

# DESIGN PROBLEM RULES & CRITERIA

## DESCRIPTION:

Design problems are structured for teams of engineering students. The competing teams will receive details, tools, and materials necessary to develop a solution to a specific problem. Each team is responsible for bringing along the tools and materials noted on the enclosed list.

## TEAM:

Each team will be composed of three to five. One team member should be designated as the leader.

## PROCEDURE:

1. All members of a team must be present at the announced location and time for the start of the competition.
2. Each team will receive contest details, tools, supplies, and related materials necessary for a problem to be solved specifically for the competition. The solution to the problem must be created using the materials provided.
3. Each team will develop a solution to the problem by:
  - a. Brainstorming the problem and developing a list of possible solutions.
  - b. Identifying the solution that has the best potential for solving the problem.
  - c. Preparing a sketch of the device that is part of the selected solution.
  - d. Constructing the technological device that is part of the selected solution.
  - e. Testing and evaluating the device that is part of the selected solution.
  - f. Describing how the device solved the problem.
4. Each team will work in a designated area. All construction work must be done in the assigned area with the materials provided. Also, appropriate safety procedures must be followed during the construction and testing phases.
5. Forms for sketches and procedures will be provided and are to be turned-in for evaluation at the end of the contest.
6. The solution to the problem must be completed and tested within the time announced for the activity.
7. Instructors will evaluate the device built to solve the problem, related sketches and forms, and will witness the actual solution to the problem.

8. Each team is responsible for cleaning-up their area at the end of the contest.

## TOOL AND MATERIAL LIST

### Basic Kit

A basic material kit will be provided to each team. The contents of the kit may vary depending upon the design challenge for that site. The standard kit will include the following:

Ping-pong ball	Steel washers	Contact paper
Golf ball	Straight pins	Balloons
Pulley	String	Nails
Tongue depressor	Thumb tacks	Velcro
Popsicle stick	Index cards	Hinge
Candle	Skewers	Soda straws
Mouse trap	Paper clips	Pipe cleaners

### On-Site Supplies

On-site items will be provided, depending on the specific challenge. Examples of these materials are listed below:

(1) $\frac{3}{4}$ or 1" 12" X 24" foam insulation bd.	(3-5 each) 8, 10, or 16 oz. paper cups
(2) each) $\frac{1}{4}$ " and $\frac{3}{8}$ " dowel	(10 sheets) white bond paper
(3) small pieces corrugated board	(5) file folders
(1 small cupful) sand	

### Team Tools and Supplies

The following items must be provided by each team and includes the only tools that may be used regardless of the specific design problem:

Utility knife	Scissors	Hot wire (Styrofoam) cutter
Coping saw	Pencils	Masking tape ( $\frac{3}{4}$ " or 1")
Needle nose pliers	Tape rule	Clear tape ( $\frac{1}{2}$ " or $\frac{3}{4}$ ")
Rulers	White glue	Matches / lighter
Triangles (30/60 & 45)	Hot-glue gun	Calculator
Sander	Portable drill & bits	

### Special Supplies

Special supplies required to solve the design problem may be provided each team.