MANUFACTURE YOUR PATH

TEACHER GUIDE

Thank you for confirming your lab visit! We are excited to bring our mobile laboratory to your school. Please read and review the information below to prepare for your visit.

CHECKLIST

Below you will find a checklist of materials and tasks to be completed before your visit. Details about these forms and the visit itself are provided in the subsequent sections for your convenience.

Material/Task	Completed
Review Manufacturing Challenge Overview	☐
Review Classroom Activity Sets Overview	☐
Pre- Visit Meeting	☐
Parking Map Form	☐
Teacher Contact Form	☐
Visit Schedule Form	☐
Student Permission Slips	☐

BREAKOUT BOX: MANUFACTURING CHALLENGE

In a world where sunglasses are not just a matter of fashion but a necessity for survival, participants will embark on an immersive adventure filled with intrigue, hazards, and reward. The Mission: infiltrate a manufacturing facility that has been monopolized by Evil Eye Corp. to manufacture affordable and sustainable sunglasses for the masses.

The Breakout Box: Manufacturing Challenge, housed inside the Breakout Box takes students on a 35-minute immersive adventure where they apply computational thinking and problem-solving to successfully run an eyewear manufacturing facility. From the moment they step inside the custom-built immersive learning space, students will experiment with game-based learning to build their critical thinking, collaboration, and manufacturing skills.

Participants will control and manipulate different areas throughout the manufacturing process including scheduling, inventory, machine operations, quality control, and maintenance. While learning about these areas, students will need to meet three goals:

1. **Produce as many units as possible in the time provided**
2. **Maintain a high quality control test percentage**
3. **Sustain a high efficiency percentage**

Students will collaborate to overcome disruptions to each process area and meet their goals. By the end of the experience, students will be able to understand the manufacturing process and the importance of teamwork. In the game finale, accomplishments unlocked will be revealed and students will see their final score in comparison to other groups (both at their school and at other schools). Game scoring will include a component of each three goals, which feeds into the overall team and class score. Students will walk away with a resource card to discover local manufacturing opportunities including high school pathways, internships, and entry level career options.

Each 35-minute mission session accommodates up to 30 participants.

GOALS AND OUTCOMES

- **For participants to become familiar with using practices and skills in manufacturing and STEM, including: asking questions and defining problems, analyzing and interpreting data, using mathematics and computational thinking, creative problem solving, obtaining, evaluating and communicating information.**
- **For participants to understand critical thinking strategies such as divergent thinking, logic, reasoning and to learn how to effectively work as a team.**

LEARING OBJECTIVES

- Students will be introduced to manufacturing related careers
- Students will develop critical thinking and problem-solving skills by learning the departments involved in manufacturing (inventory, scheduling, machine operations, maintenance, quality control, and distribution), and identifying and resolving production issues
- Students will be more aware of the way departments work with each other in manufacturing
- Students will learn effective production, distribution, and basic project management skills while planning and controlling schedules, managing inventory, and optimizing distribution
- Students will enhance analytical, communication, and measurement skills by interpreting data for manufacturing process improvements, communicating effectively with cross-functional teams, and applying basic GD&T concepts

MANUFACTURING SKILLS

- Critical and Sequential Thinking
- Technical skills including the understanding of manufacturing processes, machine operations, and maintenance
- Safety Compliance
- Production Planning and Control (scheduling, inventory management, lean manufacturing and continuous improvement methodologies))
- Supply Chain Management (understanding logistics and distribution, procurement, inventory and material handling)
- Analytics (data analysis and interpretation, root cause analysis)
- Engineering (understanding product design and development)
- Communication (effective verbal and written communication and collaboration with cross-functional teams, the ability to read and follow instructions)
- Project Management (time management and executing manufacturing orders)
- Problem Solving (identifying and resolving production issues, implementing corrective actions, and continuous improvement mindset)
- Mathematics and Measurements (precision measurement, metrology, and the basics of GD&T)

STANDARDS ALIGNMENT

1. Manufacturing
    1. Principals of Manufacturing: 2.B, 3.B, 3.C, 6.A, 6.B, 8.A
    2. Diversified Manufacturing I: 1.C, 3.A, 3.E, 7.B, 10.B, 10.C, 10.D, 10.E
2. Science
    1. Core Courses: 4.C
3. Math
    1. Core Courses: 1.A, 1.B, 1.C

CLASSROOM ACTIVITY SETS

To deepen student learning in manufacturing, Learning Undefeated has designed three in-classroom activities that are offered in tandem with the Breakout Box mobile laboratory.

These activities – informed by students, teachers, and manufacturing subject matter experts – give students hands-on experience using manufacturing tools as well as exposure to real-work application of these essential skills in the manufacturing industry.

At the request of participating teachers, Learning Undefeated staff will teach the selected activities in the classroom and provide a professional development opportunity to teachers to learn the curriculum. Teachers who complete the professional development will receive: a certificate to demonstrate their training hours, access to loaner kits for the Design for Manufacturing and Lean Manufacturing activities, and a classroom-ready Metrology set to keep for their school. In addition, all trained teachers will gain access to our loaner kits for all three activities. Each activity can be on loan for up to one month.

Each activity can be run in a 40-60 minute class period.

STANDARDS-ALIGNED CLASSROOM ACTIVITIES FOR GRADES 9-12

Available Activities (led by Learning Undefeated in the classroom)

- Design for Manufacturing | In this activity, students are introduced to the work of engineers in the manufacturing field and are challenged to design a custom part for a new product. Students choose the correct tools to gather precise measurements as well as create a code to print the design with a 3D pen. Skills Focus: Design, measurement, and programming.
  - Texas Essential Knowledge & Skills (TEKs)
    - HS.M.PM.2.C, HS.M.DMI.4.C, HS.M.DMII.4.A, HS.M.ME.2.C
- Lean Manufacturing | In this activity, students are introduced to the concept of lean manufacturing as they work in an airplane manufacturing plant. Students will be challenged to identify waste in different steps of their production process and will be given multiple opportunities to modify the process to improve efficiency. Skills Focus: Problem solving, communication, and data driven decision making.
  - Texas Essential Knowledge & Skills (TEKs)
    - HS.M.PM.3.A, HS.M.DMI.1.C, HS.M.DMI.2.B, HS.M.DMI.7.A, HS.M.DMI.7.B, HS.M.DMI.8.B, HS.M.DMI.10.A, HS.M.DMII.2.B, HS.M.DMII.8.A, HS.M.DMII.8.B, HS.M.DMII.9.B, HS.M.DMII.11.A, HS.M.PracM.3.C

Leave Behind (teacher training required, certificate of completion provided)

- Metrology | In this activity, students are introduced to metrology: the science of measurement. Using metric and English rulers as well as precision calipers, students will learn the difference between precision and accuracy and how both play an important role in the manufacturing industry. Skills Focus: Using measurement tools, and precision measurement.
  - Texas Essential Knowledge & Skills (TEKs)
    - HS.M.PM.2.C,HS.M.PM.3.E,HS.O.EDPS.7.G

PRE-VISIT MEETING

Learning Undefeated staff will schedule a time for a virtual pre-visit meeting with the main contact of your school. The pre-visit is scheduled so that teachers and Learning Undefeated staff can discuss parking, scheduling, activities, and expectations. Pre-visits should be scheduled (4) weeks prior to the school visit. During this meeting, the school's main contact should be ready to show pictures of the proposed trailer parking space to Learning Undefeated staff. Teachers should come prepared with all questions and concerns.

Pre-Visit Expectations

- **Attendance: The main contact for the visit must be in attendance, all other teachers utilizing the program are encouraged to attend.**
- **Preparedness: In addition to offering the Breakout Box: Manufacturing Mission onboard the Breakout Box, teachers can also request in-classroom Manufacturing activities to be led by Learning Undefeated. For the 25/26 school year, we will be offering the following in-class activities:**
  - **Design for Manufacturing**
  - **Lean Manufacturing**
  - **Teachers who request the in-classroom activities will also receive:**
    - ***Training on the selected activity as well as our Metrology lesson***
    - ***A certificate to demonstrate professional development hours***
    - ***A classroom-ready Metrology set for their school***
    - ***Access to loaner kits for the Design for Manufacturing and Lean Manufacturing activities***
  - ***If you would like the in-classroom activities, please be prepared to discuss this with our team during the pre-visit.***
- **Participation: Schedule development will be left up to participating teachers. It is strongly recommended that all teachers participating in the visit collaborate to create the schedule of classes for the visit. Learning Undefeated instructors will provide advice, equipment needs, and logistics recommendations for the proposed schedule.**
- **Readiness: The main school contact should print all important documents for each teacher prior to the pre-visit.**
- **Parking: Parking location will be discussed during the pre-visit. Each school is asked to come prepared with a proposed parking location(s) to the pre-visit meeting.**
  - ***Please note:* The Breakout Box must be placed on a flat, hard, level surface. When delivered and picked up, the driver requires an area of 75 feet long and 20 feet wide to be cleared and marked with cones and/or flagging tape.**

THINGS TO CONSIDER FOR THE ONBOARD SCHEDULE

- **A maximum of 30 students can be on the Breakout Box at one time, and a school staff person must be present on the Breakout Box with students for the entire game experience.**
- **The lab experience lasts 35 minutes.**
- **Allow for a 45-minute break during the middle part of the school day for Learning Undefeated staff.**
- **Classes can run full days Tuesday through Thursday, but on Friday class can only be scheduled up to 1PM.**

FORMS TO COMPLETE (ENCLOSED)

- Parking Map
- Teacher Contact Form
- Visit Schedule Form
- Permission Slip Distribution (our team will collect them onsite)

PERMISSION SLIPS

Permission slips should be returned to a Learning Undefeated staff person at the time of their onboard Breakout Box experience.

Permission slips also serve as a photo release form. If a parent or guardian does not want their child to be photographed, please inform the Learning Undefeated staff. These students will still be permitted to participate, but we will avoid photos with that group of students. Students with incomplete permission slips will not be able to participate and should be provided an alternative location inside the school.

Learning Undefeated will provide a separate copy of our permission slip form.

PROGRAM EVALUATION

To measure our program success and receive feedback for improvements, Learning Undefeated will use evaluation questions in the onboard experience as well as provide an anonymous teacher survey at the end of each visit.

PARKING FORM

The Breakout Box is a self-sufficient immersive learning pod on wheels. A modified touchdown trailer outfitted with advanced technology and equipment, this mobile classroom accommodates up to 30 students, their teacher, and two Learning Undefeated instructors. The Breakout Box uses immersive reality, light, sound, touch screen walls, sensors and gameplay to build an understanding of relevant manufacturing-related concepts. The pod is self-sufficient with its own electricity, heating, and cooling.

Breakout Box specifics: The trailer is a custom-built 38' touchdown trailer that is 45' long x 8'5" wide x 13'5" tall when transported (including the driver's tractor). Once in place and expanded, it is 38' long x 16' wide. It is transported using a standard tractor/semi. The Gross Vehicle Weight Rating (GVWR) is 40,000 lbs.

The Breakout Box parking space needs to be at least 75' long and 20' wide on a hard, level surface.

Electrical requirements: Our pod is equipped with a 100 gallon diesel-powered generator as well as a shoreline.

Shore power requirements: 50amp single phase 120/240v power. NEMA 14-50p connection.

- **The Breakout Box has two entry/exit points. Both sides should remain accessible during a visit.**
- **The pod is also wheelchair accessible. Extra space should be provided on the entrance to provide adequate space for students to access the wheelchair ramp.**

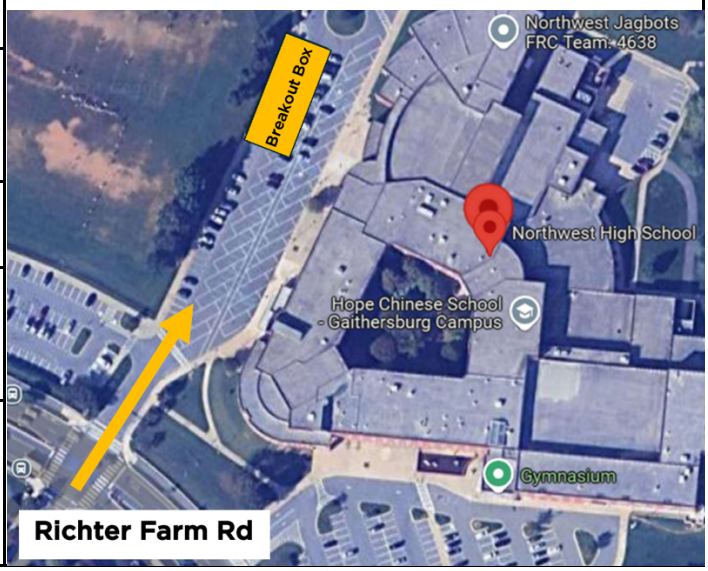
Questions?
Contact our team at manufactureyourpath@learningundefeated.org

PARKING MAP

The parking form is below. A sample map has been included for your convenience. Any questions about parking or this parking map can be directed to savannah@learningundefeated.org.

School:	
Visit date(s):	
Primary Contact:	**Cell Phone:**
Email:	
Address:	
Contact Person for Delivery Day ***(if different than primary contact):***	**Cell Phone:**

SAMPLE PARKING MAP



PARKING MAP

In the space below, please draw or annotate a map of the location where you want the container placed. Please include any landmarks that will help the driver place the mobile laboratory in the correct location. *It would be very helpful if you could also include a Google Maps (satellite view) screenshot of the area.*

TEACHER CONTACT FORM

Please use this worksheet to collect the contact information of all participating teachers. This will allow Learning Undefeated staff to contact teachers prior to the visit for reminders as well as to contact throughout the visit should issues arise. Questions? Contact our team at manufactureyourpath@learningundefeated.org.

FIRST NAME	LAST NAME	EMAIL

SCHEDULE FORM

Please use this worksheet to build the daily schedule for your visit. Please coordinate with all teachers in the school to build this schedule. This schedule can follow your bell schedule but does not have to. Our team is able to offer the Breakout Box: Manufacturing Challenge onboard experience as well as our in-classroom activities. Please note – we cannot offer them both on the same day.

Things to remember:

- **A maximum of 30 students can be on the lab at one time, and a school staff person must be present on the lab with students for the entire onboard experience.**
- **The lab experience lasts 35 minutes.**
- **The in-classroom activities last approximately 40-60 minutes. We require space inside the school to offer these activities.**
- **Allow for a 45-minute break during the middle part of the school day for Learning Undefeated staff.**
- **Classes can run full days Tuesday through Thursday, but on Friday class can only be scheduled up to 1PM.**

	DATE:				
Class Start	Class End	Activity	Grade	Teacher	Expected Student #

	DATE:				
Class Start	Class End	Activity	Grade	Teacher	Expected Student #

	DATE:				
Class Start	Class End	Activity	Grade	Teacher	Expected Student #

	DATE:				
Class Start	Class End	Activity	Grade	Teacher	Expected Student #

	DATE:				
Class Start	Class End	Activity	Grade	Teacher	Expected Student #

2025/26 MANUFACTURE YOUR PATH SOCIAL MEDIA TOOLKIT

Learning Undefeated is thrilled to be bringing the Breakout Box: Manufacturing Mission to your school during the 2025/26 school year! As a nonprofit organization, we really appreciate it when teachers and schools help us share the good work that this program is doing.

This toolkit includes suggested social media posts and/or newsletter content, along with tips for engaging the local media. Please feel free to send this resource along to your school's communications office and let us know of any questions.

Win $100 for your classroom!

Teachers who submit photos or student quotes from the lab visit will be entered to win a $100 Amazon gift card each month. Click the link below to access the submission form. Each photo (up to 10 per teacher) is one chance to win!
https://form.jotform.com/242065799060158

For questions contact:

Nicole Santoro, Senior Marketing Manager

nicole@learningundefeated.org

240.281.9516

SOCIAL MEDIA POSTS

Please help us spread the word about this program by tagging Learning Undefeated on your school social media before and during the lab visit; we have channels across all platforms, including:

- **Facebook: @LearningUNDFTD**
- **Twitter: @LearningUNDFTD**
- **Instagram: @learningundftd**
- **LinkedIn: Learning Undefeated**

We have graphics available for your use here, but feel free to share photos of your own – we love seeing photos shared of your students in the lab! Feel free to use the below sample posts on your channels verbatim or as a template that you tweak as you'd like.

Sample Social Media Posts: one week before the visit

- **Get ready for a one-of-a-kind learning experience coming to [school name]! @LearningUNDFTD's Breakout Box will be visiting our school from [dates]. We're so excited our school was selected for this traveling manufacturing career experience. We can't wait for our students to see what's inside!**
- **@LearningUNDFTD's Breakout Box is coming to town next week! The futuristic learning pod teaches students about high-demand manufacturing careers right here in the community.**
- **Our school is always looking for innovative ways to engage students. We are excited to be one of the Texas schools to receive @LearningUNDFTD's Breakout Box this school year. Keep an eye out in the parking lot for this expandable learning pod next week, bet y'all won't be able to miss it!**
- **The Manufacture Your Path Program is coming to [school name]! We are so thrilled to have @LearningUNDFTD visit us from [dates] to teach our students onboard the big #mobilelab. Get ready for some exciting experiments!**

Social Media Posts: during the visit

- **@LearningUNDFTD's Breakout Box is a futuristic learning pod for high school students. Onboard the lab this week, our students will work together to control and manipulate different areas throughout the manufacturing process.**
- **Now you see it: this week @LearningUNDFTD's Breakout Box is visiting our school! Our students will learn all about the manufacturing process and the importance of teamwork. Here are a few pics from today's classes featuring [teacher/student names].**
- **Day 1 aboard @LearningUNDFTD's Breakout Box was a success! This week our students will work together to successfully run an eyewear manufacturing facility. They'll work together to learn about the manufacturing process and careers available right here in the community!** 📸
- **Have you spotted @LearningUNDFTD's Breakout Box? This week, we have a very special visitor to the [school/location, ex. "Frisco Elementary parking lot"]. Students**

kicked off today with the Manufacturing Mission – check out these pics from [teacher]'s class on board!

- PERSONALIZE YOUR OWN! Examples:
    - Mrs. Reyes' tenth-grade class is applying computational thinking and collaborating skills to successfully run an eyewear manufacturing facility onboard @LearningUNDFTD's Breakout Box.
    - Please click here for more information about the Manufacture Your Path program to include in your posts: https://manufactureyourpath.com/

Amplifying Visit via Local Media

While not a requirement, many schools invite local media to visit the mobile laboratory while it's on-site – it's quite a fun, visual story! Working with local media is an excellent way to showcase the fun learning experience that your students are having. Check out this story in the Dallas Morning News about the program.

Kindly share any local media opportunities that might feature the mobile lab with the Learning Undefeated team so that we can share stories with our followers, too!

Just drop a note to Janeé Pelletier at janee@learningundefeated.org. Please also let us know of any questions.

Below is key messaging about this one-of-a-kind program that you can pick and choose from to use when reaching out to reporters. We recommend starting to reach out a week or so ahead of the visit, though we also recommend calling news stations the day before visits – they usually don't lock in their interview calendars until right before in case of any breaking news.

Also, let reporters know of any media rules (ex. Must check in at the front desk and get a pass), where to go (maps can be helpful), and restrictions your school has ahead of time, so they are prepared. Collecting media permission slips in advance can also be helpful.

Messaging for media outreach:

- Learning Undefeated's Breakout Box: Manufacturing Mission is a totally new way for students to interact with and learn about high-demand manufacturing careers in their own community.
- The Breakout Box is operated by nonprofit organization Learning Undefeated, in partnership with the Caterpillar Foundation.
- From the moment they enter this purpose-built futuristic learning pod, students use game-based learning to control and manipulate the manufacturing process in a fast-paced challenge that builds critical thinking, communications, and problem-solving skills.
- Would you be interested in doing a story on Learning Undefeated's visit to [school]? We would be happy to coordinate a (safe) site visit once the mobile lab is in [city].

Additional helpful messaging to know for interviews:

- **The Breakout Box is housed in a custom-built 38-foot double expandable pod, which travels from school to school using a tractor trailer. The ultramodern, one-of-a-kind vehicle is equipped with custom graphics, touchscreen tables, eight giant touchscreen monitors, and Hollywood-style lighting effects and surround sound.**
- **The core of the learning experience is a custom-built video game, which runs ten student activity stations simultaneously. The student stations engage and interplay at different points throughout the game, requiring students to work together to resolve production issues.**
- **During the 35-minute immersive adventure, students apply computational thinking and collaboration skills to successfully run an eyewear manufacturing facility. Participants control and manipulate different areas throughout the manufacturing process including scheduling, inventory, machine operations, quality control, maintenance, and distribution.**
- **To deepen student learning in manufacturing, Learning Undefeated has also designed three in-classroom activities that are offered in tandem with the Breakout Box mobile laboratory.**
- **Manufacturing is one of the fastest-growing sectors of the US economy, offering stable, high-paying jobs on the cutting edge of technology. Yet, teens consistently rank manufacturing at the bottom when it comes to career interest. The Manufacture Your Path program was based on more than a year's worth of research that included a comprehensive landscape analysis of more than 100 manufacturing education programs across the US, subject matter expert feedback from 15 companies across a wide swath of industries and products, and focus groups of nearly 60 educators teaching grades 6-12.**

A few media tips and reminders for interviews:

- **Think of it as a conversation with the reporter, letting the technology (camera/recorder) "eavesdrop" on the discussion.**
- **For video interviews, ask the reporter if it will be pre-recorded (they typically are). If so, feel free to take a moment to think of your answer or even re-start a response during the interview if you want to!**
- **If on video via Zoom, make sure to avoid any backlighting (even closed blinds behind you can look off on camera).**
- **Review key messaging beforehand but try not to read from anything during the interview.**
- **You can always follow up with information via email after the interview if you don't know an answer in real-time.**
- **Smile and have fun!**

Messaging to Include in School/District Newsletters (post-visit highlights)

For those wanting to show off the experience with parents, please see recommended language to include in newsletters after the visit.

- **We had an amazing time last week onboard Learning Undefeated's Breakout Box. [Grade level(s)] students had the chance to learn all about the manufacturing process and careers that are available right here in the community.**
- **"Quote from a student's experience," [Name, grade level].**
- **Add in photos both inside and outside of the Breakout Box.**