

IDEA

Illinois Design Educators Association



IDEA Engineering Design Competition 2020

Career & Technology Education Organization Fundraising Product

Problem Statement:

Your friends are trying to help your high school's Career & Technology Education CTE club sponsor design a product that could be used to dispense and sell candy that can be sold at a profit to benefit the CTE club and its members. If your design is chosen they would like to make multiple dispensers for the other CTE sponsors to use in their classrooms. They know you are taking a high school engineering design class, will be attending college in the near future to study engineering and product design, and they have challenged you to solve this problem.

The problem is that the Career & Technology Education club needs you to design a product that they can manufacture and use to raise funds to support their various activities. They would like the product to dispense candy and collect money. The sponsor has determined that Air Heads and Blow Pops are student favorites, can be bought in bulk, sold for 25 cents each, and make a profit for the club. You are also being challenged to survey other students and determined 1 or 2 other candies that could also be sold using your dispenser. The majority of the money it will be collecting will come in as quarters. It should include your school's emblem/logo and the CTE club's initials. Your CTE clients have varying skill levels which must be taken into consideration when designing your dispenser and planning its production. Please keep safety a major consideration when planning your product and its manufacture. The members like to learn new skills, make projects, work as a team, and interact with the other students for sales. If your school has CTE based clubs please interview members or teachers to gather ideas. Survey these experts, classmates, family members, or industry members to gather ideas and brainstorm possible product solutions. The solution should be original and not a duplication of a current product.



Design Constraints:

The design must be:

- Must be easy to be manufactured by your clients.
- Must be able to be manufactured for under \$20.
- It will be a unique product, not a copy of an existing product—it may share common features.
- Colors on the product can show school and CTE club identity.
- Must consist of at least 6 parts- fasteners/screws/nails,etc are not considered to be parts.
- Must be durable, able to attach to a counter or desk, and not need teacher monitoring.
- Must fit into a design envelope with dimensions of 14 in. wide x 12 in. deep x 12 in. high.
- Must hold the 2 candy shapes- Airheads and BlowPops, and a third choice as determined by your research.
- The product must have a way to securely collect and store payments - it does not have to give change back.
- The product can be made of any material.

Procedure:

Your team, made up of 3 members, will focus on completing a product solution and presentation to present your firm's design solution to the client. Upon arrival to the IDEA competition, all members of the firm should come prepared to give a presentation of their project solution to a panel of judges. Your firm should arrive at the competition with the presentation and project solution completed ahead of time. The presentation should include:

Deliverables:

- Design solution/Product
- Engineering Notebook documenting the design process and your design solution.
- A Gantt Chart documenting the solution process and activities involved.
- A full set of engineering drawings for the solution using AutoCAD, Inventor, SolidWorks, etc.
- Bill of Materials-BOM
- Cost estimate-- Profit/Loss analysis
- Product plan of procedure or assembly instructions and visuals that your clients can follow.
- Packaging for the product.
- A prototype of your solution
- Any additional information or documentation needed to communicate the design solution.

Display:

- Display Board that is maximum of 28" X 40"
- Present your product with a medium of your choice.
- Title and description of the Engineering Design competition and your design solution.
- Documentation of the design process and your design solution

Presentation:

Your team will have up to 10 minute for the presentation of your product including your design, unique features of your design, estimated cost to produce, and lessons learned through the design process. A 5-minute question and answer period may/will follow your presentation.

Other documentation:

To be considered for an interview a resume and business card from each team member must be presented to the judges.

Judging Criteria:

Judges will rate the following criteria based off of information learned through the presentations and the design solution.

1. Quality and Clarity of Presentation	20%	20 pts
2. Quality of the Engineering Notebook	20%	20 pts
3. Functionality and Practicality of the Design Solution	20%	20 pts
4. Technical Quality of Documentation and Drawings	20%	20 pts
5. Technical Quality of Prototype	10%	10 pts
6. Meeting of Presentation Time Requirements	5%	5pts
7. <u>Resume & Business Card</u>	<u>5%</u>	<u>5pts</u>
	100%	100 pts

Each category above will be rated on a scale of one (poor) to max points (excellent).