

ME 470 Systems Design On the Spot Design

Goal: To work through the Design-Build-Test stages in the design process with particular emphasis on creativity/ideation and execution.

Task: To deliver a penny as close as possible to a destination point that is a distance of 20 inches from the starting line.

Design Constraints

Materials:

Only materials issued by the instructors can be used. Each group will be supplied with a bag containing

- One penny
- 4 rubber bands
- 6 - 3x5 cards
- 3 drinking straws
- 1 foot of masking tape
- 1 plastic spoon
- 2 craft sticks
- 2 paper clips

Time:

- Twenty minutes of class time will be used to assemble your apparatus (using a previously developed design), followed by competition with groups called randomly.
- Setup time will be no longer than 2 minutes (1 point penalty of every two seconds beyond this time). (Since an apparatus can be preassembled, setup consists of locating the assembly at the starting line.)

Space:

- The target will consist of one inch wide concentric rings surrounding a two inch diameter “bullseye” on a sheet of paper taped to a classroom table.
- The starting line will consist of a strip of masking tape whose edge is 20 inches from the center of the target.
- The apparatus must have a footprint no larger than one square foot and must initially all be located behind the front edge of the starting line.
- Attachment of the apparatus to the table can only be made by masking tape.

Energy:

- Energy can be stored in the issued materials prior to the activation of the device (e.g. rubber bands can be stretched/twisted).

- After the apparatus is assembled and located, human force or energy can only be used to activate or trigger the device (e.g. release a weight, pull a pin, cut/remove tape, ...); and cannot be used as motive force for the penny.

Tools:

You may use and tools/supplies that you bring to class, but only the materials supplied by the instructor may be included in the apparatus.

Safety

No open flames, toxic materials, unsafe tool handling ,...

Scoring:

- **Bulls eye** **100pts**
- **Ring 1** **90 pts**
- **Ring 2** **80 pts**
- **Ring 3** **70 pts**
- **Ring 4** **50 pts**
- **Penney fails to move** **0 pts**

Rule enforcement

- The course instructor will be the final judge on all rule interpretation.

