ENGINEERING 1: BUILDING FOUNDATIONS IN DESIGN AND PROBLEM SOLVING

Introduction to core skills for effective engineering solutions

COURSE OVERVIEW

WHAT IS ENGINEERING 1?

Course Overview

Engineering 1 introduces students to design, technology, and problem-solving fundamentals in engineering.

Hands-on and Digital Projects

The course combines practical projects and digital simulations for a meaningful learning experience.

Use of Engineering Tools

Students utilize tools like AutoCAD and WhiteBox Learning systems to simulate engineering challenges.

Foundation for STEM Careers

The course builds foundational skills preparing students for advanced STEM studies and engineering careers.

THE LEARNING PROCESS

FROM CONCEPT TO CREATION

Research and Brainstorming

Students identify engineering problems and explore multiple potential solutions through brainstorming and research.

Sketching and Drafting

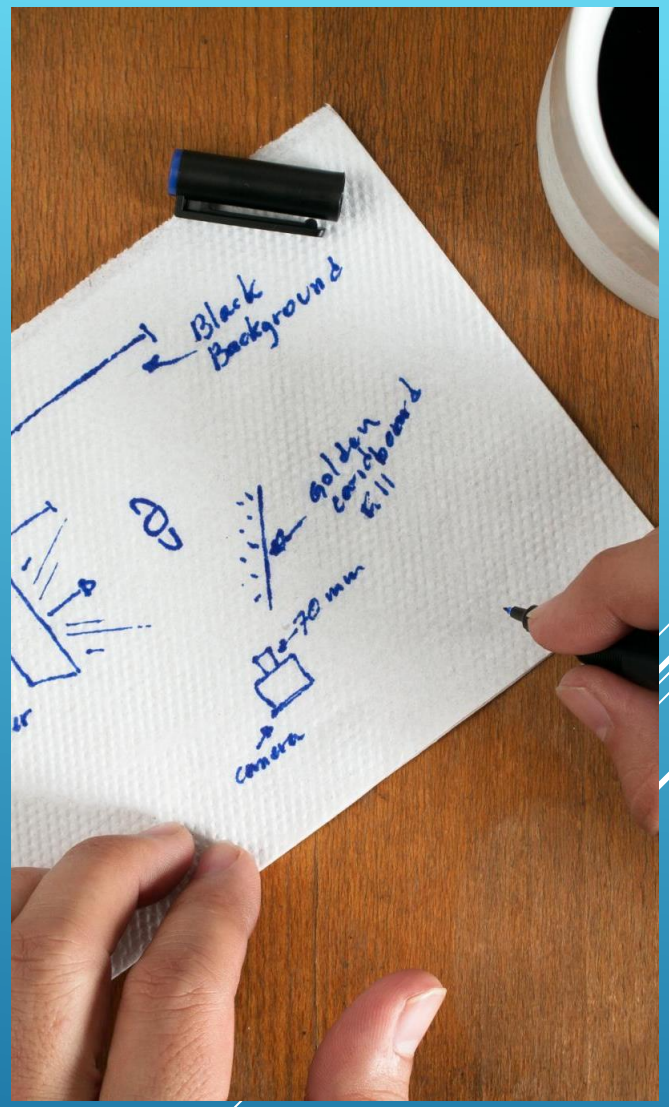
Applying technical drawing standards, students sketch and draft ideas to visualize engineering concepts clearly.

Modeling and Simulation

Using AutoCAD and design software, students create digital models to simulate and refine their engineering concepts.

Prototyping and Testing

Students build and test physical prototypes, gaining practical experience with materials and fabrication techniques.



AUTOCAD PROGRAM

MASTERING INDUSTRY-STANDARD TOOLS

Learning AutoCAD Fundamentals

Students acquire essential AutoCAD skills including title blocks, precision measurements, and drafting 2D shapes.

Managing Layers and Line Types

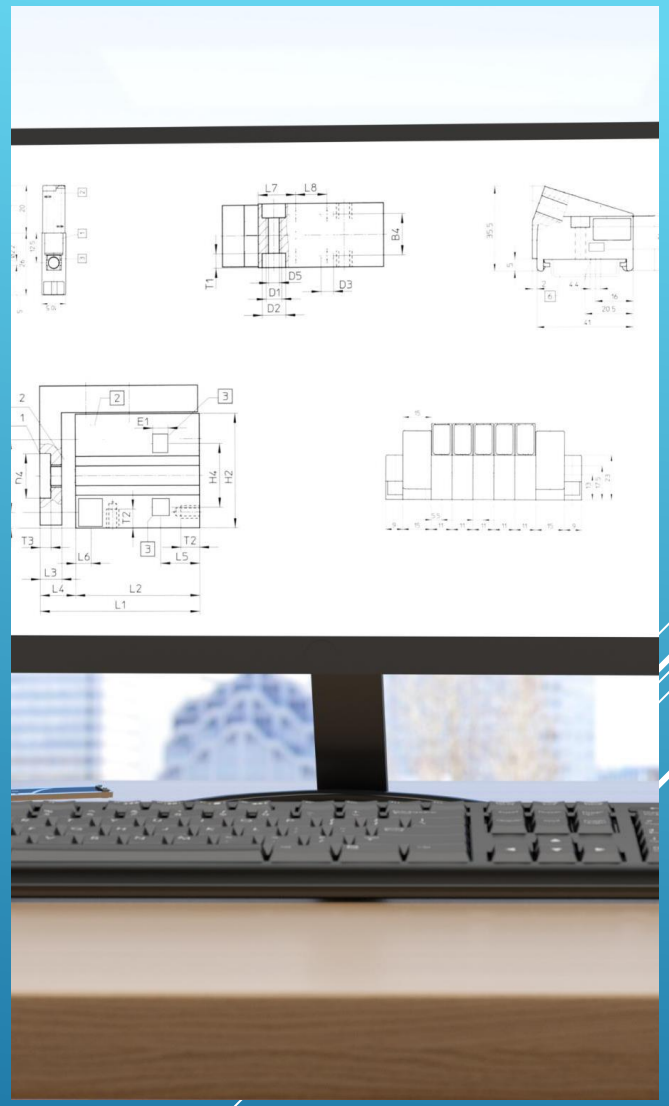
Students learn to organize drawings by managing layers and using various line types effectively.

Applying Dimensioning Techniques

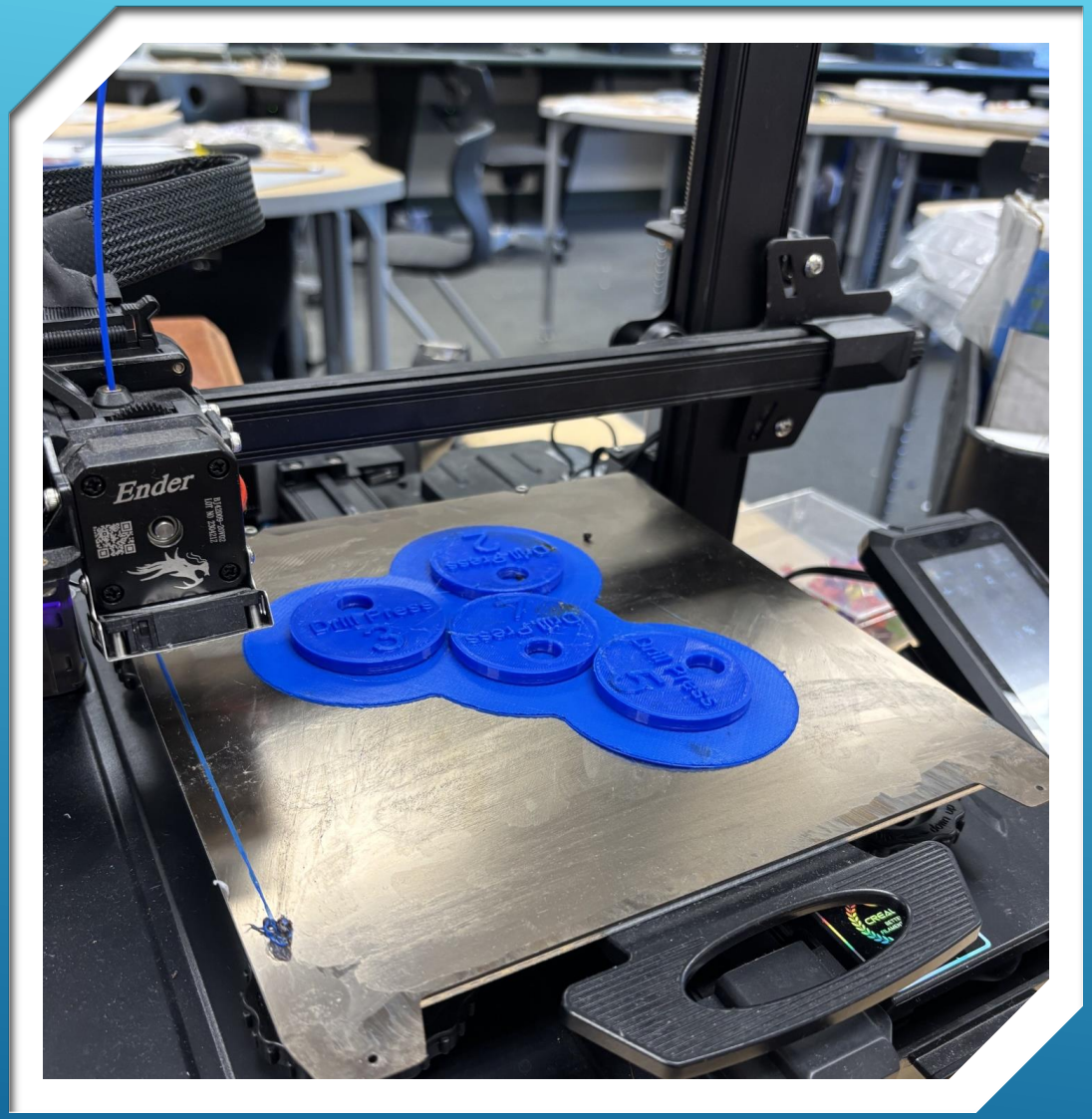
Dimensioning techniques help students add accurate measurements to their digital drawings.

Building Foundation for Technical Careers

Mastering AutoCAD early boosts student confidence and prepares them for advanced design challenges.



THE TAG PROJECT



Introduction to Tag Project

Students create custom engraved name tags using AutoCAD, learning precision sketching and design constraints.

Design Considerations

Students consider material limitations and aesthetics to create functional and visually appealing tags.

Fabrication and Outcome

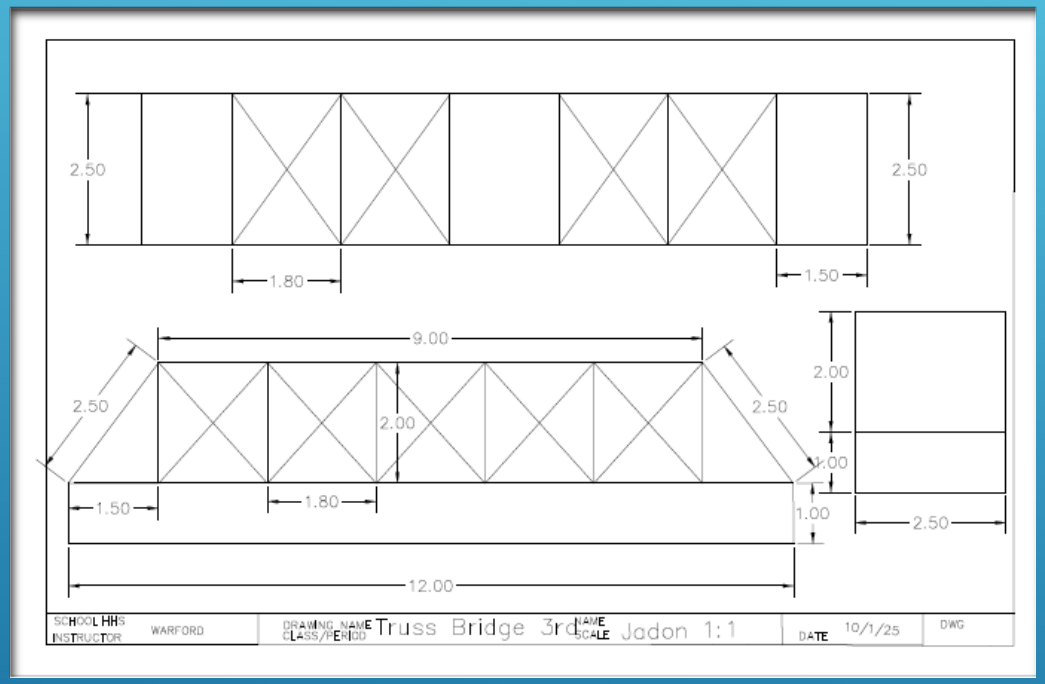
Digital designs are exported for CNC or laser cutting, resulting in tangible wearable products.

Skills and Confidence Building

The project reinforces technical skills while boosting student confidence and engagement through a hands-on experience.

THE PERSONAL DESIGN CHALLENGE

THE BRIDGE PROJECT



Learning Structural Concepts

Students explore truss types and forces to understand structural engineering basics.

Simulating Bridge Designs

Using software, students optimize bridge designs for weight and strength through simulations.

Building and Testing Models

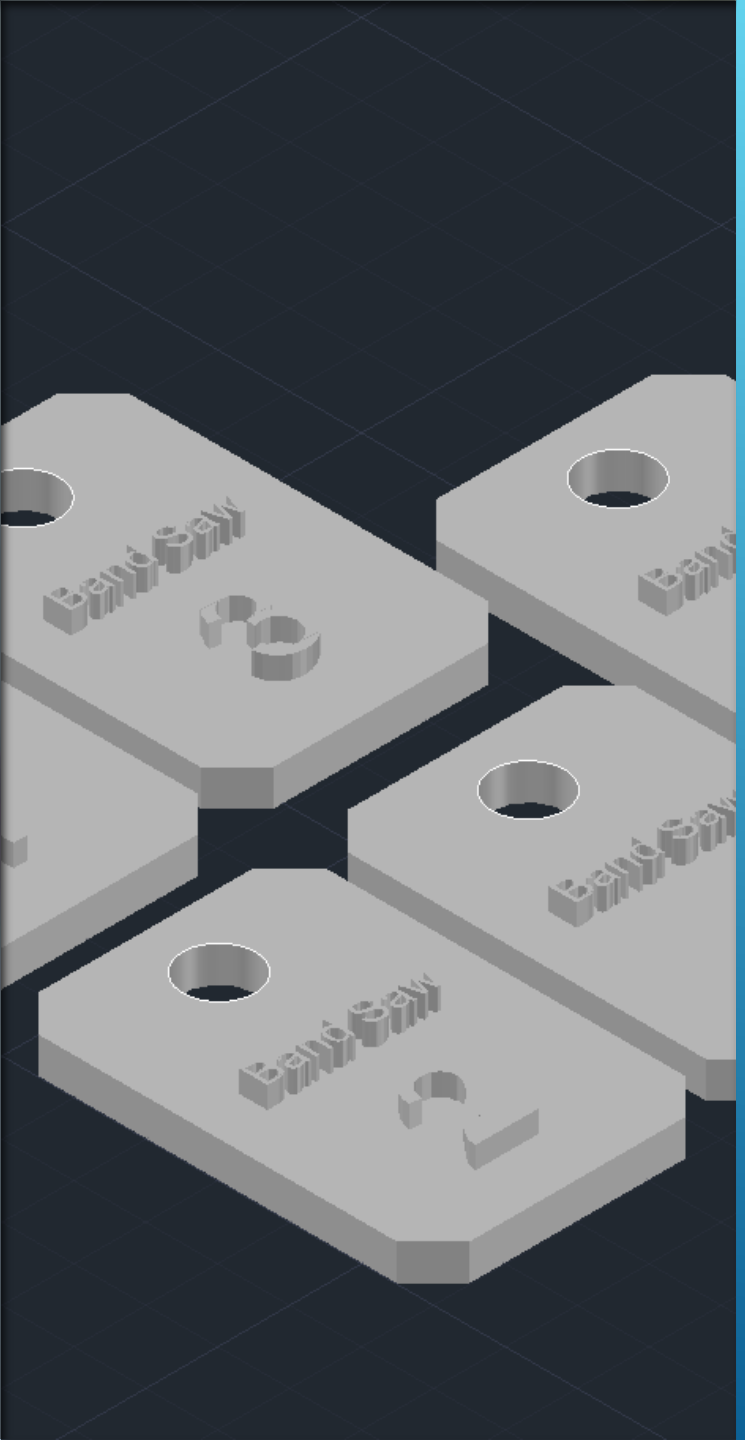
Physical bridge models are built and tested to measure breaking force and refine designs.

Teamwork and Iterative Design

The project encourages teamwork and iterative improvements based on data analysis and test results.

ENGINEERING IN ACTION

STUDENT WORK SAMPLES



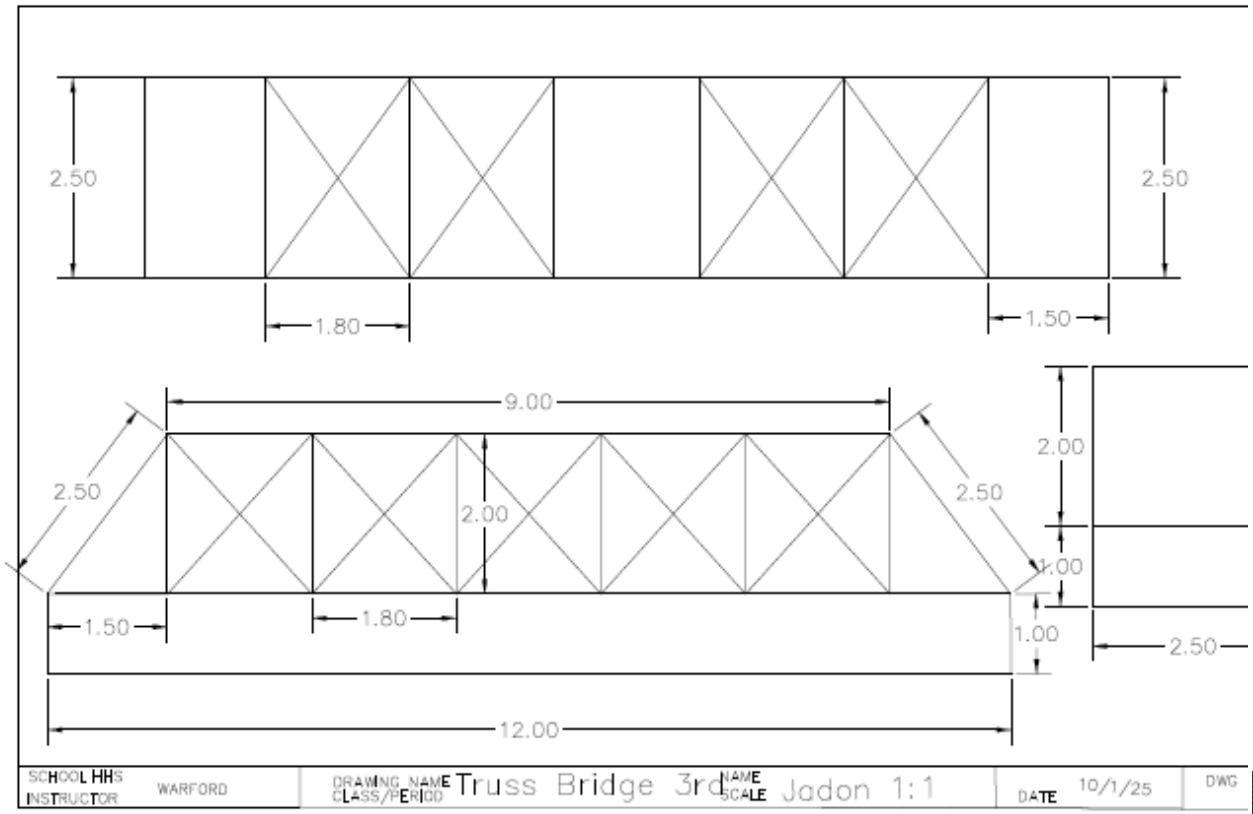
Exemplary Student Work

Showcases AutoCAD drawings, bridge data charts, and physical engineering builds created by students.

Student Reflections

Student quotes reveal the personal impact and learning experiences gained through the course.

SHOWCASING STUDENT SUCCESS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SCHOOL HHS
INSTRUCTOR WARFORD
DRAWING NAME Truss Bridge 3rd
CLASS/PERIOD
NAME Jadon
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DATE 10/1/25
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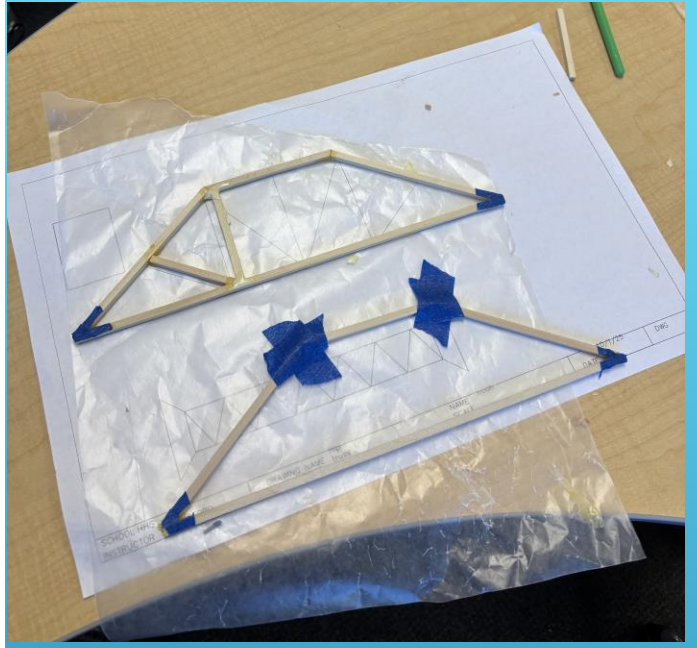
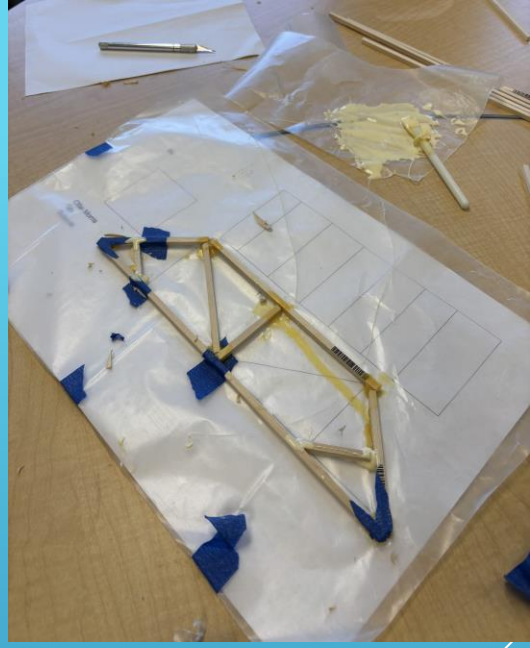
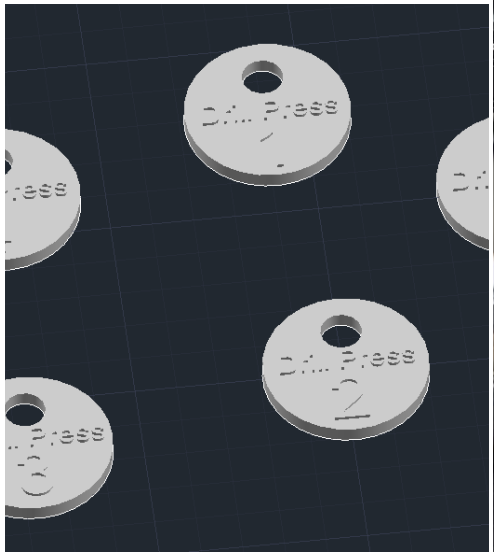





Band saw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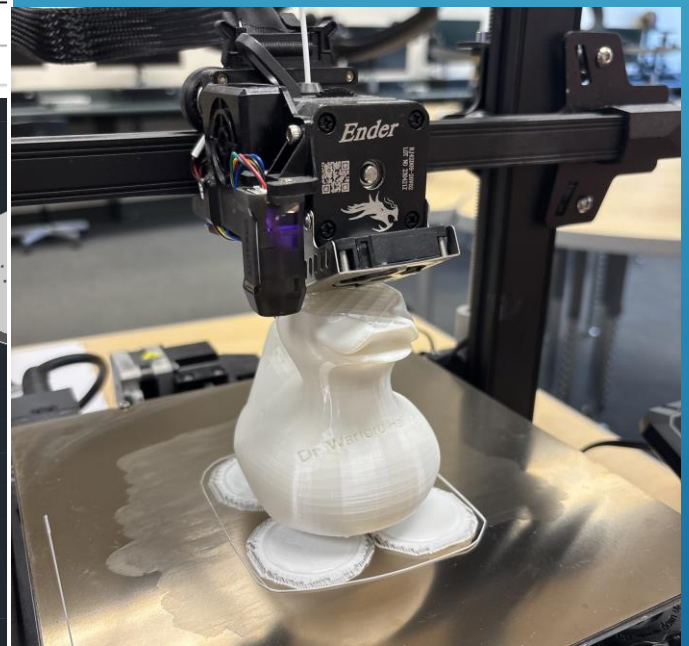
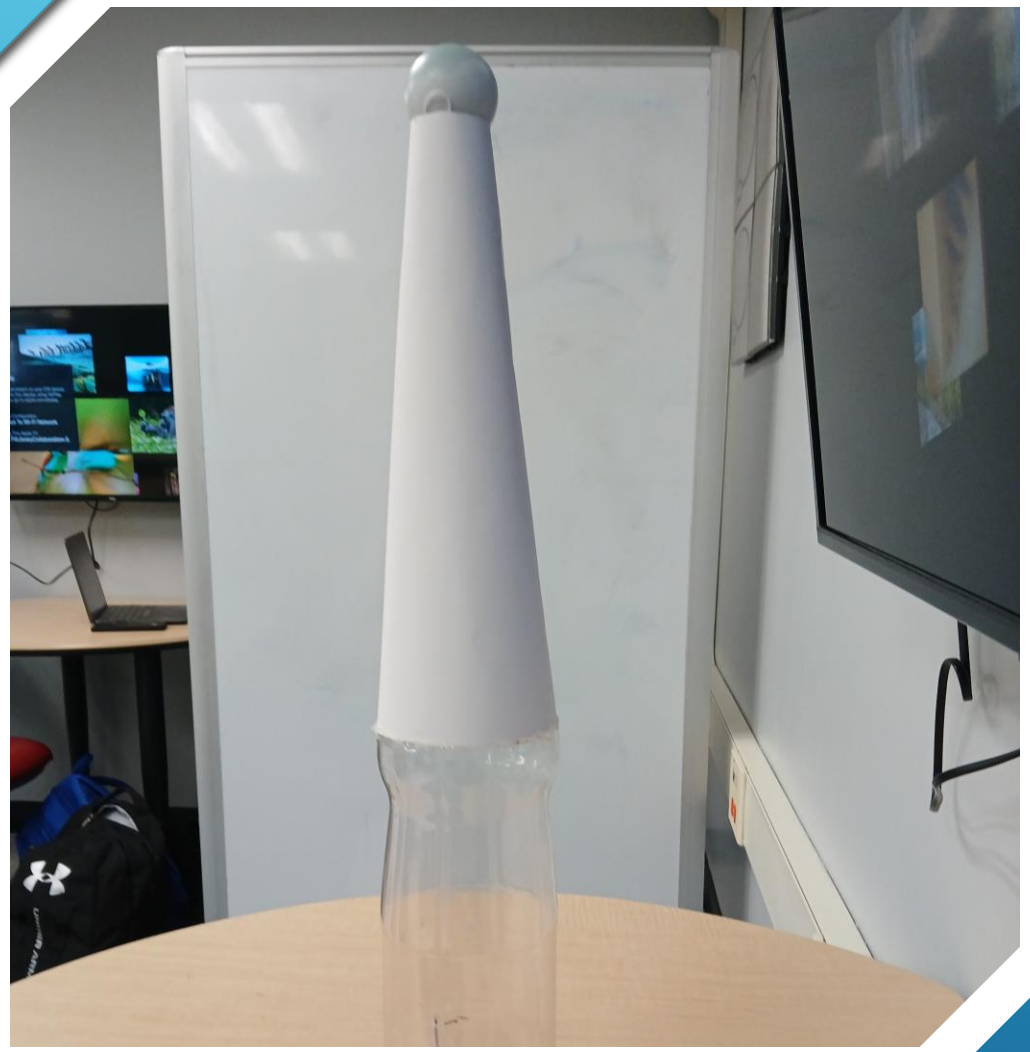

Ender

SHOWCASING STUDENT SUCCESS

Student Reflections

- "AutoCAD was kinda tricky at first, but now I can actually make my own designs for bridges and stuff. Feels pretty cool."
- "Building bridges is awesome. I'm learning how important planning and design really are."
- "I liked using AutoCAD because I could design stuff on the computer and then see it come to life later."
- "Working on bridges and tags made me feel like a real engineer. It's wild how something you make on a screen turns into something you can build."
- "Engineering 1 is cool because you actually get to build things you design yourself. It's way better than just reading about it."

LOOKING AHEAD



WHAT'S NEXT IN ENGINEERING 1

Mousetrap Car Project

This project explores energy transfer and efficiency through building and testing mousetrap-powered cars.

Water Rocket Design Project

Rocket design focuses on aerodynamics and thrust principles to build functional water rockets.

CO_2 Dragster

CO_2 Dragster introduces students to aerodynamics, design, and engineering principles through hands-on model car construction. Using AutoCAD, students will design their own dragsters, then build and test their creations to see how design choices impact speed, performance, and efficiency.

Preparing for Future STEM Careers

These projects build foundational skills and prepare students for Engineering 2 and STEM career challenges.

IMPACT

WHY ENGINEERING 1 MATTERS

Career Readiness

Engineering 1 prepares students for future careers by building problem-solving skills and practical knowledge.

Accessible Learning

The course offers an engaging, hands-on approach ideal for students who struggle with traditional academics.

21st-Century Education

Engineering 1 blends creativity and technical skills, embodying modern educational principles for today's world.

STEM Foundation

The course equips students with tools and mindset essential for success in evolving technological fields.

THANK YOU

THANK YOU FOR SUPPORTING STEM EDUCATION

Community Gratitude

We're grateful for our Board and community champions! Thanks to you, students are designing, building, and learning skills that will take them far.