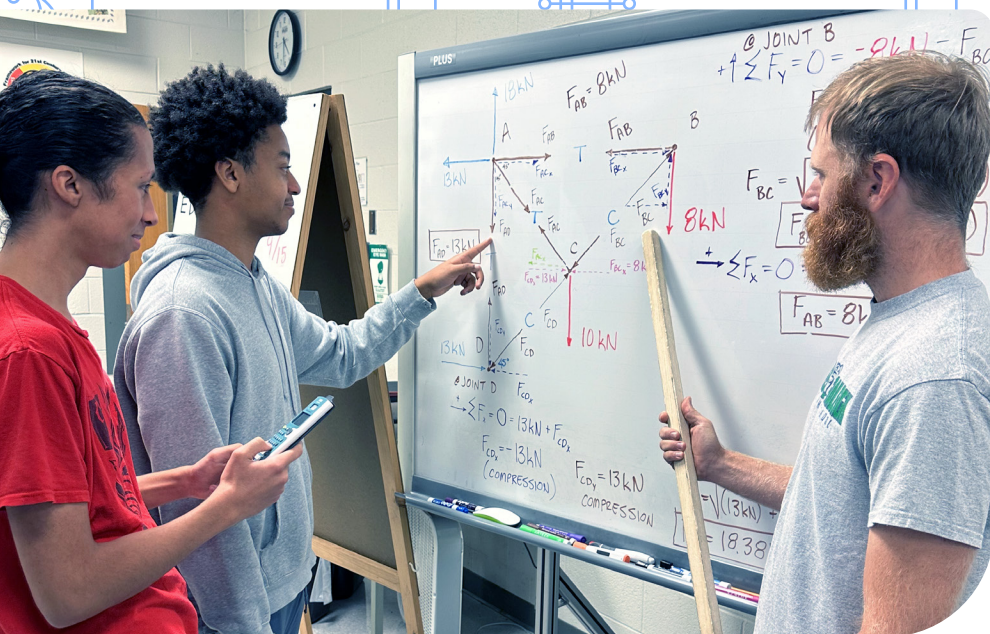


# NAF + PLTW

**A RECIPE FOR EDUCATOR  
ENGAGEMENT AND POWERFUL  
STUDENT LEARNING**

NAF

PLTW



Educators today face unprecedented challenges. As schools recover from the pandemic, teachers are working to address losses in academic and social emotional skills, as well as decreased student engagement.<sup>1</sup> At the same time, the advent of artificial intelligence, federal investments in high-tech manufacturing, and increased attention to shortages in STEM<sup>2</sup> talent has heightened the need to educate students for the workforce ahead.

**NAF and Project Lead The Way (PLTW) are national education nonprofits dedicated to supporting educators in meeting these challenges.**

Both organizations are committed to transforming student learning and preparing students for college and career.

**NAF**

**NAF supports small learning communities comprised of 619 career academies** in high schools across the country. NAF equips educators with career-relevant curricula, supports connections to community and business leaders, and provides the tools needed to establish high-quality and meaningful work-based learning experiences for students.

**PLTW**

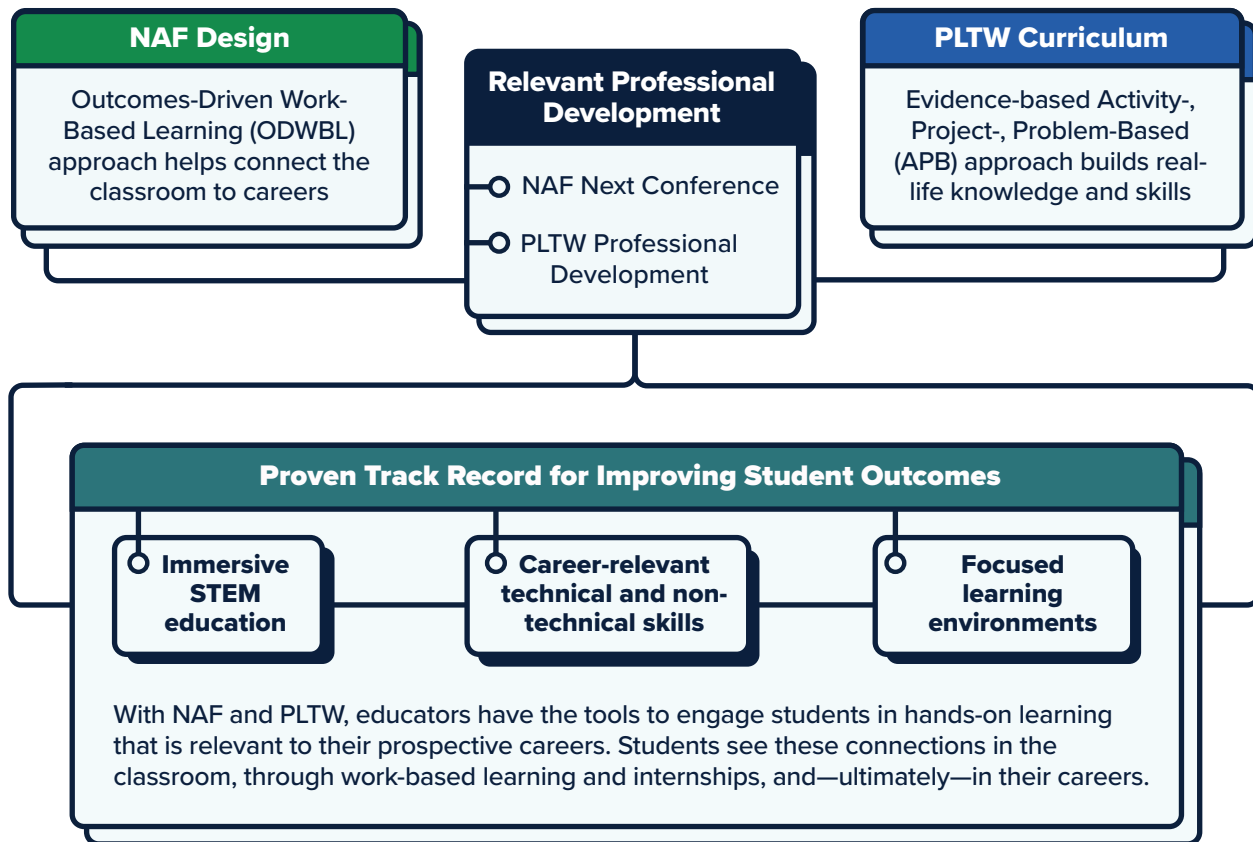
**PLTW transforms learning by providing educators in nearly 13,000 PreK-12 schools with classroom-ready STEM curricula.** PLTW's curricula is informed by industry partners and engages students in hands-on, career-connected learning. PLTW also empowers educators with its Core Training professional development and through Professional Development Suite courses that cover relevant education topics.

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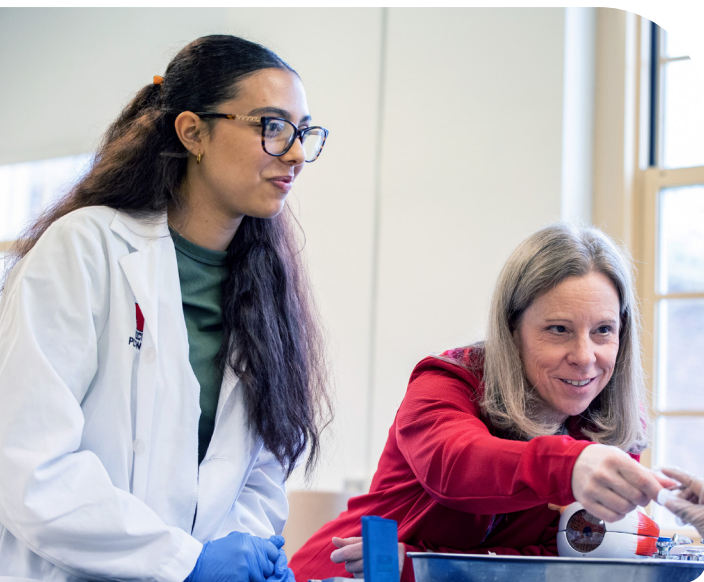
<sup>1</sup> CRPE, 2023; Malkus, 2024

<sup>2</sup> STEM refers to science, technology, engineering and math

## NAF + PLTW: A RECIPE FOR SUCCESS



NAF and PLTW each have decades of experience supporting educators and students, with proven results. So when NAF and PLTW come together in one learning community, educators get a recipe for even greater success. Currently 144 schools combine the power of NAF and PLTW. **Educators at four of those schools shared a story of how combining NAF and PLTW provides their schools with the ingredients for educator engagement and success, which in turn strengthens student engagement and future readiness.**




"[NAF and PLTW are] both great programs, but I see how having them together strengthens them, especially watching the students progress.... I just think the marriage of the two strengthens the program and better prepares our students for post-secondary life."


*Donzella Hartwill, PLTW Teacher  
Calvin Coolidge High School  
NAF Academy of Health Sciences*

## NAF + PLTW: PROVEN RESULTS


Studies conducted by third-party researchers demonstrate the positive impacts of both NAF and PLTW on student outcomes.




Large positive impacts on math, ELA, and science achievement for PLTW middle and high school students



Significantly higher emotional engagement for NAF students



15% point higher college enrollment and 13% point increase in STEM majors for PLTW students



Better high school graduation rates among students

○ **NAF** +6% points | At Risk +10% points

○ **PLTW** +7% points | Underrepresented +9-10% points

Camburn, et al., 2022; Fletcher et al., 2020;  
One8 Foundation & Papay, 2019; Sun & Spinney, 2017

## INGREDIENTS FOR EDUCATOR SUCCESS

The United States faces a perennial STEM teacher shortage.<sup>3</sup> Combined with news headlines about teacher burnout and challenges with teacher retention, the STEM teaching roles at NAF academies and in PLTW classrooms could be among the most difficult positions to fill.

However, the educators at the four schools we spoke with painted a different picture—one of job satisfaction, professional growth, and a strong commitment to remaining in the classroom.

**As Calvin Jackson, a PLTW teacher at Hawthorne High School, NAF Academy of Health Sciences commented, “[Teachers] don’t leave teaching Project Lead The Way and NAF. You just don’t do that.”**

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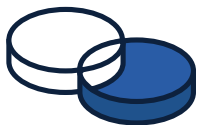
<sup>3</sup> Jones, A., 2023



**Teachers attributed their professional satisfaction to NAF's and PLTW's complementary approaches and supports, which elevate their teaching practices.** The result is a learning environment where teachers can deliver high-quality instruction through a well-established, hands-on curriculum, engage alongside their students in work-based learning through industry connections, and benefit from two organizations that are experts in educator professional development.

“Teaching is a difficult profession, and personal satisfaction can sometimes be difficult to actually attain. But I can say this; that the teachers in the Project Lead The Way side that engage in the NAF side—for me personally, it is more self-fulfilling. It is more gratifying. I tend to enjoy what I do more because it's a variety of functions.”

*Calvin Jackson, PLTW Teacher  
Hawthorne High School  
NAF Academy of Health Sciences*



## INGREDIENT ONE: PLTW Curriculum

*Evidence-based instructional approach that's flexible to implement*

Educators in the profiled schools noted that PLTW's curriculum is ready to teach as-is, providing a structure that allows new teachers to jump in quickly, fosters collaboration across colleagues, and helps administrators support their teachers. As Caitlyn Pauley, a PLTW teacher at Hawthorne stated: **"[PLTW] gives us everything we need... having a complete layout of exactly what we need to do, what the students need to do. It's perfect."**

Educators also noted that PLTW's curriculum is flexible, allowing them to customize it to their local context and industries. "I've taken that curriculum and I've got it all based on Raleigh, NC," described Jacob Griffin, PLTW teacher at

Southeast Raleigh High School, NAF Academy of Engineering, "I've tried to make it a little bit more local so that if they do enter the industry, whether right out of high school or go to a local college and they work locally, it really carries over." Griffin and Antonio Barnes, a fellow PLTW teacher at Southeast Raleigh, also noted that **the rigor of the PLTW curriculum and its connections to industry standards prepare students for their internships and post-secondary opportunities.**

**"[PLTW's curriculum] is like an awesome road map to kind of know where I'm going and where I'm supposed to be."**

*Jacob Griffin, PLTW Teacher  
Southeast Raleigh High School  
NAF Academy of Engineering*



## NAF

## WORK-BASED

## LEARNING

## EXPERIENCES

90%

of students at the profiled academies who participated in work-based learning said the experience helped them identify and build career skills.

75%

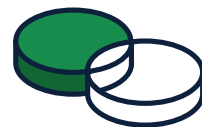
of seniors at the profiled academies indicate they have met an adult or older peer that does the type of work they are interested in.

63%

of seniors at the profiled academies completed a NAF internship of at least 80 hours.

## INGREDIENT TWO: NAF Design

*Work-based learning experiences  
and industry connections*



NAF's Outcomes-Driven Work-Based Learning (ODWBL) approach focuses on students' aspirations, skills, and career connections. With ODWBL, teachers and school leaders utilize a suite of tools for planning work-based learning experiences, engaging community and business partners in their Advisory Board, and tracking student engagement and progress.

**These structures allow teachers to extend students'—and their own—learning beyond the classroom.**

"...as impactful as it is on our students, it's probably as impactful on teachers," says Taylah Hawks, a PLTW teacher at Calvin Coolidge High School, NAF Academy of Health Sciences. "[Being a NAF academy] helps with student retention, student engagement—and then it definitely parallels as a teacher."

2023 NAF Student Survey responses from the profiled academies.



Hawks also shared how the work-based learning experiences impact her engagement as a teacher, “I think because of the NAF recommendation I’m more of a proponent of [worksite tours]... because they’re so beneficial and the students really just enjoy it. And it opens my mind up as an educator, too, and pushes me. Because you know, science is always changing; there’s always new things. So, it’s great to have [NAF and PLTW] coupled together.”

“... Students got a richer experience [with NAF in the school] because we were very focused on getting more industry exposure for the students. Both the internships and just even having experts come in and talk to them, it’s been invaluable.”

**Ken Lesley**  
NAF Academy Director  
McKinley Tech High School





## INGREDIENT THREE: Professional Development

*Teacher training that creates connections and builds efficacy*

Relevance and usefulness are key components of effective professional development that contribute to teacher satisfaction and retention.<sup>4</sup> As Hawthorne PLTW teacher Calvin Jackson reflected, “We get other... professional development. We get that a lot and it is good. **But the training we get from Project Lead The Way and from NAF is... more substantive for what we’re teaching.**”

All PLTW teachers take PLTW Core Training, which is led by experienced PLTW teachers and designed to provide teachers with the same creative, hands-on learning as their students. “[PLTW Core Training] is exactly what we’re teaching to our students,” said Hawthorne PLTW teacher Caitlyn Pauley.

“The training that we get from Project Lead The Way is second to none when it comes down to what we’re going to have to do and what we’re going to expect inside our classrooms when we teach the actual course material to the students.”

*Calvin Jackson, PLTW Teacher  
Hawthorne High School  
NAF Academy of Health Sciences*

Teachers can also access relevant resources and connect with other PLTW educators through PLTW’s online platform, myPLTW, and can extend their learning through PLTW’s Professional Development Suite courses. The organization also hosts its biennial PLTW Summit conference where teachers can connect with each other, connect with industry partners, and deepen their engagement with PLTW.

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<sup>4</sup> Ingersoll & May, 2010; Sims, 2017

NAF hosts its annual NAF Next conference, a professional development opportunity which typically brings together over 900 educators, and business and community leaders to share ideas on improving student learning experiences and outcomes. **“I went to every one of them, every one of their training sessions,” said Jackson of the NAF Next conference. “I was just enthralled by what I was learning and how they fit into the community.”**

Jackson also provided an example of how NAF Next changed his teaching practice, “Because at NAF we had conferences specifically about, for instance, our Latinx

population and how to engage our Latinx population. Specifically, I was able to attend training there and came back and instantly did what I was shown how to do... And I see those students participating readily now... More of those particular students are engaged.” Because of the information shared at NAF Next, Hawthorne is seeing “more and more [students] engaging in furthering their education now, more and more of them are going towards STEM education,” according to Jackson.

As Jackson noted, **student success is the best evidence that the combined implementation of NAF and PLTW enables educators to excel.**

## THE POWER OF PROFESSIONAL DEVELOPMENT

- 94% of NAF Next attendees were satisfied or very satisfied with their learning experience
- 85% of NAF Next attendees agreed or strongly agreed it provided actionable steps and tools to address work-related challenges


- >85% of PLTW teachers are confident using PLTW instructional approaches
- 74% of PLTW teachers said PLTW Core Training made them more effective as a teacher

# EDUCATOR SUCCESS LEADS TO STUDENT ENGAGEMENT

Studies show that students feel engaged and connected to school when classroom instruction is relevant and hands-on.<sup>5</sup> **Educators in schools implementing both NAF and PLTW have the tools to create these engaging learning environments.**

“The student engagement piece is really, really critical,” shared Donzella Hartwill, PLTW teacher at Calvin Coolidge. “The kids actually see how what they’re learning in class and the activities they’re doing make connections to their real life because there’s a lot of hands-on doing things.”

<sup>5</sup> Lucas Education Research, 2021




## SCHOOL SNAPSHOT


**CALVIN COOLIDGE HIGH SCHOOL**  
WASHINGTON, DC

### STUDENTS


**197** Enrolled in NAF Academy  
Free-Reduced Price Lunch: **>95%**  
English Learners: **30%**


### EDUCATORS

**3**   
with NAF or  
PLTW professional  
development

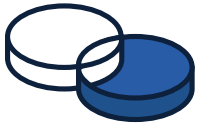
**2**   
actively  
teaching PLTW

### YEARS

**7** **IN NAF  
NETWORK**  
NAF Academy of  
Health Sciences 

**6** **USING PLTW  
CURRICULUM**  
PLTW Biomedical  
Science 

Fall 2023 NAF Quality Data Collection Cycle



## Teachers described **PLTW** instruction as relevant to students' lives and career choices.

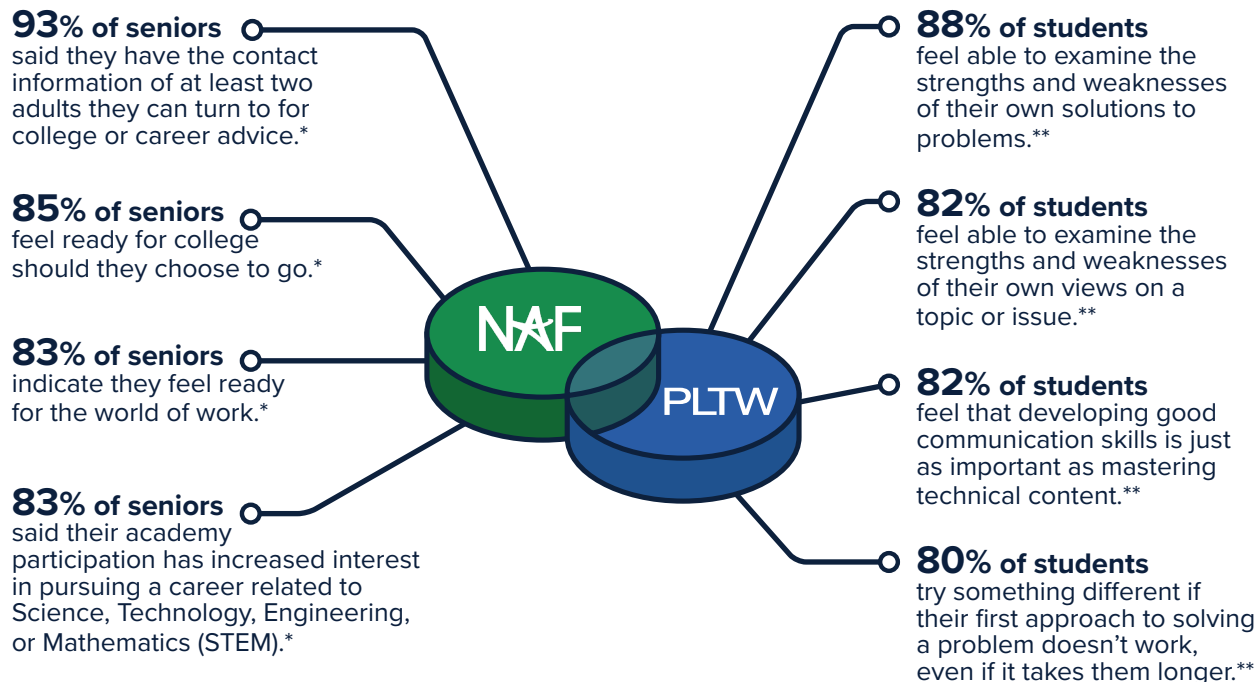
“It’s not just theory from the board but putting 3D projects together. It’s doing wet labs... as well as researching the professions that we’re discussing,” shared Calvin Jackson from Hawthorne. Jackson’s colleague Caitlyn Pauley added, **“PLTW really shows all of the different biomedical careers that students can get into so they can start to get an idea about what they want to do with their future.”**

Through activities with real-world applications and career profiles that feature individuals from a diversity of backgrounds, PLTW teachers help students discover their potential in STEM. These classroom experiences equip students with the knowledge they need to be successful in the workplace, as well as in internships established as part of NAF’s educational design.

As Ken Lesley, NAF Academy Director at McKinley Tech High School, reflected, “What I like about the Project Lead The Way curriculum is that it’s very project based. Students get a very good feel for the hands-on side of what engineering takes.” Calvin Coolidge PLTW teacher Taylah Hawks noted that PLTW’s curriculum “does a really good job of building on students’ soft skills.” Hawks credited those skills for helping students get into a NAF internship and for contributing to their success during the internship experience.



## STUDENTS IN THE FOUR PROFILED SCHOOLS SAY...



**80% of students indicate they find their academic coursework interesting and engaging.\***

\* 2023 NAF Student Survey responses from the profiled academies.

\*\* 2022-23 PLTW End-of-Course Assessment survey responses from the profiled academies.



**NAF's continuum of work-based learning experiences boosts student engagement and helps connect PLTW classroom instruction to real life.**

Ken Lesley, NAF Academy Director at McKinley Tech noted the value of “layering” NAF’s WBL experiences with students’ classroom learning. These experiences are “getting [students] out into industry and meeting with industry representatives,” according to Lesley.

“They get to go to these dental offices and talk to the dentist and see the extractions, see what the radiologist is doing,” explained Calvin Jackson from Hawthorne, “So that adds to the value of what we’re teaching because they understand how what they’re learning in the classroom will actually benefit them and how they’re trying to get to what they want to do in the future.”



## SCHOOL SNAPSHOT

### MCKINLEY TECHNOLOGY HIGH SCHOOL

WASHINGTON, DC

#### STUDENTS

**382** Enrolled in NAF Academy  
Free-Reduced Price Lunch: **>95%**  
English Learners: **2%**

#### EDUCATORS

**7**   
with NAF or  
PLTW professional  
development

**4**   
actively  
teaching PLTW

#### YEARS

**10** **IN NAF NETWORK**

NAF Academy  
of Engineering



NAF Academy  
of Information  
Technology



**16** **USING PLTW CURRICULUM**

PLTW  
Engineering



PLTW  
Computer Science



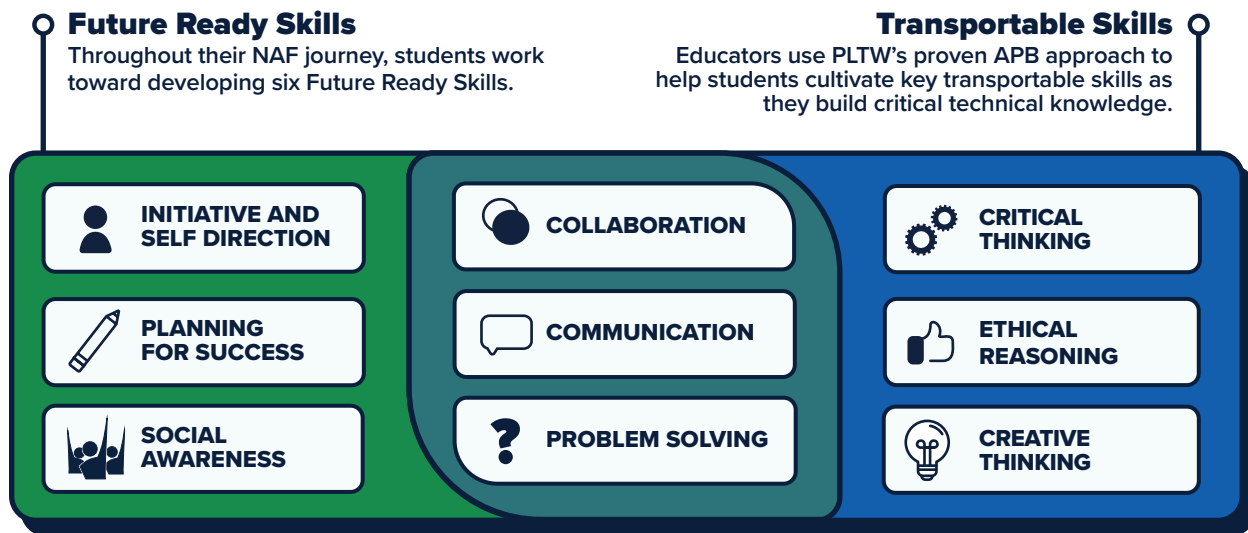
Fall 2023 NAF Quality Data Collection Cycle



Donzella Hartwill, PLTW teacher at Calvin Coolidge, noted that, “**hearing industry professionals talk about [careers], going to different work sites... helps [students] really get engaged and connected and invested in the curriculum.**”

Katrina Robinson, NAF Academy Manager at McKinley Tech reflected that, “There is a big difference working with students that have NAF ingrained within the school day... they are exposed to a lot of different things, they’re exposed to more. There are a lot more opportunities for them to take part of, to be engaged in.”

## NAF + PLTW: BUILDING SKILLS FOR COLLEGE AND CAREER





## **Students apply and refine the technical and non-technical skills they learn in the classroom during internships established with NAF's guidance.**

Internships deepen students' engagement in school by providing them an opportunity to apply classroom learning in professional settings. McKinley Tech's Ken Lesley observed that students are, "integrating and synthesizing what they learn in class and putting that towards their actual work experiences."

"NAF wants the students to have real world experiences, and the Project Lead The Way courses prepare them for the internships that we're able to get them into," explained Hawthorne's Calvin Jackson, "There's always a problem for them to solve. Those problems relate to real world functions and things that they will have to be engaged in when it comes down to the internships."

"And during COVID our students were right there assisting the staff that were coming from the health department, who would come out and offer the inoculations, the vaccinations... So when we're teaching about vaccines... How much MORE real can you get?... This is applied science and that's what teaching Project Lead The Way with the lean on NAF is."

*Calvin Jackson, PLTW Teacher  
Hawthorne High School  
NAF Academy of Health  
Sciences*



## SCHOOL SNAPSHOT

### HAWTHORNE ACADEMY OF HEALTH SCIENCES

CHARLOTTE, NC

#### STUDENTS

**227** Enrolled in NAF Academy

Free-Reduced Price Lunch: **>95%**

English Learners: **12%**

#### EDUCATORS

**4**

with NAF or  
PLTW professional  
development

**3**

actively  
teaching PLTW

#### YEARS

**10** IN NAF  
NETWORK

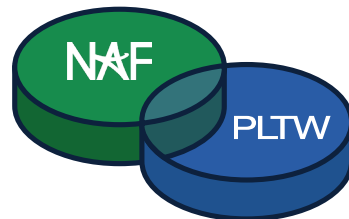
NAF Academy of  
Health Sciences 

**11** USING PLTW  
CURRICULUM

PLTW Biomedical  
Science 

Fall 2023 NAF Quality Data Collection Cycle

## NAF + PLTW = SUCCESS FOR ALL STUDENTS



NAF's continuum of work-based learning experiences in thriving career industries, combined with PLTW's career-focused curriculum, strengthens industry connections and **ensures students are well-positioned for whichever path they choose, whether that is college or career opportunities.**

Hawthorne's Calvin Jackson reflected, "The typical high school without these programs don't have these relationships—professional relationships in the community—and the students do not get the relationships that we get to build with them as we work toward ensuring that they are prepared for the internships." The result, Jackson explained, is "the major corporations coming to us for our students. Most of the time you'd have to go to them. But they actually come to us for our students."

## Teachers shared multiple stories of how the combination of NAF and PLTW put students on a successful path after high school.

○ “There’s just a ton of success stories—a ton of awesome internships,” said Southeast Raleigh’s Jacob Griffin. “One student had an internship with the Natural Science Center downtown, working on underwater robotics... And he’s now at State for mechanical engineering, staying in the robotics realm and just loves it.”

○ According to McKinley Tech’s Ken Lesley, “[Students] can go to college and not have to worry about imposter syndrome... I mean I’ve talked to a number of my alumni who go into college and are like ‘oh, I’ve already done CAD.’”

○ Katrina Robinson, NAF Academy Manager at McKinley Tech, shared, “[Going on college visits] is when I’m seeing that [students’] confidence is boosted because they’re realizing, ‘Oh, I can do some of this because I’m learning it now and it’s not as scary and it’s not as hard as I thought.’”

## Success stories weren't limited to students who attend college immediately after high school.

Antonio Barnes at Southeast Raleigh shared the story of a female graduate who was hired to work at a local employer after graduation and was so successful on her team that the employer supported her taking part-time college courses while working. That student isn't alone—a recent survey of over 600 NAF alumni indicates that **just over 1 in every 2 alumni that took the survey work while pursuing a postsecondary education.**

Another Southeast Raleigh student went into heavy equipment sales after graduation. “That’s what he wanted to do,” said Barnes, “But a year later, he came back to me and was like, ‘I wanna do what you used to do.’ And so I spoke to people at that company, and we got him into that company as an equipment operator. But since then, he’s worked up to be a crew superintendent and on his way to be a project manager.” Barnes added, **“And that company reaches out all the time like, ‘Do you have any more people like this?’”**



## SCHOOL SNAPSHOT

### SOUTHEAST RALEIGH MAGNET HIGH SCHOOL RALEIGH, NC

#### STUDENTS

**123** Enrolled in NAF Academy  
Free-Reduced Price Lunch: >95%  
English Learners: 17%



#### EDUCATORS

**4** with NAF or  
PLTW professional  
development

**3** actively  
teaching PLTW

#### YEARS

**10** IN NAF  
NETWORK  
NAF Academy  
of Engineering 

**19** USING PLTW  
CURRICULUM  
PLTW  
Computer Science   
PLTW  
Engineering 

Fall 2023 NAF Quality Data Collection Cycle

## **The complementary structures and supports of NAF and PLTW work in tandem to enable educators to foster success with all students.**

Calvin Coolidge's Assistant Principal Jamie Dawson explained how the **NAF small learning community and rigorous PLTW curriculum combine to create an environment that supports all students**, "The staff members are very connected to [students], so I think that students being in this program, it definitely benefits them and I think it provides something for them that a student who may not be in a NAF academy doesn't have... **even though there is a rigorous program, rarely do we have students who want to leave.**"

Coolidge High School's Principal Bright credited this holistic approach with improving their school's reputation and boosting enrollment. "Our story," Bright added, "is one that we've gone from 200 students to 1,000 students in five years... It's because of programs like [NAF and PLTW] that have allowed us to move the trajectory of our school."

"Everything we teach [are] things that they can do with their lives after they graduate... a lot of the students graduate and come back to our school to show the younger students what they're doing in their healthcare fields."

*Caitlyn Pauley  
PLTW Teacher  
Hawthorne High School  
NAF Academy of  
Health Sciences*

“I think as a leader of a comprehensive high school, it makes me know that we’re putting the best in front of our students and that’s what’s important, that they’re getting the best, most robust experience that they possibly can.”

*Principal Bright, Calvin Coolidge High School*

### NAF Academy Pathways



NAF Academy of Engineering



NAF Academy of Health Sciences



NAF Academy of Information Technology



NAF Academy of Finance



NAF Academy of Hospitality and Tourism

### PLTW Programs



PLTW Launch



PLTW Gateway



PLTW Algebra 1 Advantage



PLTW Biomedical Science



PLTW Computer Science



PLTW Engineering



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# EXPAND STEM AND CTE IN YOUR SCHOOL

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