FUTURE FORWARD

STEM EDUCATION AT THE HORIZON

2023 ANNUAL REPORT

LEARNING UNDEFEATED

Driving race and gender equity in STEM

WHAT'S INSIDE

2022-2023 School Year By the Numbers

In addition to year-round lab programming in six states, we're building amazing new programs with partners across the country! Read more about our consulting projects on page 12.

5 AWARDS

EDUCATORS PICK BEST OF STEM® WINNER 2023

THE EDTECH AWARDS TRENDSETTER FINALIST 2023

THE EDTECH AWARDS COOL TOOL FINALIST 2023

EdTech FINALIST

Leader Setting a Trend
Jennifer Colvin
Chief Innovation Officer

LIGHTHOUSE AWARD AAPA

131 volunteers bringing **STEM** to life

101 SCHOOLS VISITED ACROSS *6 STATES*

ARIZONA | COLORADO | DELAWARE | LOUISIANA | MAINE | MARYLAND
MICHIGAN | NEW JERSEY | PENNSYLVANIA | VIRGINIA | TEXAS

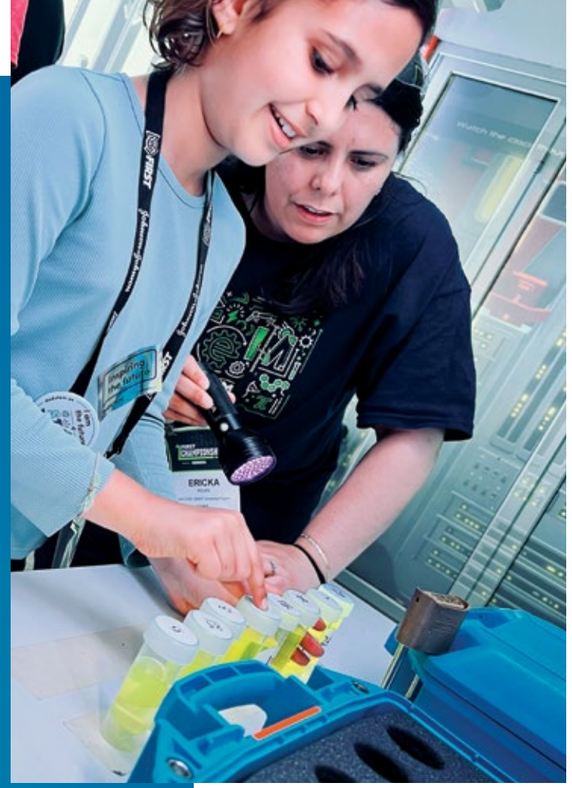
WITH **NEW PARTNERSHIPS** IN 5 STATES

7 mobile labs on the road

160K
STUDENTS PREPARED FOR **STEM** CAREERS

28K ONBOARD OUR MOBILE LABS

4,800
educators reached



Thinking Outside the Box: Under the Hood on the Award-Winning Breakout Box

Imagine stumbling upon an abandoned lab in your school parking lot. Feeling brave, you step inside and a robot avatar asks for your help to restore the power so they can complete their research. Oh, and the clock is ticking: only 20 minutes remains before the data is lost forever!

This futuristic scenario is just one of several immersive learning challenges playing out across the country in Learning Undefeated's Breakout Box game series. These interactive missions leverage the practices of science and engineering as students work together to solve high-tech and low-fi puzzles as they balance time, budget and materials.

FAST FACTS: BREAKOUT BOX

- Available on Drop Anywhere Labs
- Gameplay uses touchscreen walls, AR, holograms & more

CURRENT MISSIONS (GRADES 6-12)

- Body Systems
- Environmental Science

FUTURE THEMES

- Advanced Manufacturing
- Cybersecurity

Educators Pick BEST OF STEM WINNER 2022

EDUCATORS PICK BEST OF STEM WINNER 2023

Our Mobile Labs on the Road in 2023

From Wilmington, Delaware to Corpus Christi, Texas, Learning Undefeated has been all over the map this year!

ARIZONA: PASCUA YAQUI TRIBAL LANDS

We are collaborating with the University of Arizona College of Medicine's American Indian Research Center for Health to develop a new curriculum that blends students' indigenous knowledge with western scientific methods.

DELAWARE: HBCU COLLEGE FAIR

Learning Undefeated hosted 600+ high school and college students onboard the Drop Anywhere Lab at Wilmington's Chase Field House during the HBCU College Fair. Seen here, our event volunteers from AstraZeneca's Newark, Delaware office.

COLORADO: EMERGING LEADERS

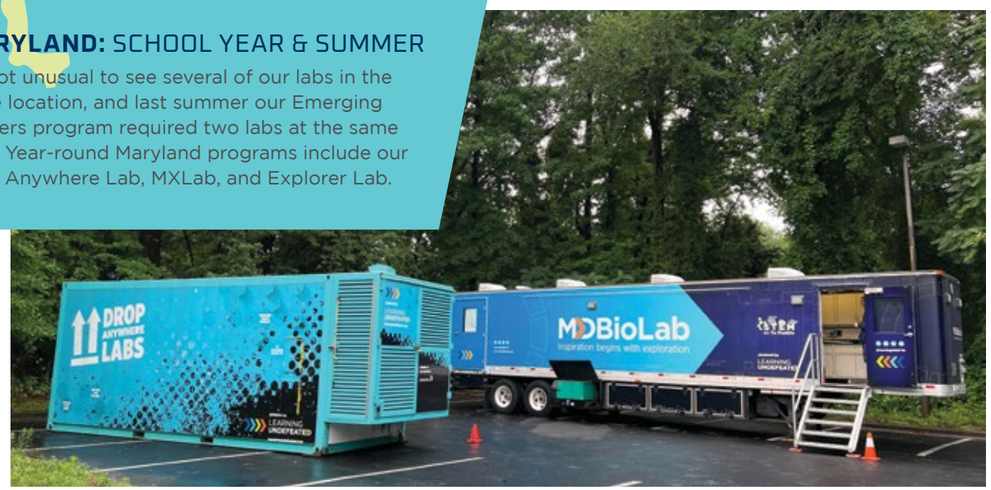
Our first visit to the Rocky Mountains, a summer engineering program allowed high school and college girls to build and pitch their own engineering creation. Read more about the Emerging Leaders program and our amazing alumnae on page 11.

TEXAS: FAMILY STEM NIGHTS

"The Family STEM Night was such a huge bonus for our school," said Elizabeth White, a teacher at Hawkins Elementary School in Hawkins, Texas. "It was so rewarding to see parents and their entire families working with their child on a science project."

MARYLAND: SCHOOL YEAR & SUMMER

It's not unusual to see several of our labs in the same location, and last summer our Emerging Leaders program required two labs at the same time! Year-round Maryland programs include our Drop Anywhere Lab, MXLab, and Explorer Lab.



EMERGING LEADERS in STEM

300+ Internship-Ready Alumnae Strong: Emerging Leaders Build Advanced STEM Skills

EMERGING LEADERS IN BIOTECHNOLOGY

Now in its fourth year, Learning Undefeated's hands-on **Emerging Leaders in Biotechnology** course expands to San Antonio, Texas in spring 2024 thanks to support from DoD STEM. The fast-paced, hybrid program introduces women ages 14-22 to biotechnology topics and careers in an all-female-cohort environment.

Advanced content includes synthetic biology and gene editing. The four-month course also helps students succeed in STEM by increasing their science capital in the areas of knowledge, attitude, experiences, and social contacts and networks.

Emerging Leaders in Biotechnology was purpose-designed in 2020 to encourage young Black and Latina women to explore high-growth military and civilian career areas in biotechnology. More than 300 female participants have already completed the program, and many return a second year to serve as mentors to the high school students.

DR. BENEDETTA NAGLIERI, JEN COLVIN, AND DESURAE MATTHEWS LEAD EMERGING LEADERS WORKSHOP ONBOARD MDBIOLAB.

EMERGING LEADERS IN ENGINEERING

In summer 2023, Learning Undefeated gave Colorado high school and college women the chance to compete in a "Shark Tank" style engineering competition to build, refine, and pitch a product they developed themselves. During the five-day Emerging Leaders in Engineering workshop, participants learned to read schematics, build circuits, and load code while navigating budget, size, time, and materials requirements.

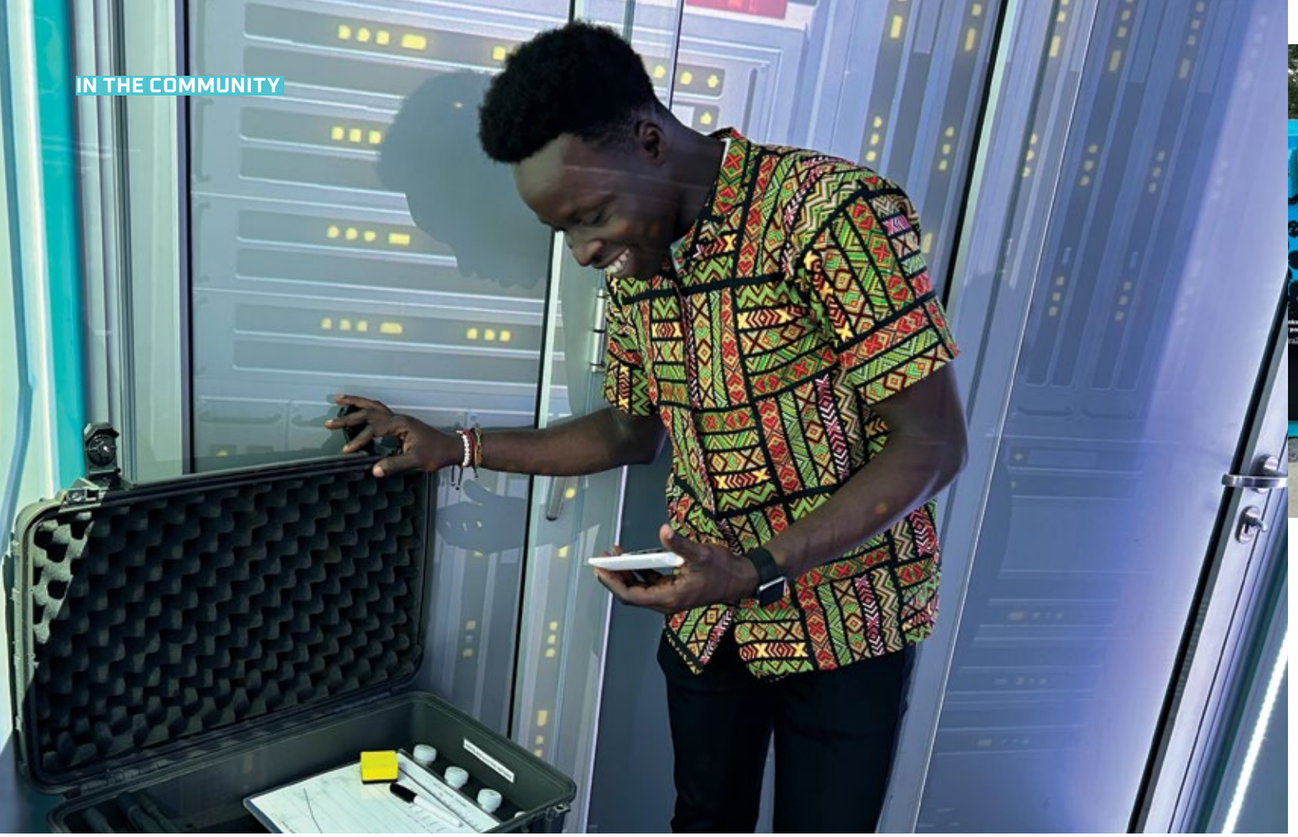
Competition elements included woodworking, 3D printing, Arduino and Tinkercad as the young women designed, built, and ultimately "pitched" their product idea to a panel of judges. This program took place on the Colorado Springs campus of new partner Keysight, and we are grateful for their support.

EMERGING LEADERS ALUMNA AT THE FOREFRONT OF GROUNDBREAKING CANCER RESEARCH

From Emerging Leaders in STEM to Johns Hopkins Medicine, Madison Pleas is leading the way as an example to young women passionate about STEM. While a junior at Morgan State University, Pleas joined Learning Undefeated's inaugural 2021 Emerging Leaders in Biotechnology cohort as a mentor to advance her laboratory skills and boost her resume.

"Being in a collaborative environment like Emerging Leaders prepared me to work in the lab I'm in today," said Pleas. Today, Madison is a lab technician at the Johns Hopkins Sidney Kimmel Comprehensive Cancer Center, where she uses DNA methylation to detect and develop diagnostic methods for cervical, breast, and prostate cancer.

Read more about Madison's success story >>

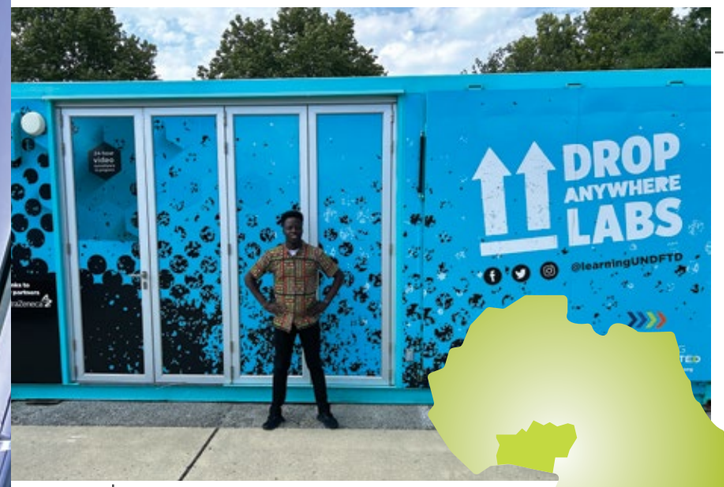


Empowering Communities Through User-Driven STEM Programs

From Maine to Arizona, communities are reaching out to Learning Undefeated for help launching mobile STEM programs. As consultants, Learning Undefeated's experts advise on mobile lab design and operations while working alongside community stakeholders to build legacy programs that will continue to serve the community for many years.

"We know that the best way to work with a community is to help them design their own legacy programs," said Chief Innovation Officer Jennifer Colvin. "Learning Undefeated works alongside community groups to co-develop, deploy, and self-manage their own mobile STEM education programming, bringing two decades of expertise from our own programs." Read on for several of our projects in development.

MANDELA FELLOW JULIUS ILORI HAVING FUN WITH TORI, BRIAN, JANEÉ, JOE AND KRISTIN ON OUR MARYLAND TEAM.



NIGERIA: MANDELA WASHINGTON FOUNDATION

In summer 2023, a fellow from the Mandela Washington Fellowship for Young African Leaders spent three weeks shadowing our educators to learn about mobile laboratories. After collaborating with fellow Juluis Ilori and sharing ways that a program might work in his home country, Learning Undefeated hosted our first-ever teacher professional development session for teachers in Nigeria! "The participants are enthusiastic about becoming part of the Learning Undefeated teachers community and are eager to explore further opportunities," said Ilori. "The positive feedback has filled me with excitement, and we're eager to expand and scale this initiative."

MICHIGAN: K-RESA DISCOVERY LAB

Thanks to a new partnership with Kalamazoo's RESA's Career Connect program, we are helping Michigan students learn about manufacturing careers. "It was really fun to partner with Kalamazoo RESA on this project because we were able to share what we've learned over the past 20 years to help them create this mobile lab experience for students in Michigan," said Learning Undefeated Education Director Joe Wilkerson. Learning Undefeated's educators built out a "Manufacturing and Me" curriculum for grades 4-7 on the new Discovery Lab, built on a tow-behind trailer platform.

MAINE: EDUCATE MAINE BIOLAB

Together with Educate Maine, the Bioscience Association of Maine, and Northeastern University's Roux Institute, Learning Undefeated is co-creating a traveling biolab that will help students explore bioscience careers available for them in Maine. "Growing up in central Maine, I had no resources to learn about STEM careers available in my community," said Janeé Pelletier, Learning Undefeated's EVP of Communications & Government Affairs. "This lab will change the way that Maine students like me think about bioscience careers. I am incredibly proud to be working on this new project for my home state."

The Future is Now:
Artificial Intelligence & Hypersonics Take Flight

It's not science fiction, three brand new activities are bringing artificial intelligence (AI) and hypersonics to the high school parking lot.

Working with AI, students explore machine learning and problem-solve issues of data class bias. To relate the highly advanced concept of hypersonics to real life, high school students complete an engineering design challenge to see which combination of materials work best for astronaut re-entry into Earth's atmosphere.

This forward-thinking content was developed with support from DoD STEM Defense Science, Technology, Engineering, and Mathematics Education Consortium. The new lessons emphasize emerging technology needs and directly support DoD STEM modernization priority areas.

CHECK OUT THESE NEW ACTIVITIES AND BROWSE OUR EXTENSIVE CURRICULUM LIBRARY AT LEARNINGUNDEFEATED.ORG/CURRICULUM.

Department of Defense DoDSTEM Science · Technology · Engineering · Mathematics | DSEC DEFENSE STEM EDUCATION CONSORTIUM | LEARNING UNDEFEATED Educate | Elevate | Empower

SAMUEL EBONG
Southside ISD | San Antonio, TX
PK-12 teacher

We have been fortunate to have Learning Undefeated visit our elementary campuses (Heritage and Freedom) for consecutive years. Our students loved it and our teachers gained so much from the experience. Community STEM night was the highlight. Parents and families came to participate. To be able to show students different approaches to learning. Students were able to see the same concepts more than once and they were taught differently. Hands-on experience was invaluable. ***A student told a campus administrator that the reason that he came to school that day was to participate in the STEM activities.***

ARTHUR FULLER
Gaithersburg Middle School | Gaithersburg, MD
8th grade teacher

I love bringing Learning Undefeated to my classroom because it is a hands-on experience that I can't provide myself. As a teacher, I am always trying to bring new, exciting experiences to my students. Especially for students who need more frequent changes, Learning Undefeated is a great way to make the learning interesting and exciting.

Last year, I had one student who LOVED the Breakout Box experience. So much so that she completed it three times, with three different groups of peers. Each time, she explained certain puzzles to other students to help them understand and complete the breakout room faster. Her third group got the fastest time in the whole school!

ELIZABETH GORDON
Academy for College & Career Preparation
Baltimore, MD
Grades 9-12 teacher

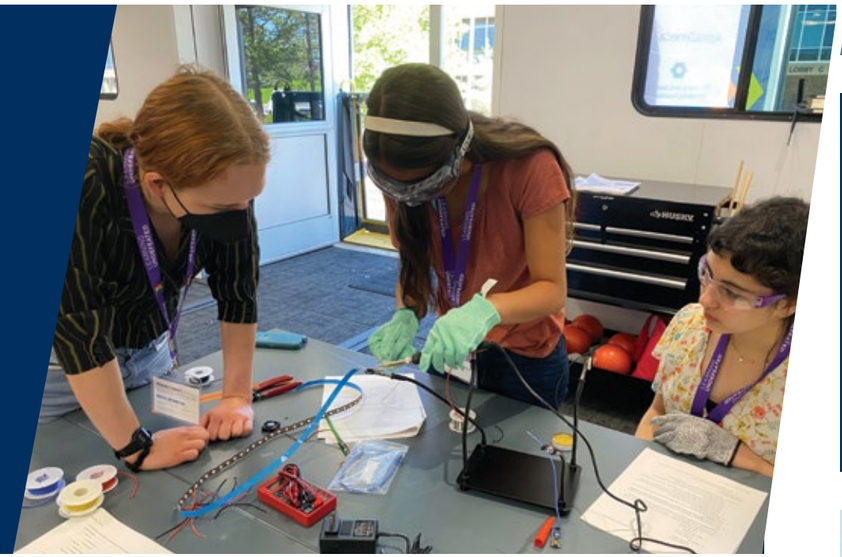
I have been working with Learning Undefeated for the last 16+ years. I book the mobile lab on a yearly basis to run gel electrophoresis labs like Mystery of the Crooked Cell and Wildlife Forensics. ***The labs provided by Learning Undefeated help bring equity to science students everywhere, granting them access to the world of science in a whole new way.***

Get to Know our Mobile Laboratory Fleet

Our flagship education program for over 20 years, Learning Undefeated's mobile laboratories increase student interest in STEM careers by bringing scientific tools and techniques right to the school parking lot. Our fleet of seven mobile labs are custom-built to offer a wide range of student experiences.

M SERIES: MXLab

The largest vehicle in the Learning Undefeated fleet, at nearly 1,000 sqf inside the MXLab is also the country's largest mobile STEM lab for education. This lab handles classes up to 42 students, and includes professional-grade equipment, reagents, and supplies to teach sophisticated biology, chemistry, physics, technology, and engineering curricula.



MdBioLab

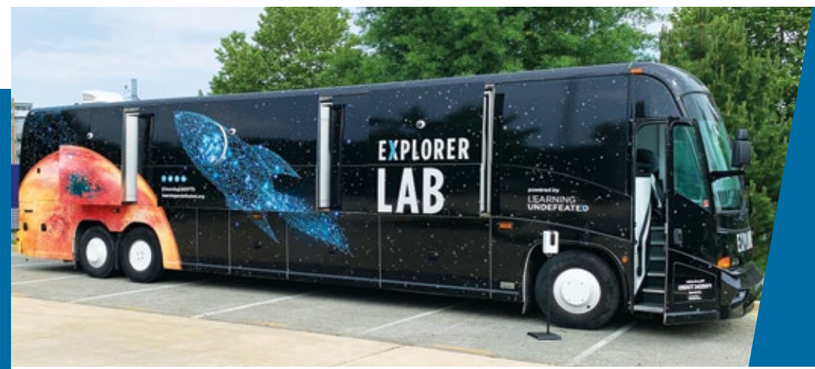
Our original mobile lab model, MdBioLab is a 45-foot traveling wet lab, holding classes of up to 30 students. Now in its 21st school year, MdBioLab has hosted more than 200,000 students!

Drop Anywhere Labs

Shipping-container based Drop Anywhere Labs offer a truly immersive learning experience, with touchscreen walls, augmented realty, and movie-quality light and sound. Student activities include escape-room style biology, environmental science, chemistry, physical sciences, and agriculture experiences.

E SERIES: Explorer7 Model

Our newest mobile laboratory, the E series is light, flexible, and easy to transport. This adaptable laboratory features professional-grade fixtures and finishes and seating for 24 students in groups, to accommodate activities ranging from engineering to chemistry and everything in between.



Explorer Lab

This one-of-a-kind bus takes students on an immersive trip across the solar system, visiting each planet through a jaw-dropping 360-video experience. After touching down on Mars, students explore concepts of engineering and earth & space science by designing their own rover to navigate and analyze the surface of the red planet.

Mobile Lab Educator:
A Day in the Life

Have you ever wondered what goes into making our mobile laboratory program so much fun for students? No two days look quite the same here at Learning Undefeated, especially for our mobile lab instructors! We're taking you behind-the-scenes for a day onboard the MXLab.

TUESDAY

5:30 AM Wake up. This might be at home or might be in a hotel, depending on where the lab is located this week!

6:00 AM Make coffee, pack lunch for the day, check in on email and Slack before heading out.

6:30 AM Drive to school, which might be near or far. Our mobile labs visit a different school every week, and it's not uncommon to travel 500 miles in a week.

7:15 AM Arrive at the school. Start generator, unlock the doors. Lights on, laptop out, heat or AC turned on, prepare lab for students.

7:30 AM Prepare materials for Micropipette Challenge. Mix food coloring dye with distilled water. Divide colors into 15 ML test tubes. Setup student stations. Each station needs: goggles, pencils, paper towels, student handouts, plastic trash containers, markers, six 5mL test tubes, three 15 mL test tubes, peg racks, P1000 micropipettes, and micropipette tips.

8:15 AM Greet students as they arrive. As students walk on, they grab gloves and choose a table where they will work with up to five other students in small groups. Wait for instructions & take attendance.

8:15–9:15 AM Activity time! Students start the Micropipette Challenge at their stations. They begin by following the scientific protocol listed on the activity handout - practicing using the pipette and recording how much liquid they are adding or removing as they go. Once finished with the directions, they find the total volume in each tube and record their answers in a data table. Finally, they compare their results with another group.

9:20 AM Hand out tablets to collect survey data. Clean up stations and collect student handouts.

9:25 AM Students exit lab and instructor resets for the next class. This includes washing test tubes, cleaning pipettes, making sure all paper towels are thrown away, wiping down wet counter tops.

9:40–10:40 AM Switch teaching with co-instructor, second class begins. Same activity, different students!

10:45–11:30 AM Break: check phone, email, Slack. Eat lunch.

11:30 AM–12:30 PM Third class of the day.

12:35 PM Short break: work on curriculum and conduct virtual pre-visits for upcoming schools.

1:05–2:35 PM Final class of the day.

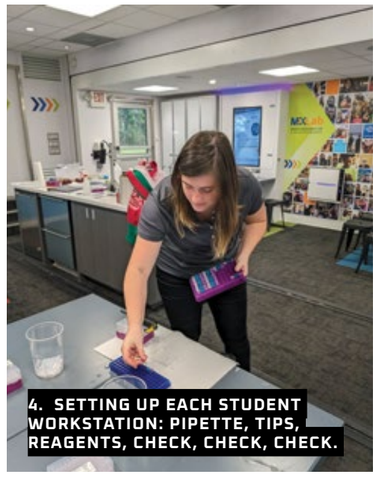
2:40 PM Clean up lab, put equipment away. Prep for tomorrow's Mystery of the Crooked Cell activity. Make sure all of the supplies are on the lab. This includes: agarose gels, electrophoresis chambers, hemoglobin samples, plastic gel trays, power cords, p50, p50 tips, tube tracks, and gloves.

4:00 PM Arrive home, catch up on emails, take any phone calls or meetings on the calendar. Look out for any teacher emails or schedule changes so we can do it all again tomorrow.


1. POWER UP! GOT TO GET THOSE LIGHTS AND HEAT TURNED ON.


2. UNLOCK THE DOOR, COFFEE'S STILL HOT.


3. PREPPING REAGENTS FOR BIO-TECHNOLOGY EXPERIMENTS MEANS LOTS OF VERY SMALL TEST TUBES.


4. SETTING UP EACH STUDENT WORKSTATION: PIPETTE, TIPS, REAGENTS, CHECK, CHECK, CHECK.


5. WELCOMING THE NEXT CLASS ONBOARD MXLAB.


6. ACTIVITY TIME! THESE STUDENTS ARE LEARNING ABOUT GENE EDITING.


7. IT'S A FULL HOUSE ONBOARD MXLAB, WHICH CAN HOLD CLASSES OF UP TO 42(!) STUDENTS.


8. LAST CLASS OF THE DAY, ROCK ON.

9. PACKING UP TO DO THIS ALL AGAIN TOMORROW.

2023 AWARD WINNING PROGRAMS

"At Learning Undefeated, we are constantly pushing the boundaries of what is possible in STEM education. The Breakout Box came out of our 'start with yes' leadership approach, where we push ourselves to make STEM education more interactive and personal. Our educators are constantly innovating, energized by creating new and exciting ways to introduce students to all the possibilities that are out there for them."

—Brian Gaines, CEO | Learning Undefeated

Educators Pick Best of STEM Award
2023 Winner: Life Sciences Breakout Box
Body Systems Mission

EdTech Trendsetter Awards 2023 Finalist: Leader Setting a Trend
Jennifer Colvin,
Chief Innovation Officer

Women Worth Watching in STEM Award
Profiles in Diversity Journal
Jennifer Colvin,
Chief Innovation Officer

2023 AAPA Lighthouse Awards
Communications Category, Award of Excellence
PORT-Able Learning Lab, partnership with Port of Corpus Christi

The EdTech Awards: Cool Tools for Education
2023 Finalist, Games for Learning/ Simulation Solution

CHECK OUT ALL OF OUR AWARDS AT LEARNINGUNDEFEATED.ORG/AWARDS

Our Amazing Team

The work we do would not be possible without the dedication, creativity, and grit of the following team members. Thanks to each of you!

Alejandro Cardemil
Ali Main
Benedetta Naglieri
Brian Gaines
Desurae Matthews
Janeé Pelletier
Jennifer Colvin
Joe Wilkerson
Katie Askelson
Kristin Diamantides
Nicole Santoro
Nora Bransom
Savannah Stone
Sebastian Arnez
Tori Bishop
Victoria Nutt

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Show your support by making an online donation through our website and sign up to become a monthly partner.

FUND A PROGRAM

You can support our mobile STEM lab program by sponsoring:

- mobile lab visits in your priority geographic market
- an Emerging Leaders in STEM cohort
- a specific lab activity for curriculum development

VOLUNTEER

Volunteers can completely change a student's perspective on what it means to work in a STEM field. This year, Learning Undefeated thanks the 100+ volunteers who worked alongside our educators.

Visit our website to view current opportunities and sign up for our volunteer mailing list.

"It's important for AstraZeneca to volunteer in the community because we care! By uniting with Learning Undefeated and encouraging employees to give back through volunteering, we inspire young people to pursue careers in STEM and support our goal of making STEM accessible to all."

—TIFFANY LUKIS
DIRECTOR, STEM & COMMUNITY ENGAGEMENT
ASTRAZENECA

"We are proud to partner with Learning Undefeated to volunteer in schools and help inspire the next generation of scientists and STEM professionals in our community. Led by our Diversity, Equity and Inclusion Champions group, partnering with Learning Undefeated has allowed our team members, many of whom are scientists, engineers and other professionals of color, to show students in our community what's possible when you follow a career in STEM."

—SHIVA FRITSCH
CHIEF COMMUNICATIONS & PEOPLE OFFICER
REGENXBIO

SIGNATURE PARTNERS

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