



Stem Solutions @ MECHS
School Wide Design Challenges



Questions that drove this work:

- How do we grow as a STEM Building?
- How do we engage community partners?
- How do we engage our students in solving authentic problems?

The Idea

STEM Solutions Community Challenge

Marysville Early College High School Students have the opportunity to work with a number of our city and county services and business to help solve real problems these community leaders face.

At our kick-off event on October 21st, students at ECHS will learn about our community partners and the challenges they face. Students will then identify one problem to attempt to solve in the next three months. Using our design cycle, our habits of mind, the guidance of our staff, and the skills and knowledge we have learned from our pathways and core classes, our students are going to propose solutions to the real problems our community partners face. Our students are naturally curious and vitally interested in authentic, real world issues that affect their community and themselves. Dedicating some time to them and their endeavors provides them with opportunities to utilize our building's FORCES Habits of Mind (Flexibility, Outside the Box Thinking, Resilience, Communication and Collaboration, Empathy, and Self-sufficiency.)

After our Kick-Off event, students will have time dedicated to follow our design cycle through the planning, creation, and communication phases. Our pathway teachers will serve as professional experts, giving our students feedback and challenging them to think deeply about their proposed solutions. A great design challenge rarely has an easy solution. Our students will be asked to push their learning and their skills to show real resilience to create something they can be proud of.

Students will then present their projects back to the community partners in December. Our stellar projects will be featured at this year's STEAM night and will be submitted to the state for consideration for the Ohio statewide design challenge awards. This is our students' chance to make a positive impact on our community.

PART 1: Identify (Oct. 21st)

Driving Questions: What problem do you want to help solve in your community?

Overview: Read through the community partner overview and pick three presentations that you want to attend. After you see the presentations, select one problem that you want to focus on solving.

Major Product: By the end of the day, you will have selected a problem to solve, identified leadership skills and joined a working group, and been assigned a teacher leader for your problem.

Constraints: Will be determined by the community partner.

Expectations:

- Be a respectful and active listener as they listen as problems are presented.
- Pick a group wisely and contribute meaningfully to the group.
- Think flexibly and outside the box while picking a problem to solve.
- Work collaboratively and take pride in your work.

PART 2: Plan and Create (Oct 26th, Nov 9 and 16, and Seminar)

Driving Questions: How do we investigate an authentic problem and imagine a solution that hasn't been proposed previously? How do we use the evaluation and improvement cycle to create a realistic and effective solution to our problem?

Overview: Each team will plan and create a solution to our community problems while receiving feedback from peers, core content staff, and pathway professionals.

Major Product: You will have a proposed solution and a professional presentation outlining that solution ready to present to your community partner by December 14th.

Constraints:

- You will have three one hour blocks in the morning to work and will be given one block of seminar to complete this portion of the project.
- Student groups will present their solution to their community partners and receive feedback on their plan on our community presentation day and celebration on December 15th.
- Materials other than those readily available at school must be provided by the group.

Expectations:

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- Contribute meaningfully to the overall success of the event.
- Use our Habits of Mind, using the rubric to guide what you will be assessing.
- Work collaboratively and take pride in your work.
- Create a proposed solution and a professional presentation of learning.

PART 3: Communicate (Dec. 14th and 15th)

Driving Questions: How do we communicate our solution effectively to a business audience?

Overview: Each team will present their solution to the community partner.

Major Product: STEM Solution Presentation and/or Product

Constraints:

- You will have no more than 5 minutes to present your solution to your community partner.
- Professionally present to your audience with each group member actively participating in the presentation or creation of the presentation.
- Show professionalism and communicate clearly with your audience. Every group member needs to be prepared to answer questions after their proposal has been given.

Expectations:



Questions that drove this work:

- How do we assure that community members have a positive and meaningful experience?
- How do we prepare staff so they are confident and excited to guide students through the process?
- How do we guide students through the design cycle and empower them to represent ECHS?



Leadership team helps to divide the work!

Team 1: Community Partners Team

- Team brainstormed businesses in the area that had partnered with the schools previously and new opportunities that students may be interested in
- Email sent out
- Chart of business/contact/problem statement
- Scheduling zoom/in person feedback meetings
- Scheduling final in person presentations
- Engage media (social media/newspapers) for coverage



Team 2: School Team (manage all the logistics)

- STEM Solutions Kick Off Day: [schedule](#)
- Held class meetings to introduce STEM Solutions Day
- Students [select](#) top interests and were scheduled into sessions
- After students attended presentations on STEM Solutions Day, they selected a [problem](#) to focus.
- Held training for staff and run through the process
 - We used “cell phones are a problem in the classroom” as our mock problem for the staff to solve
 - Allowed for questions and clarifications
 - Helpful to have your partner school create a “[one stop shop](#)” for information access



Questions that drove this work:

- How do we create a space where conversation between community members and students could be accomplished?
- How do we prepare teachers to guide students through problems they have not encountered?
- How do we schedule and guide students to sustain enthusiasm throughout a multi-month problem of their choice?

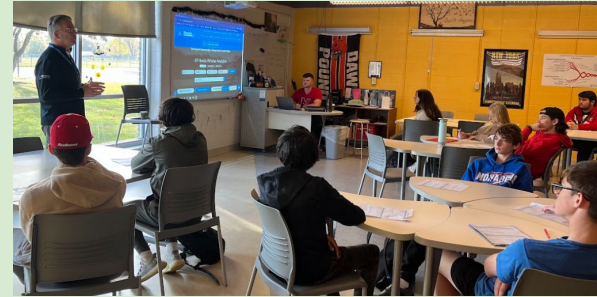


The Day

- Students listened to 3 different Community Partners and chose 1 to focus on.

The Work

- Students work time:
 - The rest of the kick-off day
 - Three one-hour work sessions
 - Five 85 minute consecutive blocks
- Worked through the [design cycle](#) and slides prepared and shown earlier.
- Feedback day via zoom or in person
- Finish and refine community presentations





Questions that drove this work:

- How do we schedule presentations and guide community partners to give students meaningful feedback?
- How will the staff prepare students for their final presentations?
- How do we create an experience to allow students to shine?



Presentation Day

- Student groups were scheduled to present their solution to the community partner. All groups were given feedback from the community member.

Project Reflection

- All students were asked to reflect on the ECHS Habits of Mind and the ECHS Design Cycle throughout STEM Solutions.

Resources

- [Presentation Schedules](#) and [Email draft](#) to Students
- Community Partner [Feedback Form](#)
- [Project Reflection](#)





Opportunities Beyond STEM Solutions

- DriveOHIO student group invited to present and continue working on their solution
- New internship opportunities for students with different businesses
- Student agency in community problems they want to solve.
- Student ownership with their solutions



Questions?

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