



- BUILDING THE BASE:
HOW WE BUILT A HIGH SCHOOL MEDICAL
LAB PROGRAM**
- September 10th, 2025**



Speaker Disclosures

We have no financial conflicts of interest to disclose.

Introductions

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UR | Labs
MEDICINE

Learning Objectives



At the conclusion of today you will know,

- **Learning Objective 1:** participants will be able to explain how engaging with high school students (especially in a skills-based program) can increase the exposure of the field and therefore increases the number of students who join the entry level workforce and/or go to college based medical laboratory programs.
- **Learning Objective 2:** participants will be able to effectively discuss with their staff how to create a high school medical laboratory assisting and phlebotomy program.
- **Learning Objective 3:** participants will be able to know how to effectively create advocates in their local community that can help spread knowledge of the importance of the medical laboratory.

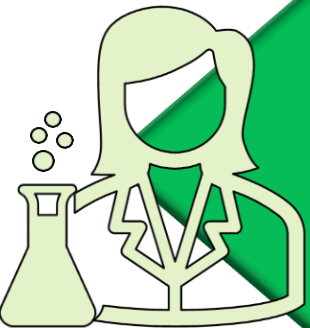


MEDICAL LABORATORY EMPLOYMENT CRISIS & HOW TO ADDRESS IT

Medical Laboratory In An Employment Crisis



Testing Testing Testing¹



Approximately 14 billion laboratory medicine tests annually in the U.S

Laboratory Careers Are Growing^{3,4,5}



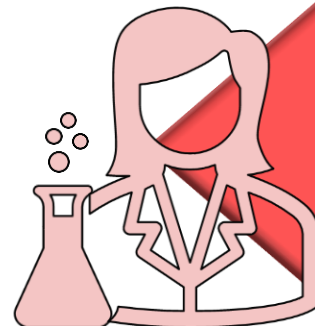
MLS/MLT will increase by 11 % by 2030

Average increase of 7% in all occupations

Stark Staffing Shortages²



Shortages of than 25% in 16 states

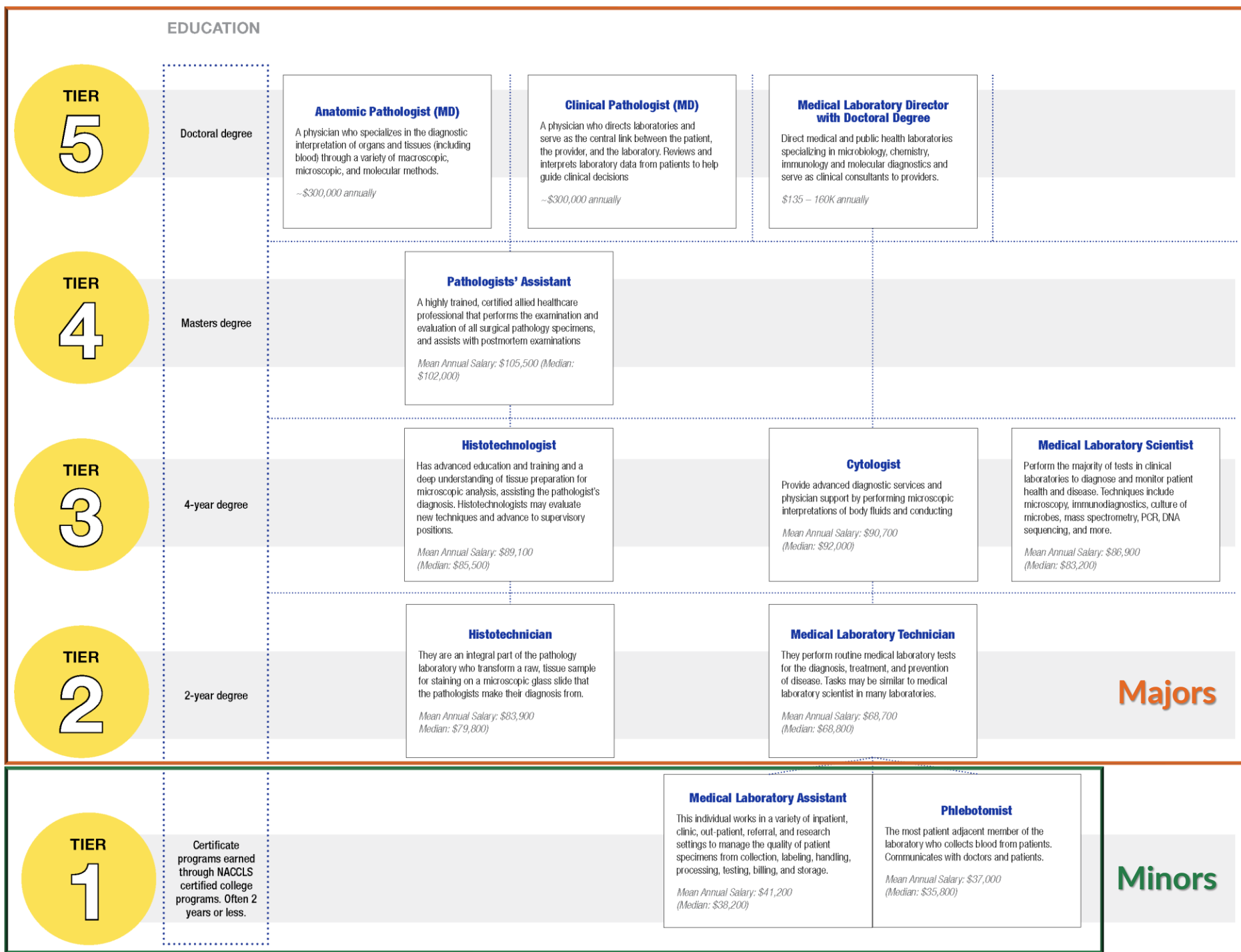


Almost 24,200 openings each year through 2030

In 2022 we produced 7,400 graduates

Join The Med Lab Baseball Team!

- Minor League Baseball
- The “Minor League” In The Lab



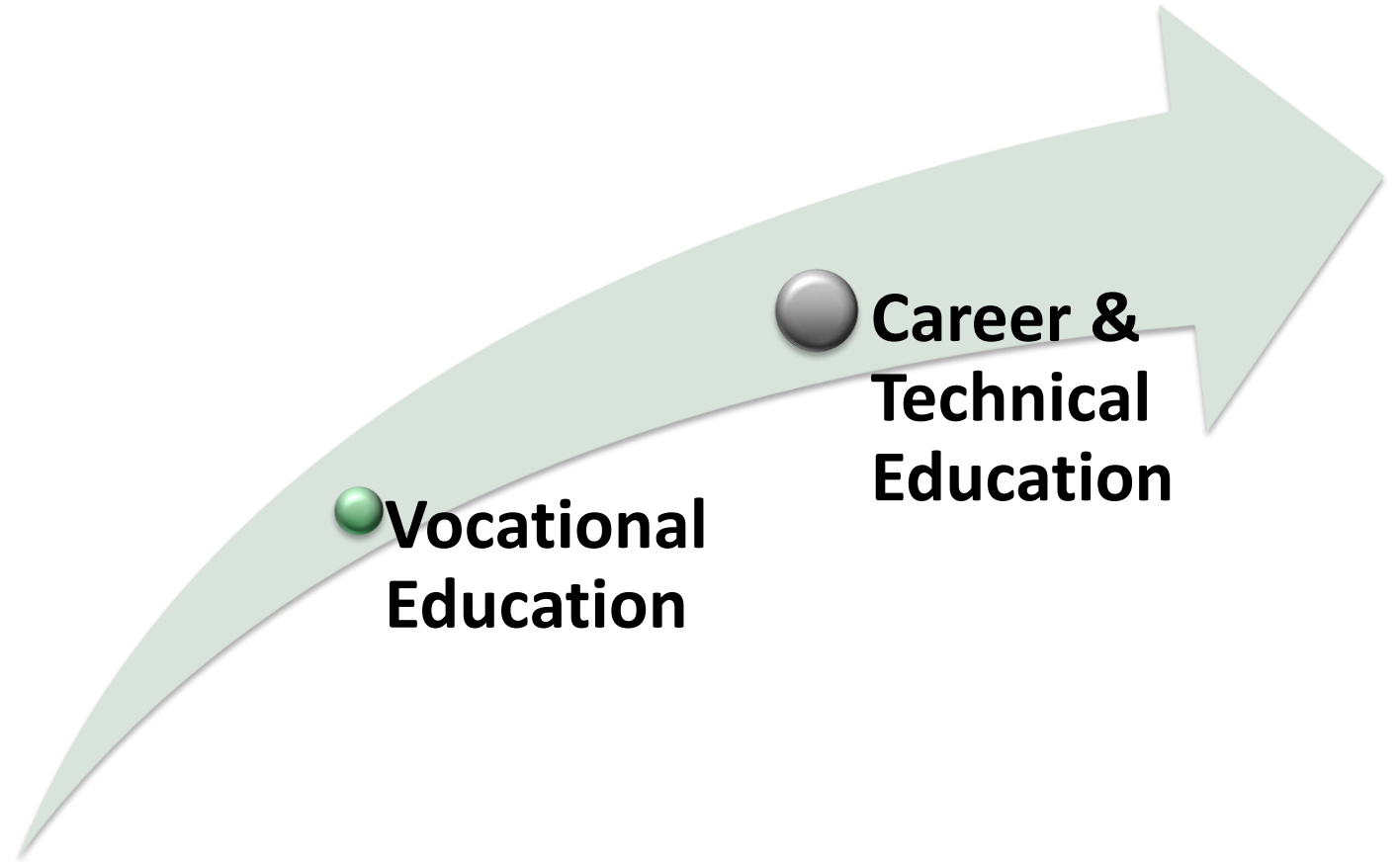
Majors

Minors



WHAT IS CAREER & TECHNICAL EDUCATION (CTE)?

What is Career & Technical Education (CTE)?



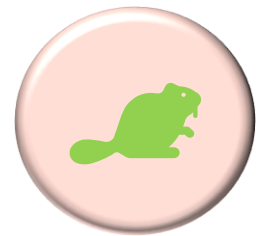
Today's Agenda



**High School Medical
Lab Program**



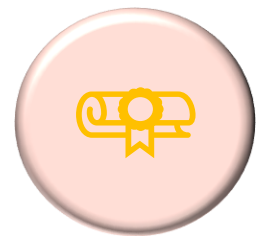
**Building
Advocates**



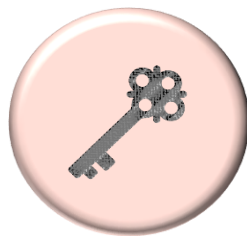
**Work-Based
Learning**



**Your Laboratory's
Role In Building A
Program**



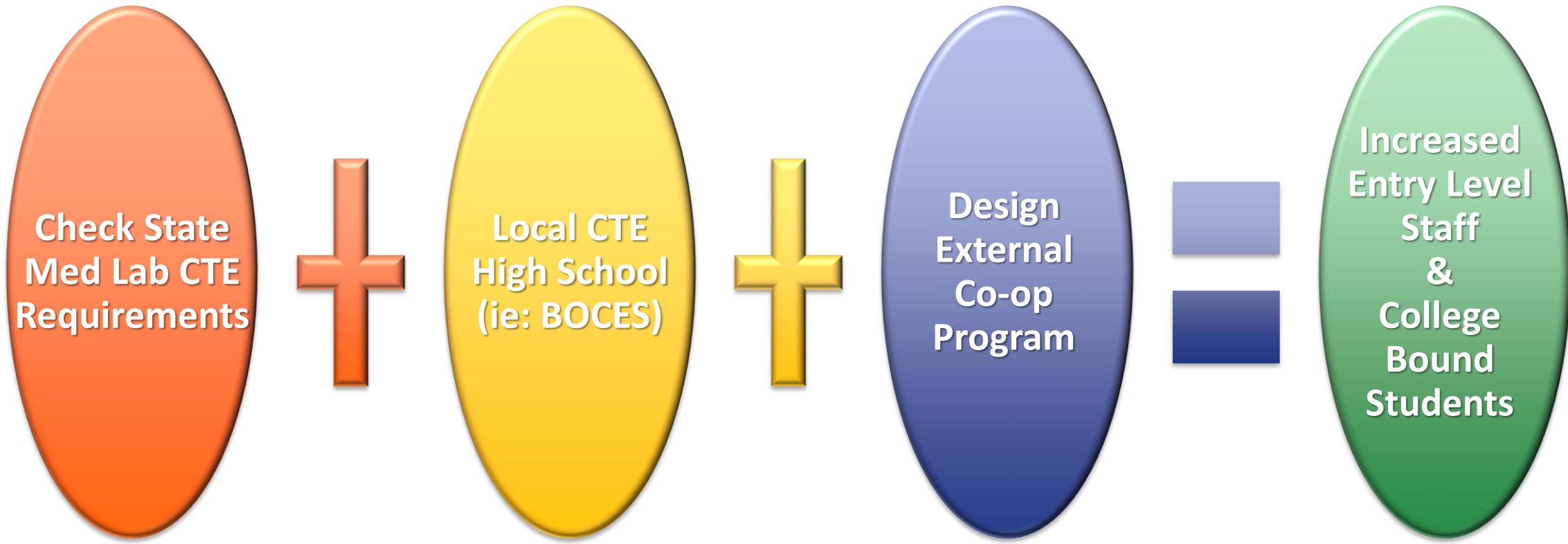
**College/Career
Ready**



**Med Lab Program
Keys To Success**



Creating A High School Program "Formula"





**WHAT DOES A HIGH
SCHOOL MEDICAL
LABORATORY PROGRAM
LOOK LIKE?**

Medical Lab Assisting & Phlebotomy Program

Program Objective:

To provide the education, training, real world experiences that prepares **high school students** for rewarding careers in laboratory medicine.



College Level Knowledge



Fundamentals

- 1,000 Medical Terminology Prefixes, Roots Suffixes
- Laboratory Safety
- Solution/Dilution Math
- Phlebotomy Theory
- A&P

College Level Content

- Hematology
- Immunology
- Microbiology
- Histology/Cytology
- Urinalysis
- Clinical Chemistry
- Genetics

Employability Profile



Ratings of Student's Employable Skills

- 1 = not skilled
- 2 = needs oversight
- 3 = independent
- 4 = passed practical on this skill

Medical Laboratory Assisting and Phlebotomy



Employability Profile

<p>Work-Related Skills</p> <p>Productivity and Accountability _____</p> <p>Follows procedures to meet expectations and deadlines _____</p> <p>Displays consistent work performance and quality of work _____</p> <p>Flexibility and Adaptability _____</p> <p>Works effectively in varied roles and responsibilities _____</p> <p>Responds well to and implements feedback _____</p> <p>Initiative and Self-Direction _____</p> <p>Identifies, prioritizes, and completes tasks without direct oversight _____</p> <p>Seeks to learn and develop new knowledge and skills _____</p> <p>Leadership and Responsibility _____</p> <p>Leverages strengths of others to accomplish a goal _____</p> <p>Takes ownership of one's work, performance, behavior, and actions _____</p> <p>Communication _____</p> <p>Articulates thoughts and ideas clearly and effectively through speaking and writing _____</p> <p>Practices active listening skills _____</p> <p>Collaboration _____</p> <p>Works effectively with others _____</p> <p>Open and responsive to new and diverse perspectives _____</p> <p>Critical Thinking and Problem Solving _____</p> <p>Asks questions to lead to better solutions _____</p> <p>Identifies possible options and their outcomes _____</p> <p>Customer Service & EMR Skills</p> <p>Demonstrate proper patient registration including demographics/insurance _____</p> <p>Demonstrate proper patient registration including demographics/insurance into electronic medical records database _____</p> <p>Demonstrate entering patient test results and creation of an invoice using electronic medical records database _____</p> <p>Data Analysis</p> <p>Create a data table in excel to organize and statically analyze data _____</p> <p>Use graph to show trends in data _____</p>	<p>General Laboratory Skills</p> <p>Demonstrate use of pH meter _____</p> <p>Demonstrate the ability to perform titration _____</p> <p>Demonstrate effective use of micropipettes _____</p> <p>Demonstrate how to use math to create solution for the laboratory _____</p> <p>Demonstrate ability to follow a detailed multi-step procedure with no errors _____</p> <p>Demonstrate ability to write and follow a standard operating procedure (SOP) _____</p> <p>Demonstrate effective use of serological pipettes _____</p> <p>Demonstrate maintaining laboratory notebook _____</p> <p>Demonstrate ability to perform serial dilution of a sample _____</p> <p>Demonstrate estimation of size of cells under a microscope _____</p> <p>Lab Safety & Infection Control Practices</p> <p>Implements infection control and safety practices _____</p> <p>Carry out preparation of a 10% bleach solution _____</p> <p>Interprets SDS and NFPA hazard rating into safe laboratory practice _____</p> <p>Complies with government mandated safety practices _____</p> <p>Lab Maintenance</p> <p>Demonstrate preparation of reagents _____</p> <p>Demonstrate maintenance of laboratory equipment _____</p> <p>Maintain control of inventory using electronic inventory database _____</p> <p>Ensure that supplies are stored appropriately _____</p> <p>Recognize and report contamination _____</p>	<p>Phlebotomy Skills</p> <p>Integrate OSHA bloodborne pathogen and needle stick safety into collection technique _____</p> <p>Use SOPs in proper collection and preservation and transportation of clinical lab samples _____</p> <p>Selection of blood tubes based on additives and requested tests _____</p> <p>Integration of common medical terminology into vocabulary _____</p> <p>Apply knowledge of anatomy & physiology to clinical lab samples _____</p> <p>Apply knowledge of types of blood samples to tube selection _____</p> <p>Demonstrate vital sign, blood pressure measurements _____</p> <p>Demonstrate venipuncture using different types of collection equipment _____</p> <p>Select appropriate & alternative sites for venipuncture _____</p> <p>Demonstrate dermal (capillary) puncture _____</p> <p>Demonstrates proper urine collection _____</p> <p>Specimen Processing</p> <p>Select samples that need to be rejected or recollected _____</p> <p>Demonstrate specimen processing and aliquoting _____</p> <p>Demonstrate usage of centrifuge and compound microscope _____</p> <p>Demonstrates how to maintain data integrity _____</p> <p>Legal & Ethical Responsibilities</p> <p>Demonstrates procedure for informed consent _____</p> <p>Demonstrates protecting PHI as described by HIPAA _____</p> <p>Demonstrate the patient identification process _____</p> <p>Demonstrate compliance with medical laboratory regulating agencies _____</p> <p>Demonstrate compliance with OSHA regulations for the laboratory _____</p>	<p>Genetic Testing Skills</p> <p>Carry out a polymerase chain reaction (PCR) protocol _____</p> <p>Carry out a restriction digestion protocol and analyze using DNA gel electrophoresis _____</p> <p>Generate a standard curve using DNA size standard and extrapolate results _____</p> <p>Urinalysis</p> <p>Perform physical & chemical examination of urine, using dipsticks _____</p> <p>Interpret results of urine examination _____</p> <p>Blood Testing</p> <p>Determine patient hematocrit _____</p> <p>Determine blood glucose using a POCT meter _____</p> <p>Perform POCT coagulation testing _____</p> <p>Demonstrate POCT blood type testing _____</p> <p>Demonstrate use of a comprehensive metabolic panel using POCT analyzer _____</p> <p>Microbiology</p> <p>Demonstrates proper isolation and aseptic technique _____</p> <p>Demonstrate basic microbiological staining _____</p> <p>Demonstrate biochemical tests using plate media, in tubes or on slides _____</p> <p>Demonstrate proper culturing of bacterial cells _____</p> <p>Demonstrate how to make and pour sterile media using an autoclave _____</p> <p>Demonstrate use of a spectrophotometer to determine cell concentration _____</p> <p>Demonstrate proper wet mounting of a sample onto a slide _____</p>
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Laboratory Skills We Teach



Fundamental Skills

- Microscopy
- Micropipetting
- Titration
- Spectrophotometry
- Venipuncture and Dermal Puncture
- Organic Chemistry Through Making Soap

Advanced Skills

- Blood Smears
- ELISA
- Bacterial Identification
 - Plates, Stains & Biochemical Tests
- Chemical & Microscopic Analysis of Urine
- POCT Clinical Chemistry Test
- Microtome Use
- H&E Staining
- Bioinformatics
- Molecular Cloning
- PCR
- Bacterial Transformation

NYS Medical Laboratory Program Requirements



- **Med Lab & Phlebotomy Program Components**
 - Suggested Certification Blueprint Organizations: American Medical Technologies (AMT), National Healthcareer Association (NHA), National Center for Competency Testing (NCCT)
- **Health Science Core Curriculum**
 - <https://healthscienceconsortium.org/standards/>
- **Supervised Clinical Experience (CO-OP)**
 - “Affiliation agreement(s) must be established (a written contract with partnering healthcare facilities)”
 - Must have 108 hours of clinical experience
- **Complete NYS Guide:**
 - <https://www.nysed.gov/career-technical-education/medical-laboratory-technology-assisting>

NYS Transitional A CTE Teacher Certification



- **Transitional A Certificate:**
 - “Individuals must have a commitment from a New York State school, school district, or BOCES to employ and mentor them while they complete the Initial certificate requirements”
 - **MLT or MLS Work Experience Required**





Career & Technical Education Certification Checklist: Transitional A Certificate

Trans A certificates are valid for three (3) years. During that time, CTE teachers complete the requirements for the Initial certificate.

How to Submit Official Transcripts to the NYSED's Office of Teaching Initiatives:
ctetac.us/3G4S4wi

Any documentation should be forwarded to:
tcert@nysed.gov

To access additional information and course offering dates, visit:
nyctecenter.org/train-sustain

Note: Additional workshops and clearances may be required to apply for a certificate dependent upon your education and work experience. It is best to reference the NYSED Certification Requirement Lookup Tool (ctetac.us/44kHdHy) for certainty.

nyctecenter.org

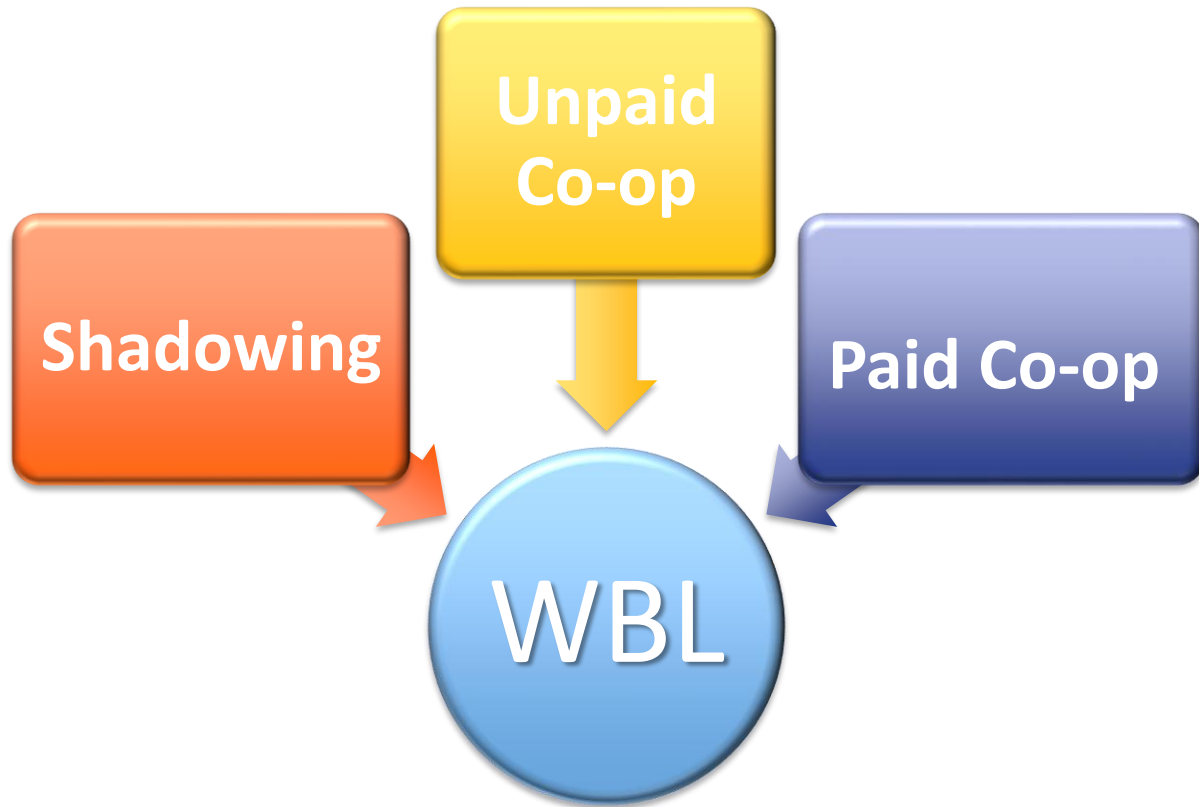
Checklist: **Must Complete
**If Applicable*

- Fingerprint Approval Process***
(attach copy of approval)
Date Completed: _____
- Child Abuse Identification and Reporting Training***
(attach copy of completion certification)
Date Completed: _____
- School Violence Prevention and Intervention Training***
(attach copy of completion certification)
Date Completed: _____
- Dignity for All Students Act Certification Training***
(attach copy of completion certification)
Date Completed: _____
- Teacher Certification Application***: Must be submitted online to the State Education Department along with electronic payment to the New York State Education Department Link: ctetac.us/4L855Df
Date Completed: _____
- School District Employment and Support Commitment* (ctetac.us/44LSWnv)**
- Communicative & Quantitative Skills (CQST) Exam****
Must complete if no college degree/prof. credential
Date Completed: _____
- Verification of Occupational Experience (VOE)** (ctetac.us/44hrkji)**
 - 1 Year of Experience
 - 2 Years of Experience
 - 4 Years of Experience
- Transcripts (Must be Official)****
 - High School/GED
 - Bachelor's Degree
 - Associate's Degree
 - Master's Degree



WHAT IS WORK-BASED LEARNING?

What Is Work-Based Learning?



Student Work-Based Learning



Student Shadowing

Unpaid CO-OPs

- Provides students with a way to specialize in an area of interest
- Things to think about:
 - 1-8 Hours in length
 - Background checks on staff?
 - Organizational rules/regulations around high school students and lab
 - Scheduling
 - Plan what the student will get out of it

- Great for training CO-OPs like are required for certification & NYS
- Things to think about:
 - 40-80 hours in length
 - Same as shadowing
 - Plan a set of competencies to meet certification requirements
 - Ensure staff are prepped to teach and constantly engage

Paid CO-OPs

- Students can provide the same role as an employee
 - Labs don't need to follow NYS requirements for employment in relation to hazardous roles
- Things to think about:
 - 40-80 hours in length
 - Same as unpaid CO-OPs

Work-Based Learning Opportunities



UNIVERSITY of
ROCHESTER
MEDICAL CENTER

 Catholic Health
Laboratory Services



**American
Red Cross**

ROCHESTER
REGIONAL HEALTH
Rochester General Hospital

CSL Plasma


ACM
Medical Laboratory
Affiliate of Rochester Regional Health



Research Labs





**OUR STUDENTS ARE
CAREER &
COLLEGE READY**

Certifications

Phlebotomy Certification

- Required number of successful sticks
- Required number of clinical hours
- Certification exam
 - Check blueprint

Medical Laboratory Assistant Certification

- Required number of hours in external laboratory
- Certification exam
 - Check blueprint



AMT
American Medical Technologists
Certifying Excellence in Allied Health

Medical Laboratory College Opportunities



Articulation Agreements

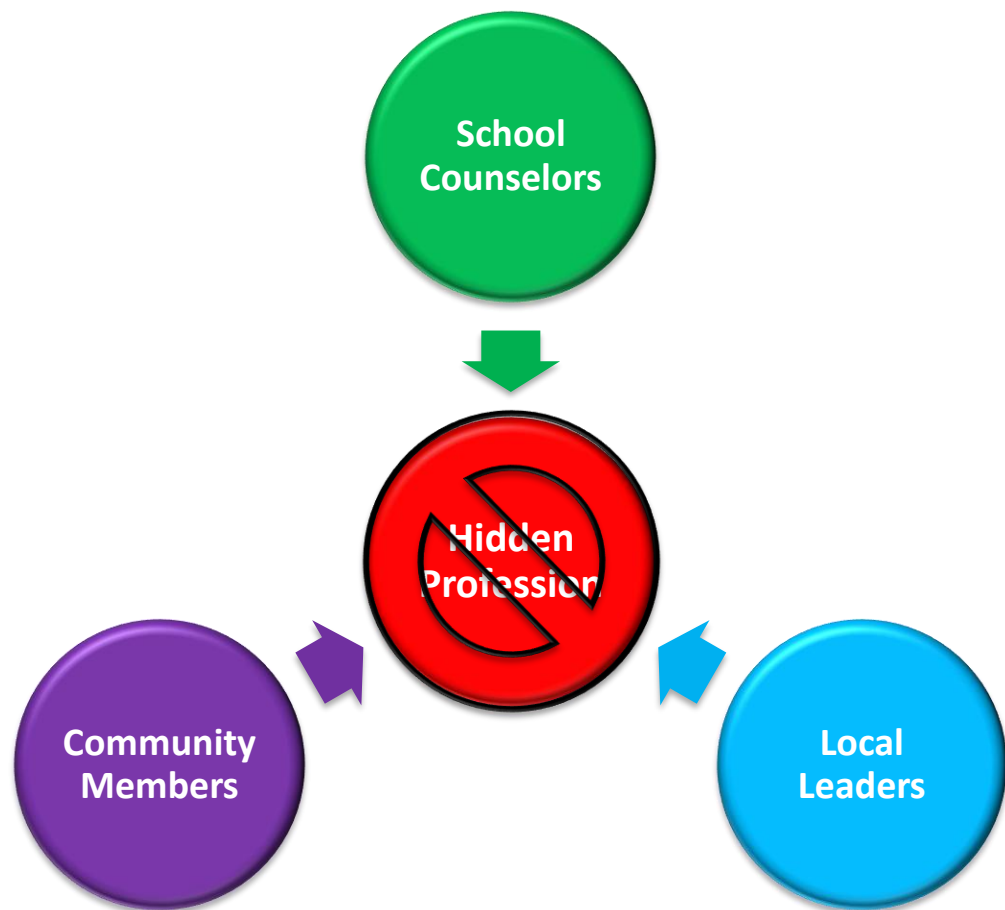
- Priority application status
- Waive application fees
- Waive classes or offer dual credit
- Offer scholarships





BUILDING ADVOCATES FOR YOUR PROGRAM

Build Your Advocates



Building Advocates



School Counselors

- School Counselors Can Be Gatekeepers
- Lack Deep Knowledge About Every Career
- Limited Time To Guide Students
- Need Powerful Easy To Use Resources
- Need Connections With Industry

Local Leaders

- Bring Local/State Leaders Into The Lab
- Setup Tours With Engaging Staff Members
- “Techs In Training”
- Provide Resources To Walk Away With
- Reach Out Regularly

Community Members

- Career Fairs For Laboratory Medicine
 - Must have hands on activities (check out Lauren Schiefelbein’s Low Fi activities for ideas)
- Provide resources to walk away with
- Summer Camps

What School Counselors Need To Know?

Have counselors visit your lab

Career pathways

Plethora of job opportunities

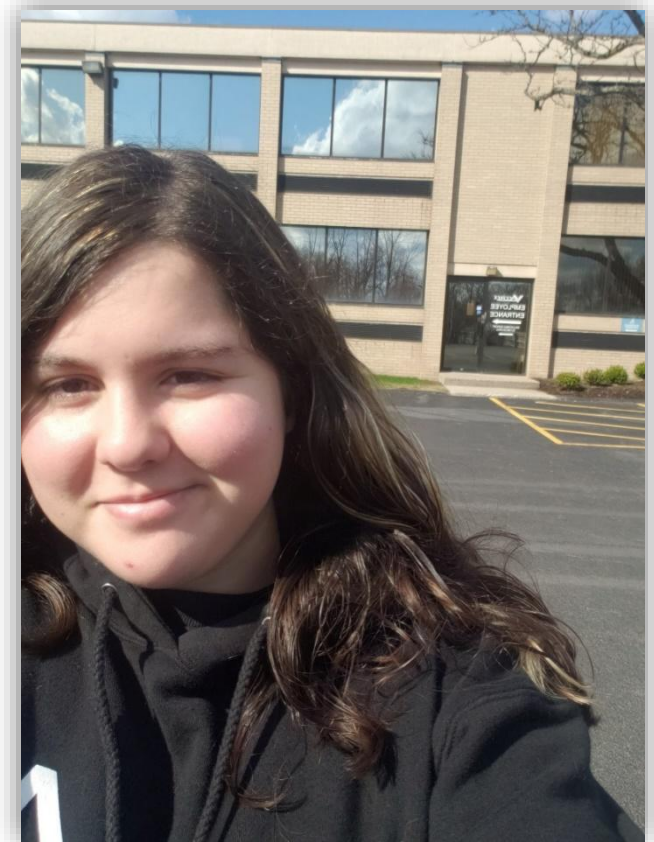
- Entry level
- College requiring careers

College programs in the region

Articulations/dual credits

Certifications

Field trip visits to local medical labs



Student Working At Local Biotech Lab



YOUR LABORATORY'S ROLE IN BUILDING A PROGRAM

For Discussion



Collaborate
Advocate



Set Critical Foundation
Plan



Select Team
Confirm Details



Initiate
Communicate



Collaboration & Advocacy



Network

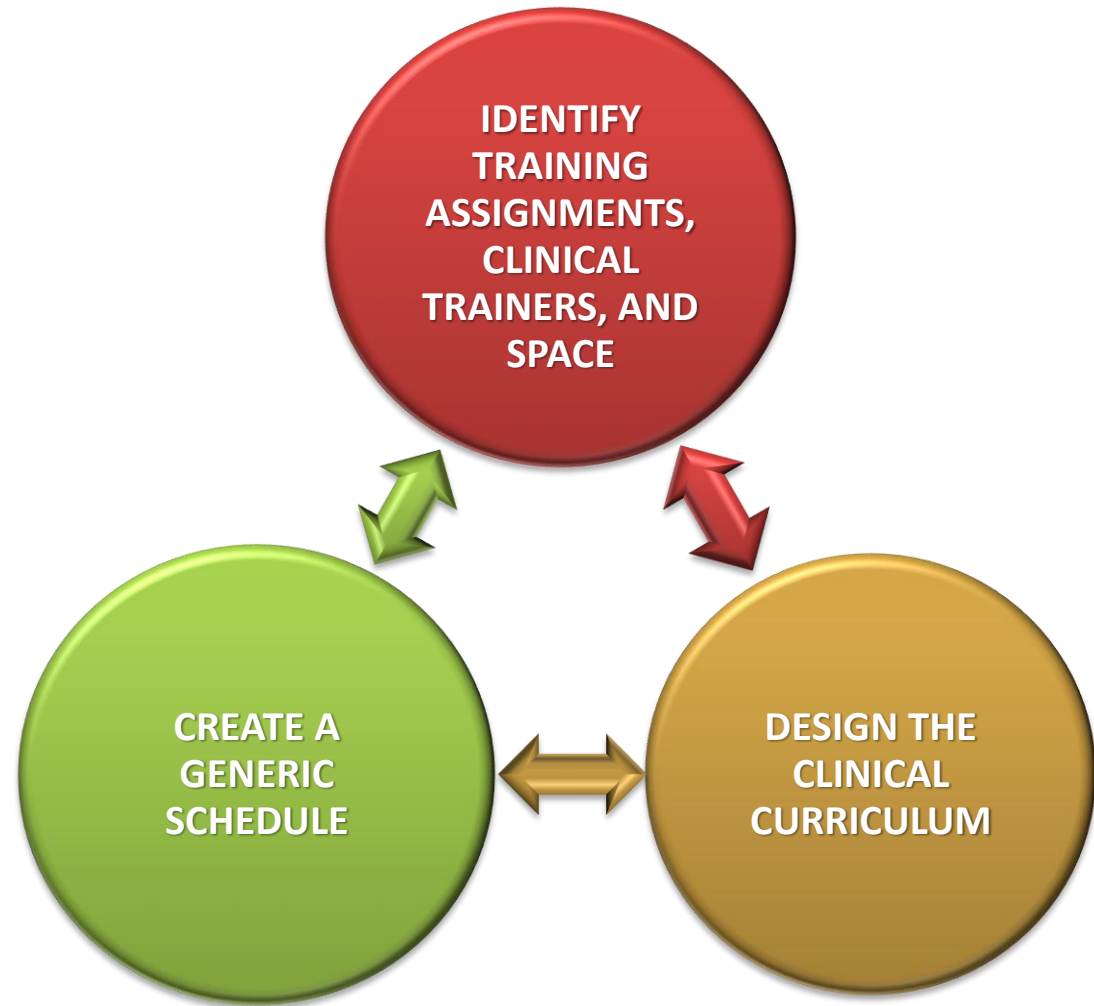
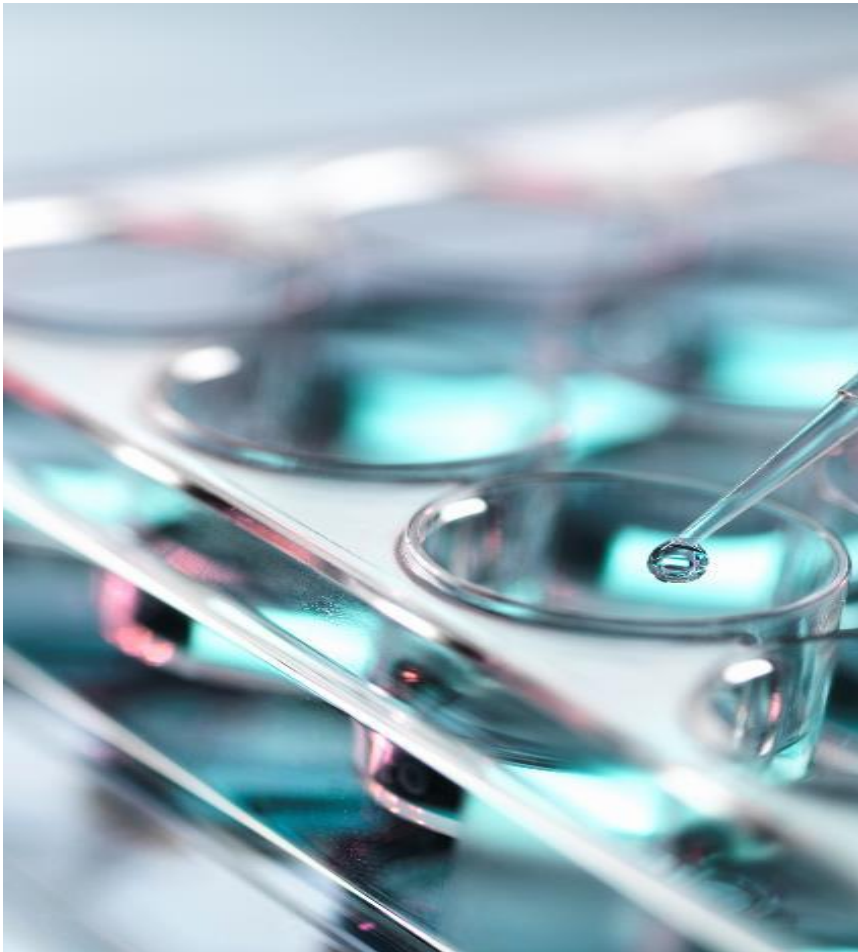
- Join professional organizations that promote careers in pathology and lab medicine
- Connect with high school counselors
- Invite potential partners to tour your laboratories
- Take your show on the road
- Create a business plan and consider the strengths, opportunities, barriers and weaknesses
- Adjust accordingly



Set The Critical Foundation



Set The Critical Foundation



Obtain Approvals

- Present your plan to legal and organizational leadership
- Find out if other departments in your organization have implemented a similar partnership
- If so, find out if they were successful? What challenges did they face?
- State your case to your institutional & department leadership as well as your legal team
- Get commitment from your supervisors
- Provide updates and outcomes at regularly scheduled leadership meetings



Onboarding & Communication

- Legal Contract/Affiliation Agreement
- Biological And Chemical Safety Training (Proper PPE)
- Working With Minor's Policy, Staff Training, And Regular Background Checks
- Forms: Parental Consent That Identifies The Type Of Training, Overall General Risk, And Emergency Contact Information
- Dress Code, Cell Phone And Social Media Policies
- Vaccination And Infection Prevention Records
- Supervision And Escalation Protocols



Implementation



- Orient incoming students (bridge from the concepts covered in their programs or schools – take prior knowledge into account)
- describe your laboratory operation and its impact on your community, give examples
- go over expectations for the week and make sure they know who to contact on site with questions or concerns
- provide a tour of the labs and explain the types of tests being run on the instruments and how the results inform medical decisions
- tell your story and recruit, recruit, recruit

Assess - Adjust



- Check periodically on the students and training staff
- Provide a secure space for students to store personal items
- Before they arrive, let them know if there is food for purchase on site and the cost
- Provide PPE
- Be available for questions, from instructors, home teachers, students or parents if needed
- Assess success, communicate and adjust as needed in real time and after the fact

Questions?



**This is a good time
to stop for
questions before
moving on.....**



MEDICAL LAB PROGRAM KEYS TO SUCCESS

Keys To Success



Early WBL

Challenging
engaging curriculum

Laboratory visits &
guest speakers



We “create the clinical and public health workforce of the future.”

- Chief of CDC’s Epidemic Intelligence Branch Dr. Eric Pevzner

Keys To Success



Adding transferable skills
for career exploration



Enough equipment so
sharing is minimized



Keys To Success



Ensure that the program meets state CTE standards



Promote the Program

- LinkedIn is your friend
- Media Public Relations



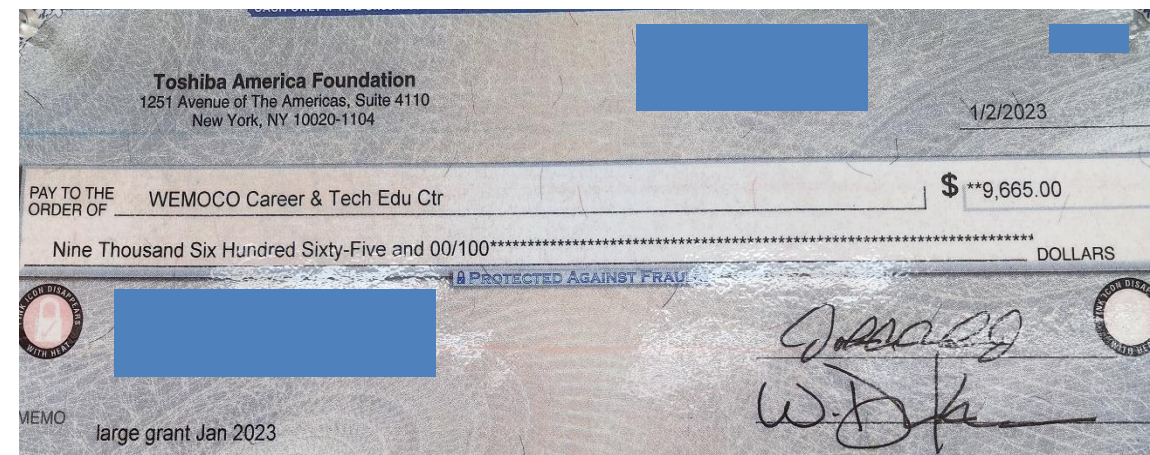
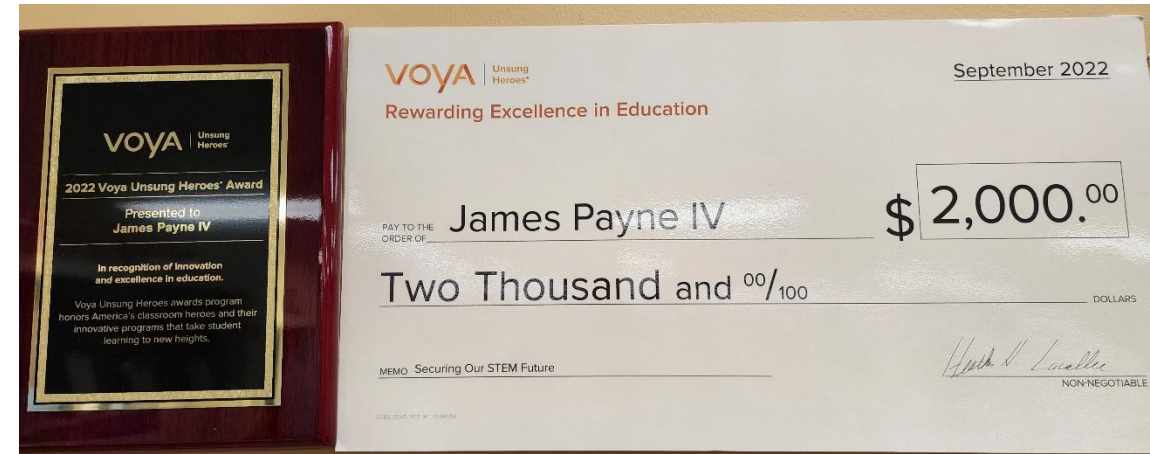
Keys To Success: Affording Equipment



Acquire funding
through grants

- Perkins Grant
- Laboratory Grants

Donations of lab
equipment



Questions So Far



Do you have any questions?



Post Presentation Question

Do you see the value in high school students attending a medical laboratory program that uses a Career and Technical Education model?



Objectives Met



- ✓ **YOU CAN** explain how engaging with high school students (especially in a skills-based program) can increase the exposure of the field and therefore increases the number of students who join the entry level workforce and/or go to college based medical laboratory programs.
- ✓ **YOU CAN** effectively discuss with their staff how to create a high school medical laboratory assisting and phlebotomy program.
- ✓ **YOU CAN** know how to effectively create advocates in their local community that can help spread knowledge of the importance of the medical laboratory.

Recent Articles



ARTICLE: THE PATHOLOGIST MAGAZINE

January 2025

•After being selected for the Power 100 award, the editor ask me to write a feature article for the magazine about ways that people/labs can engage high school students in exploration of laboratory medicine careers: <https://thepathologist.com/issues/2025/articles/jan/stepping-into-the-lab/>

ARTICLE SERIES: ASCP'S CRITICAL VALUES MAGAZINE

August 2024-October 2024

•A three-article series about stages of involvement for promoting laboratory medicine careers to high school students: <https://criticalvalues.org/authors/james-payne>

Works Cited

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3. Scott, K. (2022, January 19). *New Grassroots Organization aims to advocate on behalf of Clinical Lab Professionals*. New Grassroots Organization Aims to Advocate on Behalf of Clinical Lab Professionals. Retrieved February 16, 2022, from <https://www.clinicallabmanager.com/insight/new-grassroots-organization-aims-to-advocate-on-behalf-of-clinical-lab-professionals-26188>
4. Data USA, “Clinical laboratory technician” (2022). Available at: <https://datausa.io/profile/cip/clinical-laboratory-technician>
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Thank You!



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