

A photograph of three students in a laboratory setting. They are wearing light blue protective gowns, pink safety goggles, and face masks. The student on the right is also wearing blue gloves. They are gathered around a black lab bench, looking at a small orange object. The background shows lab equipment and a window.

PLTW

From Classrooms to Hospitals and Research Labs

Empowering students to succeed in the biomedical sciences with **Project Lead The Way**

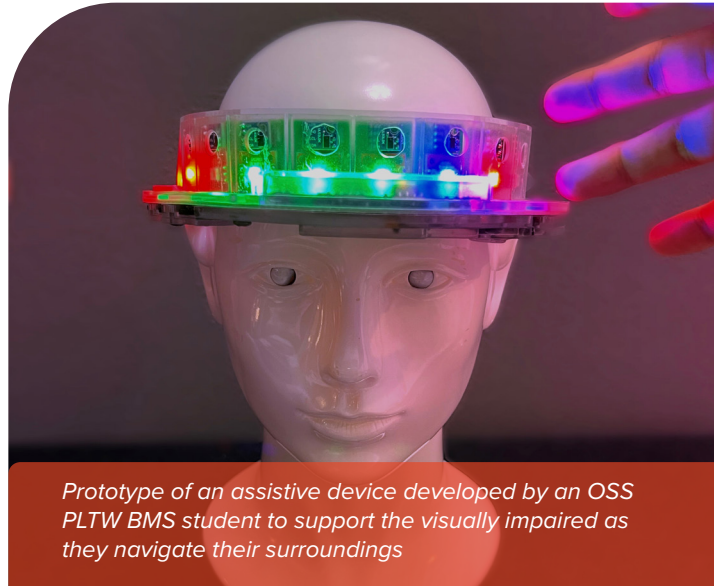
EMPOWERING STUDENTS

to thrive in an evolving world

According to the US Bureau of Labor Statistics, “[a]bout 1.8 million openings are projected each year,” in healthcare. This includes careers like dental assistants, nurses, medical assistants, pharmacists, surgeons, and veterinarians.¹ In schools that offer PLTW, students gain unique experiences that prepare them for success in post-secondary education and future careers.

“I went into the biomedical course expecting to integrate my passion for engineering with this newfound knowledge in medicine. I worked with the teacher of the PLTW program to develop a visual impairment device, so an assistive technology... And that was all because **I was able to use the knowledge I gained from PLTW [Biomedical Science]**, in addition to my existing knowledge from [PLTW Gateway] computer science, to produce a product that was really, truly interdisciplinary.

Essentially what the project did was it used LiDAR [Light Detection and Ranging] sensors to topographically map an area and then provide haptic feedback to the user through vibration. So, it was like an automated navigation system,” explained a PLTW Biomedical Science (BMS) senior from the Orlando Science School.



With the ever-increasing need for healthcare professionals, biomedical scientists, and biotechnologists, **the preparatory power of Project Lead The Way (PLTW) cannot be understated.** John Noll, principal of Elkhorn Crossing School, explains, “[PLTW] takes these students and provides them with a toolbox of different skills, both classroom skills and life skills, that I think really helps them be **successful both in the secondary level and within their career.**”

Compared to similar students in Texas who completed non-PLTW BMS classes, **PLTW BMS students are more likely to:**



Enroll in college (49%)



Major in STEM (32%)



Graduate with a Bachelor's (32%)²

GAIN A COMPETITIVE ADVANTAGE

with PLTW Biomedical Science

PLTW Courses

Principles of Biomedical Science
Human Body Systems
Medical Interventions
Biomedical Innovation
PLTW Capstone (Research Project)

Hands-On Learning

Post-Secondary Preparation

Career Readiness

Data Interpretation and Analysis

Advanced Lab Techniques

Clinical Skills

Elkhorn Crossing School (ECS) and Orlando Science School (OSS) are two schools that leverage the full PLTW BMS pathway to facilitate next-level learning experiences that connect the classroom to real life. **The hands-on curriculum gives students a strong foundation in biomedical science skills and prepares them to enter post-secondary education or start their career.**



“Having labs a lot also keeps me motivated because I get to come to class knowing I’m going to have fun being able to do something hands-on every day.”

Junior, ECS

ELKHORN CROSSING SCHOOL

Georgetown, KY



ECS is an **inquiry-based school where the lines between ‘technical’ and ‘academic’ are deliberately blurred.** All students will use technology to research, produce, and present across disciplines. Much of the class work will be project-based and apply to real world application.³

ECS students spend half of the school day at their “village” (i.e. area of focus). **As they progress through the program, PLTW BMS students:**



Are awarded stethoscopes and white coats



Participate in extensive research projects



Connect with an extensive alumni network

ORLANDO SCIENCE SCHOOLS

Orlando, FL



The mission of Orlando Science Schools is to provide students with a well-rounded education with special emphasis on Science, Technology, Engineering, Mathematics (STEM) and Reading in the light of research based, **proven and innovative instructional methods** in a stimulating environment.⁴

OSS students attend all classes at the STEM-focused public charter school. **As they progress through the program, students who choose PLTW BMS as an elective:**



Set yearly short- and long-term goals



Participate in extensive research projects

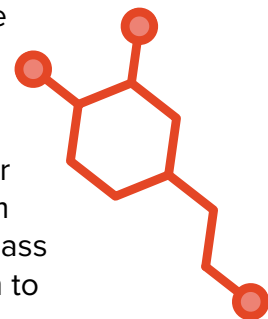
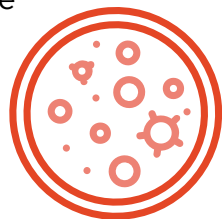


Receive preparation to sit for the Biotechnology Aptitude & Competency Exam

EMPOWERING STUDENTS

through hands-on learning

The strength of PLTW's BMS program begins with the hands-on learning embedded into the curriculum. "We had a different case that we had to solve, and we had to diagnose the person based on their symptoms and their MRI scans and heart scans," shared a freshman from OSS. An ECS sophomore similarly reported, "We're doing stuff that we maybe can do in college...so we're getting these hands-on experiences at a younger age." Students across both programs emphasized their hands-on experiences from the curriculum and other class projects that enabled them to explore personal interests.



"None of what we did was simulated, you're actually using the equipment, you're actually getting to see the tools and how [they] function."

Zachary Gregory, Alum, ECS

Next-Level Learning Opportunities

- Conducting independent research projects
- Authoring academic papers
- Delivering symposium presentations
- Participating in STEM extracurriculars



"We've seen a lot of the students that take the PLTW classes tend to excel in extracurriculars as well... they're...applying the knowledge. That's really benefited our academic clubs and competitions."

Nicholas Koebe, Principal, OSS



Top Skills Reported by OSS and ECS Students

Technical

- Polymerase Chain Reaction (PCR) skills
- Gel electrophoresis techniques
- Streaking
- Aseptic techniques
- Research skills
- Presentation skills

Transportable

- Communication
- Collaboration
- Problem Solving



"I think PLTW not only improved my collaborative skills, but also general research. Like now I know where to look for papers like PubMed and NCBI...and not only look through research papers, but also find the validity of websites whether they can be trusted or not, which I think is a really important aspect of research."

Freshman, OSS

"One of the really great things I think biomed brings to absolutely anybody... [are] those foundational skills that are crucial for critical thinking or communication."

Caitlin Battaglia, Alum, ECS

"I truly believe in the program and there's no better way of learning."

Judith Bright, PLTW BMS Teacher, OSS

EMPOWERING STUDENTS to realize their dreams

To welcome students into the biomedical field each year, **ECS freshmen and sophomores are celebrated during a stethoscope or white coat ceremony**, respectively. Julye Adams, PhD, PLTW Master Teacher, and BMS Teacher at ECS shared, "The White Coat and Stethoscope Ceremony is a pivotal moment for ECS Biomed students, symbolizing their commitment to the

"In my experience, I see students stand up straighter, speak with more confidence, and reinforce their love of science and caring for the community. They embrace that they can, and will need to do hard things... because the career they aspire to demands their best."

Julye Adams, PhD, PLTW Master Teacher



science profession and marking the beginning of their professional journey. It sets the tone for their academic and career preparation, **instilling a sense of pride and confidence as they transition from students to future healthcare providers, scientists, and bioengineers.**

At OSS, students grow in their confidence as biomedical scientists through opportunities that allow them to engage and contribute as members of the scientific community. A sophomore student shared,

“Last summer, I got invited to the National Congress of Future Medical Leaders... And I think it was a huge event with 3,000 or so kids, but I actually managed to talk to the founder of it, and he said, ‘we looked at your grades and extracurriculars’...But he also said **‘your PLTW record and especially the perfect score you got on the PLTW**



EOC really stood out for us, which is why we picked you.” The Congress of Future Medical Leaders is a prestigious program for high school students who aim to work in medicine and the medical science field. During the program, students meet with and learn from prominent researchers, scientists, and practitioners.⁵



“Getting my stethoscope and white coat made me feel like a real scientist.”

PLTW Student, ECS

“Having...girls on STEM paths, having each other as [role] models...I think gives the students a lot of confidence in the classroom.”

Nicholas Koebe, Principal, OSS

EMPOWERING STUDENTS *through career connections*



Internships, certification opportunities, and career paths highlighted in the PLTW BMS curriculum give students a deep understanding of the biomedical sciences. With PLTW, **“you’re getting the chance to learn all these things and put yourself into the shoes of medical professionals or engineers or biomedical scientists and you really get to see a day in their life,”** said a junior at ECS.

These tangible connections help students understand the full breadth of careers in biomedical science.





According to a junior at OSS, “at the end of some of these lessons [we] talk about specific professions and then talk about the career path that you have to take for them, what the schooling is like, sometimes even what the pay is like, [and] the lifestyle...so, you’re really able to **get insight into what the career path would be going into this field.**”



This sometimes reinforces career decisions but also leads students to new interests, “at the beginning of my [PLTW] experience, I was 100% set on being a doctor... But as **I explored other careers through the curriculum...** there was someone that [worked in] pharmacy and pharmaceutical research. And as we were learning about that unit and I researched more into that career...**it showed me that there’s more careers in medicine or fields I’m interested in than what I previously thought.**”



“I’m such a proponent of project-based learning...I want everybody to know it all works together with cross curriculum. And you can be whatever you want to be and do whatever you want to do, as long as you have the willingness to do the work for it.”

Judith Bright, PLTW BMS Teacher, OSS



In addition to exposure to careers, students at OSS can prepare and sit for the **Biotechnology Aptitude and Competency Exam (BACE)**, “an industry-recognized exam offered by Biotility designed to assess core skills and knowledge sets defined by the bioscience industry.”⁶

A senior at OSS noted that PLTW contributed to their success, “**PLTW did kind of set me up for the BACE exam** because you do learn the preliminary lab techniques.” A junior at OSS described the credential as not only a benefit for career exploration, but also in terms of post-secondary preparation, “I got that [credential] and that was exciting because **now you have the opportunity to show off that credential and maybe put that to use in a laboratory** [during] college.”



10,600 jobs

available jobs per year

The job outlook for **Biological Technicians** is positive with faster than average growth. According to the US Bureau of Labor Statistics, “[a]bout 10,600 openings for biological technicians are projected each year, on average, over the decade.”⁷



Tanvi Ranade, an alum of the OSS BMS program and current dual major in bioengineering and computer science at Johns Hopkins University, similarly highlighted the preparatory power of the BACE certification, “it definitely gives you more credentials, [it shows] I know how to do the basic lab work.”

“I am part of a program at Johns Hopkins called Design Team. You’re given or you choose a clinical project to focus on and then you’re kind of innovating on it. So, I guess [PLTW] sets you a little bit [apart] because you know some of the previously existing technology, and that’s kind of why MI was also one of the reasons why I was interested in that program in the first place. So now I’ll be leading a team next year.”

Tanvi Ranade, Alum, OSS

OSS Students Exceed National Average

Biotechnology Aptitude and Competency Exam

65%
OSS

BACE Pass Rate
2023-24 School Year

54%
National⁸

among 38 candidates

TANVI RANADE’S PATHWAY

PLTW BMS
at OSS



BACE Exam



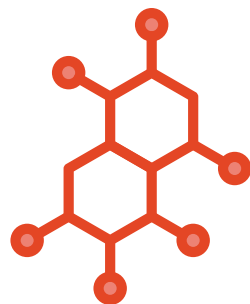
Johns Hopkins
University



EMPOWERING STUDENTS

through post-secondary preparation

Hands-on curriculum like PLTW's gives students the opportunity to **gain transportable and technical skills that position them for greater success** in the post-secondary space.⁹ "I just feel that [PLTW] has helped provide that rigor and the guidance for our [teachers] to... equip our students here with the skills that they need in post-secondary," noted the Principal at ECS. Zachary Gregory, an alum of ECS, experienced this during their first year of college, "when I rolled into my freshman anatomy and physiology classes I already had a good foundation...I think it greatly sets students up for success in college and on into the job market." And, a recent OSS graduate explained, "I am in a BSMD program... you get your BS degree... and you also get your MD degree...."



ZACHARY GREGORY'S PATHWAY

PLTW BMS
at ECS



Paramedic



Physician
Assistant



"I think PLTW did help me in my interviews for my BSMD because one of the things that they would ask me, 'is there any class that you did in high school that really helped you?' And me talking about **PLTW ... set me [apart] from the other applicants and that probably is one of the main reasons I got into the program.**"



PLTW students at these schools take an educational pathway that **uniquely prepares them for life after high school.** Through their implementation of the complete PLTW BMS program and unique approaches, both schools offer experiences that prepare students for the rigor of careers in the biomedical sciences in terms of content and transportable skills, while also building awareness of the many available paths.

ECS Students Exceed National Average

American College Testing

ACT Test Component	ECS BMS Average ACT Score	National Average ACT Score ¹⁰
ACT Composite	24	20
ACT English	24	19
ACT Mathematics	23	19
ACT Reading	26	21
ACT Science	24	20

SCHOOL DEMOGRAPHICS

ELKHORN CROSSING SCHOOL

GEORGETOWN, KY

FULL SCHOOL POPULATION¹¹

805 Students

57.9% Female
42.1% Male

2.6% African American
1.7% Asian

5.6% Hispanic or Latino
0.3% Other

2.6% Two or More Races
87.2% White

ORLANDO SCIENCE SCHOOL

ORLANDO, FL

FULL SCHOOL POPULATION¹²

1,453 Students

44.9% Female
55.1% Male

0.8% American Indian/
Alaskan Native
37.6% Asian

15.6% Black/
African American
22.3% Hispanic

3.2% Multiracial
0.4% Subgroups of
<10 Students

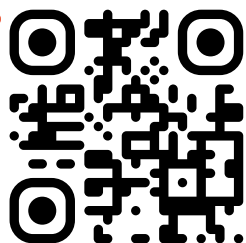
20.1% White

References

- ¹ U.S. Bureau of Labor Statistics. (2024a). Healthcare occupations. U.S. Bureau of Labor Statistics. <https://www.bls.gov/ooh/healthcare/home.htm>
- ² Post-Secondary Outcomes Among Texas Students in Project Lead The Way Courses. (n.d.-a). https://www.pltw.org/hubfs/PLTW_Brand/impact-profiles/PLTW_Texas_OnePager.pdf
- ³ ECS Course Guide 2024-2025. (n.d.-b).
- ⁴ About Us. OSS Main Campus. (n.d.-c). <https://orlandoscience.org/about-us/>
- ⁵ Home. National Academy of Future Physicians and Medical Scientists. (n.d.-e). <https://www.futuredocs.com/>
- ⁶ Biotechnician Assistant Credentialing Exam (BACE). Biotility. (2024, July 29). <https://biotility.research.ufl.edu/bace/>
- ⁷ U.S. Bureau of Labor Statistics. (2024b). Biological technicians. U.S. Bureau of Labor Statistics. <https://www.bls.gov/ooh/life-physical-and-social-science/biological-technicians.htm>
- ⁸ Mandell, T. (2024, October 3-5). Unlocking excitement: Introducing UF Biotility's free badging for enhanced opportunities with the BACE [Conference presentation]. PLTW Summit 2024, San Diego, CA, United States.
- ⁹ Burning Glass Technologies (2019). The power of transportable skills: Assessing the demand and value of the skills of the future.
- ¹⁰ National Ranks for English, Math, Reading, Science, Composite, and STEM Scores. ACT Test Scores: National Ranks. (n.d.-d). <https://www.act.org/content/act/en/products-and-services/the-act/scores/national-ranks.html>
- ¹¹ Elkhorn Crossing School. Kentucky School Report Card. (n.d.). https://www.kyschoolreportcard.com/organization/154870/school_overview/students/enrollment?year=2023
- ¹² 2023-24 ORLANDO SCIENCE MIDDLE HIGH CHARTER REPORT CARD. Florida Department of Education. (n.d.). <https://edudata.fldoe.org/ReportCards/Schools.html?school=0089&district=48>

***Create opportunities to explore, experiment,
and excel in biomedical science***

GET IN TOUCH



pltw.org/get-started

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