

# IDEA

Illinois Design Educators Association



## IDEA Engineering Design Competition

2023

### Problem Statement:

Your friends are trying to help your high school's Prom Committee design a product that could be manufactured, packaged, used for marketing by the Committee and used as a prom gift. They know you are taking a high school engineering design class and will be attending college in the near future to study engineering and they have challenged your team to solve this problem.

The challenge is that the Prom Committee needs you to design a product that they can manufacture and use as a prom gift. The product will be using the solar cap from a solar light to power the product – see pic below. It could any kind of product that your team can come up with, but must use the solar cap. Please brainstorm and use survey input to make your final choice. The Prom Committee's skills must be taken into consideration when designing your product and planning its production. You must be able to involve 10-15 members in the production and assembly of your product. Please keep safety a major consideration when planning your product and its manufacture. Your team is available to assist if needed, but their involvement should be kept to a minimum. The Prom Committee members like to learn new skills, make projects, and interact with each other.

Each part must be assigned appropriate materials.

The design must be:

- Must be easy to manufactured by your clients.
- Must be affordable—under \$20
- It will be a unique product, not a copy of an existing product—it may share features.
- Colors on the product must be appropriate and should show school identity.
- It must be able to be personalized and based off your school's 2023 prom theme.
- It must consist of at least 6 parts- fasteners/screws/nails, etc. are not considered to be parts



## **Procedure**

Your team, made up of 3 members, will focus on completing a presentation and project solution to present and sell your firm's design 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 to the competition with the presentation and project solution made ahead of time. The presentation should include:

## **Deliverables:**

### Design solution:

- 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 minutes for 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 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 &amp; Business Card</u>	5%	5pts
	100%	100 pts

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