**  
CAMPAMENTO ARTIC

**BARRANQUITAS**  
INTERMEDIA BO. QUEBRADILL

**CAGUAS**  
SU. PASTO MONTESSORI

**CANÓVANAS**  
FÉLIX SÁNCHEZ CRUZ  
ROSENDO MATIENZO CINTRÓN

**CAROLINA**  
PASCASIO P. SANCERRIT  
PRISCO FUENTES ALLENDE

**CIALES**  
SU. TORIBIO RIVERA

**CIDRAS**  
SU. CERTENEJAS

**COROZAL**  
MANUEL BOU GALÍ

**GUAYNABO**  
ROSALINA C. MARTINEZ

**GUAYAMA**  
ACADEMIA SAN ANTONIO

**GURABO**  
SU. VIDAL SERRANO

**HUMACAO**  
ANA ROQUE DE DUPREY  
LIGA ATLETICA POLICIACA DE HUMACAO

**PRIVATE**  
CENTRO JOAQUINA DE VEDRUNA  
ESCUELA CLAGILL  
WALK WEBS

**SAN JUAN**  
COLEGIO SANTA CLARA  
DR. ANTONIO PEDREIRA  
DR. MODESTO RIVERA  
GERARDO SELLÉS SOLÁ  
JULIO SELLÉS SOLÁ  
VILLA GRANADA  
BORIKEN EDUCA  
ARMY DEPENDENTS GROUP

**VEGA ALTA**  
ALFONSO LÓPEZ GARCÍA  
ESCUELA ECOLÓGICO DE JOSÉ DE DIEGO

**YABUCOA**  
MANUEL TORRES VILLAAFANE

**SOUTH CAROLINA**

**BEAUFORT**

STARBASE MCAS Beaufort  
Service Component: Marine Corps  
Military Location: Marine Corps Air Station Beaufort  
Address: 1011 Geiger Blvd  
Beaufort, South Carolina 29904  
Tel: 843-524-1320  
Director: Savannah French  
Email: starbase.mcasbeaufort@gmail.com

*Indicates location also coordinates a DoD STARBASE 2.0 Program.*
BEAUFORT COUNTY SCHOOL DISTRICT
BEAUFORT ELEMENTARY
BROAD RIVER ELEMENTARY
COOSA ELEMENTARY
JOSEPH S. SHANKLIN ELEMENTARY
MICHAEL C. RILEY ELEMENTARY
MOSSY OAKS ELEMENTARY
PITCHARDVILLE ELEMENTARY
PORT ROYAL ELEMENTARY
RED CEDAR ELEMENTARY
ROBERT SMALLS INTERNATIONAL ACADEMY
SAINT HELENA ELEMENTARY
WHALE BRANCH MIDDLE

PRIVATE
BEAUFORT ACADEMY
HOLY TRINITY CLASSICAL CHRISTIAN
ST. FRANCIS CATHOLIC
ST. GREGORY THE GREAT CATHOLIC
ST. PETERS CATHOLIC
THOMAS HEYWARD ACADEMY

COLUMBIA
STARBASE Swamp Fox*
Service Component: National Guard
Military Location: McEntire Joint National Guard Base
Address: 1325 South Carolina Road
Eastover, South Carolina 29044
Tel: 803-647-8126
Director: John Motley
Email: john.m.motley.nfg@mail.mil
Website: http://www.starbase.org

CALHOUN COUNTY PUBLIC SCHOOLS
SANDY RUN K-8 SCHOOL

DIOCESE OF CHARLESTON
ST. JOSEPH CATHOLIC
ST. PETER’S CATHOLIC

LEXINGTON SCHOOL DISTRICT ONE
DEERFIELD ELEMENTARY

LEXINGTON SCHOOL DISTRICT TWO
B. C. GRAMMAR SCHOOL

LEXINGTON-RICHLAND SCHOOL DISTRICT FIVE
H. E. CORLEY ELEMENTARY
IRMO ELEMENTARY

RICHLAND SCHOOL DISTRICT ONE
BURNSIDE ELEMENTARY
CARVER-LYON ELEMENTARY
GADSDEN ELEMENTARY
HOPKINS ELEMENTARY
HORRELL HILL ELEMENTARY
MILLCREEK ELEMENTARY
WEBBER ELEMENTARY

RICHLAND SCHOOL DISTRICT TWO
FOREST LAKE ELEMENTARY

SOUTH CAROLINA INDEPENDENT SCHOOL ASSOCIATION
WILSON HALL

SUMTER SCHOOL DISTRICT
CROSSWELL DRIVE ELEMENTARY
F. J. DELAINE ELEMENTARY
HIGH HILLS ELEMENTARY
R.E. DAVIS ELEMENTARY
WILLOW DRIVE ELEMENTARY

SOUTH DAKOTA

RAPID CITY
STARBASE NOVA Honor
Service Component: National Guard
Military Location: Camp Rapid
Address: 2823 West Main Street,
Camp Rapid, Building 801
Rapid City, South Dakota 57702
Tel: 605-737-6083
Director: Polly Unterbrunner
Email: polly@sdstarbase.org
Website: sdstarbase.org

CUSTER SCHOOL DISTRICT 16-1
CUSTER ELEMENTARY
HERMOSA ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
**RAPID CITY**

**STARBASE Rapid City***
Service Component: National Guard  
Military Location: Camp Rapid  
Address: 2823 West Main Street, Camp Rapid, Building 801  
Rapid City, South Dakota 57702  
Tel: 605-737-6803  
Director: Polly Unterbrunner  
Email: polly@sdstarbase.org  
Website: sdstarbase.org

**DOUGLAS SCHOOL DISTRICT**
VANDENBERG ELEMENTARY

**RAPID CITY AREA SCHOOLS**
CANYON LAKE ELEMENTARY  
GENERAL BEADLE ELEMENTARY  
HORACE MANN ELEMENTARY  
KNOLLWOOD HEIGHTS ELEMENTARY  
RAPID VALLEY ELEMENTARY  
ROBINSDALE ELEMENTARY  
SOUTH CANYON ELEMENTARY  
SOUTH PARK ELEMENTARY  
VALLEY VIEW ELEMENTARY

**SIOUX FALLS**

**STARBASE NOVA Courage**
Service Component: National Guard  
Military Location: South Dakota National Guard  
Address: 801 W. National Guard Drive  
Sioux Falls, South Dakota 57104  
Tel: 605-367-4930  
Director: Vonny Revell  
Email: sdstarbase@sdstarbase.org  
Website: www.sdstarbase.org

**ANDES CENTRAL SCHOOL DISTRICT**
ANDES CENTRAL SCHOOL

**AVON SCHOOL DISTRICT**
AVON ELEMENTARY

**BIG STONE SCHOOL DISTRICT**
BIG STONE ELEMENTARY

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*Indicates location also coordinates a DoD STARBASE 2.0 Program.*
DE SMET SCHOOL DISTRICT
DE SMET ELEMENTARY

HARRISBURG SCHOOL DISTRICT
FREEDOM ELEMENTARY

HURO N SCHOOL DISTRICT
WASHINGTON SQUARE ELEMENTARY

IROQUOIS SCHOOL DISTRICT
IROQUOIS ELEMENTARY

SISSETON SCHOOL DISTRICT
ROSHOLT ELEMENTARY
WESTSIDE ELEMENTARY

SUMMIT SCHOOL DISTRICT
SUMMIT ELEMENTARY

WAGNER SCHOOL DISTRICT
WAGNER ELEMENTARY

WAUBAY SCHOOL DISTRICT
WAUBAY ELEMENTARY

WEBSTER SCHOOL DISTRICT
WEBSTER ELEMENTARY

WILMONT SCHOOL DISTRICT
WILMONT ELEMENTARY

WOLSEY SCHOOL DISTRICT
WOLSEY-WESSINGTON ELEMENTARY

WAUBAY SCHOOL DISTRICT
ENEMY SWIM DAY SCHOOL

SIOUX FALLS

STARBASE Sioux Falls*
Service Component: National Guard
Military Location: South Dakota National Guard
Address: 801 W. National Guard Drive
Sioux Falls, South Dakota 57104
Tel: 605-367-4930
Director: Vonny Revell
Email: sdstarbase@sdstarbase.org
Website: www.sdstarbase.org

GARRE TSON SCHOOL DISTRICT
GARRE TSON ELEMENTARY

PRIVATE
ST. LAMBERT ELEMENTARY

SIOUX FALLS SCHOOL DISTRICT
ALL CITY ELEMENTARY
ANNE SULLIVAN ELEMENTARY
CLEVELAND ELEMENTARY
EUGENE FIELD ELEMENTARY
GARFIELD ELEMENTARY
HAWTHORNE ELEMENTARY
HAYWARD ELEMENTARY
LAURA B. ANDERSON ELEMENTARY
LOWELL ELEMENTARY
RENBERG ELEMENTARY
ROBERT FROST ELEMENTARY
SUSAN B. ANTHONY ELEMENTARY
TERRY REDLIN ELEMENTARY

TEXAS

AUSTIN

Texas STARBASE-Austin*
Service Component: National Guard
Military Location: Camp Mabry
Address: 2200 W. 25th Street
Austin, Texas 78703
Tel: 512-782-3554
Director: Patrick Yonnone
Email: contactus@starbaseaustin.org
Website: starbaseaustin.org

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
AUSTIN INDEPENDENT SCHOOL DISTRICT
   BARRINGTON ELEMENTARY
   BROWN ELEMENTARY
   SUNSET VALLEY ELEMENTARY

DEL VALLE INDEPENDENT SCHOOL DISTRICT
   BATY ELEMENTARY
   CREEKWOOD ELEMENTARY
   HILLCREST ELEMENTARY
   HORNSBY-DUNLAP ELEMENTARY
   SMITH ELEMENTARY

HUTTO INDEPENDENT SCHOOL DISTRICT
   COTTONWOOD CREEK ELEMENTARY
   HOWARD NORMAN ELEMENTARY
   HUTTO ELEMENTARY
   NADINE JOHNSON ELEMENTARY
   RAY ELEMENTARY
   VETERAN’S HILL ELEMENTARY

LOCKHART INDEPENDENT SCHOOL DISTRICT
   ALMA BREWER STRAWN ELEMENTARY
   PLUM CREEK ELEMENTARY

PRIVATE SCHOOL
   ST. AUSTIN CATHOLIC
   ST. FRANCIS
   ST. IGNATIUS MARTYR SCHOOL
   ST. PAUL LUTHERAN
   ST. THERESA’S CATHOLIC
   THE GIRL’S SCHOOL OF AUSTIN

ROUND ROCK INDEPENDENT SCHOOL DISTRICT
   BERKMAN AIA ELEMENTARY

HOUSTON

Texas STARBASE Houston*
   Service Component: National Guard
   Military Location: 147th Reconnaissance Wing, Ellington Field
   Address: 14657 Sneider Street, Building #1055 & 1056
   Houston, Texas 77034
   Tel: 281-929-2034
   Director: Loraine Guillen
   Email: Texasstarbase@yahoo.com
   Website: None

   *Indicates location also coordinates a DoD STARBASE 2.0 Program.

ARCHDIOCESES OF GALVESTON-HOUSTON
   OUR LADY OF FATIMA
   OUR LADY OF LOURDES
   ST. MARY CATHOLIC
   ST. MARY OF THE PURIFICATION CATHOLIC
   ST. ROSE OF LIMA CATHOLIC
   TRUE CROSS CATHOLIC

GALENA PARK INDEPENDENT SCHOOL DISTRICT
   CIMARRON ELEMENTARY

CLOVERLEAF ELEMENTARY
   DR. SHIRLEY J. WILLIAMSON ELEMENTARY
   GALENA PARK ELEMENTARY
   GREEN VALLEY ELEMENTARY
   HAVARD ELEMENTARY

JACINTO CITY ELEMENTARY
   MACARTHUR ELEMENTARY
   NORMANDY CROSSING ELEMENTARY
   NORTH SHORE ELEMENTARY
   PURPLE SAGE ELEMENTARY
   PYBURN ELEMENTARY
   SAM HOUSTON ELEMENTARY
   TICE ELEMENTARY
   WOODLAND ACRES ELEMENTARY

HOME SCHOOL
   FAITH HOME SCHOOL
   GULF COAST CHRISTIAN HOME SCHOLARS

HOUSTON INDEPENDENT SCHOOL DISTRICT
   SANCHEZ ELEMENTARY
   VALLEY WEST ELEMENTARY

HUMBLE INDEPENDENT SCHOOL DISTRICT
   LAKELAND ELEMENTARY
   WHISPERING PINES ELEMENTARY

LA PORTE INDEPENDENT SCHOOL DISTRICT
   BAYSHORE ELEMENTARY
   COLLEGE PARK ELEMENTARY
   HERITAGE ELEMENTARY
   JENNIE REID ELEMENTARY
   LA PORTE ELEMENTARY
   LEO A. RIZZUTO ELEMENTARY
LOMAX ELEMENTARY
NORTH BELT ELEMENTARY

PASADENA INDEPENDENT SCHOOL DISTRICT
BOBBY SHAW MIDDLE
CARTER LOMAX MIDDLE
DE ZAVAALA MIDDLE
EARNESTINE MILSTEAD MIDDLE
FRED ROBERTS MIDDLE
LONNY B. KELLER MIDDLE
MELILLO MIDDLE
MORRIS MIDDLE
NELDA SULLIVAN MIDDLE
RICK SCHNEIDER MIDDLE

SHELDON INDEPENDENT SCHOOL DISTRICT
CARROLL ELEMENTARY
GARRETT ELEMENTARY
MONAHAN ELEMENTARY
SHELDON ELEMENTARY
SOUTHWESTERN ASSOCIATION OF EPISCOPAL SCHOOLS
ST. THOMAS SW EPISCOPAL

SAN ANGELO
STARBASE Goodfellow
Service Component: Air Force
Military Location: Goodfellow Air Force Base
Address: 221 Texan Street, Building 901
76908 Goodfellow AFB
San Angelo, Texas 76908
Tel: TBD
Director: Katheryn Ganster
Email: starbaseoffice@Samfa.org
Website: TBD

CHRISTOVAL INDEPENDENT SCHOOL DISTRICT
CHRISTOVAL ELEMENTARY

PRIVATE
AMBLESIDE SCHOOL OF SAN ANGELO
CORNERSTONE CHRISTIAN
SAN ANGELO CHRISTIAN ACADEMY
THE POTTER’S HAND
ANGELO CATHOLIC
TRINITY LUTHERAN

SAN ANGELO INDEPENDENT SCHOOL DISTRICT
ALTA LOMA ELEMENTARY
AUSTIN ELEMENTARY
BELAIRE ELEMENTARY
BONHAM ELEMENTARY
BOWIE ELEMENTARY
BRADFORD ELEMENTARY
CROCKETT ELEMENTARY
FANIN ELEMENTARY
FORT CONCHO ELEMENTARY
GLEN MIDDLE
GOLIAD ELEMENTARY
HOLIMAN ELEMENTARY
LAMAR ELEMENTARY
LEE MIDDLE
MCGILL ELEMENTARY
SAN JACINTO ELEMENTARY
SANTA RITA ELEMENTARY
REAGAN ELEMENTARY

TEXAS LEADERSHIP
TEXAS LEADERSHIP CHARTER ACADEMY

SAN ANTONIO
STARBASE Kelly
Service Component: Air Force Reserve
Military Location: JBSA-Lackland
Address: 203 Galaxy Road
JBSA-Lackland, Texas 78236
Tel: 210-925-3708
Director: Juan Villarreal
Email: starbasekelly@gmail.com
Website: None

ARCHDIOCESE OF SAN ANTONIO CATHOLIC SCHOOLS
BLESSED SACRAMENT CATHOLIC
LITTLE FLOWER CATHOLIC SCHOOL
ST. JOHN BERCHMAN CATHOLIC
ST. LEO THE GREAT CATHOLIC

EDGEWOOD INDEPENDENT SCHOOL DISTRICT
GARDENDALE ELEMENTARY
LAS PALMAS ELEMENTARY
ROOSEVELT ELEMENTARY
ROY CISNEROS ELEMENTARY
STAFFORD ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
SOUTHWEST INDEPENDENT SCHOOL DISTRICT
ELM CREEK ELEMENTARY
MEDIO CREEK ELEMENTARY

SOUTH SAN ANTONIO INDEPENDENT SCHOOL DISTRICT
FIVE PALMS ELEMENTARY
FRANK MADLA ELEMENTARY
MIGUEL CARRILLO JR. ELEMENTARY
RODRIGUEZ ELEMENTARY
ROY BENAVIDEZ ELEMENTARY

UTAH

OGDEN

STARBASE Hill Screaming Eagles*
Service Component: Air Force
Military Location: Hill Air Force Base
Address: 5731 E Avenue
Hill AFB, Utah 84056
Tel: 801-586-7494
Director: Frances Bradshaw
Email: frances.bradshaw@starbasehill.com
Website: www.starbasehill.com

CATHOLIC DIOCESES
ST. JOSEPH ELEMENTARY

CHARTER
DAVINCI ACADEMY OF SCIENCE AND ARTS
LEADERSHIP LEARNING ACADEMY
MARIA MONTESSORI ACADEMY
QUEST ACADEMY

DAVIS COUNTY SCHOOL DISTRICT
ADELAIDE ELEMENTARY
ANTELOPE ELEMENTARY
CRESTVIEW ELEMENTARY
DOXEY ELEMENTARY
FREMONT ELEMENTARY
HILL FIELD ELEMENTARY
HOLT ELEMENTARY
KING ELEMENTARY
LINCOLN ELEMENTARY
MEADOWBROOK ELEMENTARY
SAND SPRINGS ELEMENTARY

SNOW HORSE ELEMENTARY
SOUTH CLEARFIELD ELEMENTARY
SUNSET ELEMENTARY
VAE VIEW ELEMENTARY
WASHINGTON ELEMENTARY
WEST POINT ELEMENTARY

HOME SCHOOL
HOME SCHOOL GROUP

VERMONT

RUTLAND

STARBASE Vermont - Rutland
Service Component: National Guard
Military Location: Armed Forces Reserve Center
Address: 2143 Post Road
Rutland, Vermont 05701
Tel: 802-786-3820
Director: Dan Myers
Email: admin@starbasevt.org
Website: www.starbasevt.org

ADDISON CENTRAL SUPERVISORY UNION
SALISBURY COMMUNITY SCHOOL

ADDISON RUTLAND SUPERVISORY UNION
BENSON VILLAGE
CASTLETON ELEMENTARY
FAIR HAVEN GRADE
ORWELL VILLAGE

BENNINGTON RUTLAND SUPERVISORY UNION
CURRIER MEMORIAL
METTAWEE COMMUNITY
SUNDERLAND ELEMENTARY

MILL RIVER UNION SCHOOL DISTRICT
WALLINGFORD ELEMENTARY

ORANGE SOUTHWEST SUPERVISORY UNION
BRAINTREE ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
RUTLAND CENTRAL SUPERVISORY UNION
PROCTOR ELEMENTARY
RUTLAND TOWN
WEST RUTLAND

RUTLAND CITY PUBLIC SCHOOL DISTRICT
RUTLAND INTERMEDIATE

RUTLAND DIOCESE
RUTLAND AREA CHRISTIAN SCHOOL
CHRIST THE KING SCHOOL

RUTLAND NORTHEAST SUPERVISORY UNION
BARSTOW ELEMENTARY
LEICESTER CENTRAL
LOTROP ELEMENTARY
NESHobe
SUDBERRY

RUTLAND SOUTHWEST SUPERVISORY UNION
MIDDLETOWN SPRINGS ELEMENTARY
POULTNEY ELEMENTARY

SOUTHWEST VERMONT SUPERVISORY UNION
SHAFTSBURY ELEMENTARY

TWO RIVERS SUPERVISORY UNION
CAVENdISH TOWN ELEMENTARY
LUDlow ELEMENTARY

WHITE RIVER VALLEY SUPERVISORY UNION
ROCHESTER

WINDHAM CENTRAL SUPERVISORY UNION
JAMAICA VILLAGE
TOWNSHEND ELEMENTARY
WARDSBORO ELEMENTARY

WINDSOR SOUTHEAST SUPERVISORY UNION
ALBERT BRIDGE
MOUNT HOLLY ELEMENTARY
WINDSOR STATE STREET

SOUTH BURLINGTON
STARBASE Vermont - South Burlington
Service Component: National Guard
Military Location: Vermont National Guard
Address: 62 NCO Drive
South Burlington, Vermont 05403
Tel: 802-660-5201
Director: Dan Myers
Email: admin@starbasevt.org
Website: www.starbasevt.org

ADDITION NORTHEAST SUPERVISORY UNION
BRISTOL SCHOOL

BURLINGTON DIOCESE
CHRIST THE KING
ST. FRANCIS XAVIER

BURLINGTON SCHOOL DISTRICT
C.P. SMITH
INTEGRATED ARTS ACADEMY
J.J. FLYNN

CHITTENDEN EAST SUPERVISORY UNION
HINESBURG COMMUNITY

COLCHESTER SCHOOL DISTRICT
MALLETTS BAY SCHOOL

ESSEX TOWN SCHOOL DISTRICT
FOUNDERS MEMORIAL SCHOOL

FRANKLIN CENTRAL SUPERVISORY UNION
SWANTON CENTRAL SCHOOL

FRANKLIN WEST SUPERVISORY UNION
BELLOWS FREE ACADEMY - FAIRFAX
FLETCHER ELEMENTARY

FRANKLIN SOUTHWEST SUPERVISORY UNION
HIGHGATE ELEMENTARY

GRAND ISLE SUPERVISORY UNION
ISLE LAMOTTE
NORTH HERO

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
HOME SCHOOL
   HOME SCHOOL GROUP

LAMOILLE NORTH SUPERVISORY UNION
   CAMBRIDGE ELEMENTARY

SOUTH BURLINGTON SCHOOL DISTRICT
   ORCHARD ELEMENTARY
   WASHINGTON SUPERVISORY UNION
   NORTHFIELD ELEMENTARY

WINOOSKI SCHOOL DISTRICT
   JOHN F. KENNEDY

VIRGINIA

WINCHESTER
   Winchester STARBASE Academy*
   Service Component: National Guard
   Military Location: Virginia National Guard;
      3rd Battalion; 116th Infantry Regiment
   Address: 181 Pendleton Road
   Winchester, Virginia 22602
   Tel: 540-686-4964
   Director: Susan Corrigan
   Email: starbasewinchester@gmail.com
   Website: starbasewinchester.webs.com

CLARKE COUNTY PUBLIC SCHOOLS
   BOYCE ELEMENTARY
   D.G. COOLEY ELEMENTARY

FREDERICK COUNTY PUBLIC SCHOOLS
   APPLE PIE RIDGE ELEMENTARY
   ARMEL ELEMENTARY
   GAINESBORO ELEMENTARY
   GREENWOOD MILL ELEMENTARY
   INDIAN HOLLOW ELEMENTARY
   MIDDLETOWN ELEMENTARY
   REDBUD RUN ELEMENTARY

INDEPENDENT
   INDEPENDENT SCHOOL OF WINCHESTER
   MOUNTAIN VIEW CHRISTIAN ACADEMY

RANDOLPH-MACON ACADEMY
   SACRED HEART ACADEMY

SHENANDOAH COUNTY PUBLIC SCHOOLS
   SANDY HOOK ELEMENTARY

WINCHESTER PUBLIC SCHOOLS
   DANIEL MORGAN INTERMEDIATE

WEST VIRGINIA

CHARLESTON

STARBASE West Virginia - Charleston*
   Service Component: National Guard
   Military Location: McLaughlin ANGB
   Address: 1679 Coonskin Drive
   Charleston, West Virginia 25311
   Tel: 304-341-6440
   Director: Robin Barnette
   Email: usaf.wv.130-aw.list.starbase@mail.mil
   Website: www.wvstarbase.org

KANAWHA COUNTY
   ALBAN ELEMENTARY
   ALUM CREEK ELEMENTARY
   ANDREW HEIGHTS ELEMENTARY
   ANNE BAILEY ELEMENTARY
   BELLE ELEMENTARY
   BRIDGEVIEW ELEMENTARY
   CEDAR GROVE ELEMENTARY
   CENTRAL ELEMENTARY
   CHESAPEAKE ELEMENTARY
   DUNBAR INTERMEDIATE
   GRANDVIEW ELEMENTARY
   KENNA ELEMENTARY
   MALDEN ELEMENTARY
   MARMET ELEMENTARY
   MARY C. SNOW WEST SIDE ELEMENTARY
   MARY INGLES ELEMENTARY
   MIDLAND TRAIL ELEMENTARY
   NITRO ELEMENTARY
   OVERLOOK ELEMENTARY
   PIEDMONT YEAR-ROUND EDUCATION
   POINT HARMONY ELEMENTARY
   PRATT ELEMENTARY

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
RICHMOND ELEMENTARY
RUFFNER ELEMENTARY
RUTHLAWN ELEMENTARY
SHARON DAWES ELEMENTARY
SHOALS ELEMENTARY
SISSONVILLE MIDDLE
WEBERWOOD ELEMENTARY

PUTNAM COUNTY PUBLIC SCHOOLS
POCA ELEMENTARY

MARTINSBURG

STARBASE Martinsburg*
Service Component: National Guard
Military Location: 167th Airlift Wing
Address: 222 Sabre Jet Boulevard
Martinsburg, West Virginia 25405
Tel: 304-616-5501
Director: Sherra Triggs
Email: usaf.wv.167-aw.list.starbase@mail.mil
Website: www.starbasemartinsburg.webs.com

BERKELEY COUNTY PUBLIC SCHOOLS
EAGLE SCHOOL INTERMEDIATE
FAITH CHRISTIAN ACADEMY
MILL CREEK INTERMEDIATE
MOUNTAIN RIDGE INTERMEDIATE
ORCHARD VIEW INTERMEDIATE
POTOMACK INTERMEDIATE
ST. JOSEPH SCHOOL
TOMAHAWK INTERMEDIATE

JEFFERSON COUNTY PUBLIC SCHOOLS
BLUE RIDGE ELEMENTARY
C.W. SHIPLEY ELEMENTARY
DRISWOOD ELEMENTARY
NORTH JEFFERSON ELEMENTARY
RANSON ELEMENTARY
SHEPHERDSTOWN ELEMENTARY
SOUTH JEFFERSON ELEMENTARY
T.A. LOWERY ELEMENTARY
WRIGHT DENNY INTERMEDIATE

WISCONSIN

MILWAUKEE

STARBASE Wisconsin
Service Component: National Guard
Military Location: U.S. Army Reserve Center
Address: 5130 W. Silver Spring Drive
Milwaukee, Wisconsin 53218
Tel: 414-535-5786
Director: John W. Puttre
Email: director@starbasewi.org
Website: http://dma.wi.gov/DMA/Starbase

MILWAUKEE PUBLIC SCHOOLS
ACADEMIA DE LENGUAJE Y BELLAS ARTES
ALEXANDER MITCHELL INTEGRATED ARTS
CASS STREET
CONGRESS
DOWNTOWN MONTESSORI
EIGHTY FIRST STREET
FAIRVIEW
GOLDA MIER
HARTFORD UNIVERSITY
HAWLEY ENVIRONMENTAL
HOPKINS LLOYD COMMUNITY
HUMBOLDT PARK
H.W. LONGFELLOW
JACKSON
JOHN GREENLEAF WHITTER
LINCOLN AVENUE
MARY MCLAUD BETHUNE ACADEMY
MORGANDALE
RICHARD KLUGE
SAMUEL CLEMENS
STARMS DISCOVERY
U.S. GRANT

*Indicates location also coordinates a DoD STARBASE 2.0 Program.
WYOMING

CHEYENNE

Wyoming STARBASE Academy
Service Component: National Guard
Military Location: Wyoming National Guard
Address: 5410 Bishop Boulevard
Cheyenne, Wyoming 82009
Tel: 307-777-8191
Director: Germaletta Brown
Email: starbase-academy@wyo.gov
Website: starbase.wyo.gov

ALBANY COUNTY
ALBANY COUNTY ELEMENTARY

HOMESCHOOL
HOMESCHOOL

LARAMIE COUNTY SCHOOL DISTRICT #1
AFFLERBACH ELEMENTARY
ALTA VISTA ELEMENTARY
ARP ELEMENTARY
BAIN ELEMENTARY
BAGGS ELEMENTARY
DAVIS ELEMENTARY
FAIRVIEW ELEMENTARY
FREEDOM ELEMENTARY
GILCHRIST ELEMENTARY
GOINS ELEMENTARY
HENDERSON ELEMENTARY
HEBARD ELMNETARY
HOBBES ELEMENTARY
JESSUP ELEMENTARY
MEADOWLARK ELEMENTARY
MILLER ELEMENTARY
PIONEER PARK ELEMENTARY
ROSSMAN ELEMENTARY
SUNRISE ELEMENTARY

LARAMIE COUNTY SCHOOL DISTRICT #2
ALBIN ELEMENTARY
BURNS ELEMENTARY
CARPENTER ELEMENTARY
PINE BLUFF ELEMENTARY
“I had an enjoyable time observing the class learning Newton’s Laws, creating and launching their rockets. I enjoy science and STEM is an awesome experience which all children need. STEM programs are ways to encourage our children to develop and dream of jobs in various technological areas. They can have them with proper preparation.”

– JOAN WASHINGTON, GRANDPARENT OF A STUDENT AT MERRILLVILLE INTERMEDIATE SCHOOL, ATTENDING STARBASE INDIANA-GARY
For more information contact:

Office of the Assistant Secretary of Defense/Reserve Affairs (OASD/M&RA)
1500 Defense Pentagon
Washington, DC 20301-1500
Phone: 703.693.8630

www.DoDSTARBASE.org