



Junior Engineering

The Engineering competition is designed for a team of three to five students to use innovative problem solving techniques and engineering concepts. Teams will use items from a specified list and will be required to interact with judges during the competition. A club may have only one entry.

****Time Limit: 45 Minutes ****

Competition Guidelines

Junior Construction - Rollercoaster

- Each club may enter one team of three to five students.
- Teams will be given forty-five (45) minutes to construct and ninety (90) seconds to demonstrate and explain the project.
- The invention must be constructed on a piece of foam board 30 inches by 40 inches. This piece of foam board will be separate from the materials container.
- The invention may have parts that suspend beyond the board, but cannot be braced/tethered/supported by anything (i.e. wall or floor) other than the board.
- The team must use items from the specified list and materials must fit into a closed 10 gallon plastic storage container with a lid.
- All construction must be done on-site. No steps can be preassembled, construction pieces must be separate and the board must be free of any writing or marks. Electricity will not be available.

Educational Connections

- Engineering and Innovation
- Communication and Collaboration
- Critical Thinking and Problem Solving

- Scale and Measurement
- Science, Technology, Engineering, the Arts and Mathematics (STEAM)
- Students will investigate and find solutions, designs, and strategies from an infinite number of possibilities using inquiry, collaboration, and process-based learning.

Approved Materials List

The team must use ONLY the items from the specified list of materials below. Materials must fit into a closed 10 gallon container with lid. Teams will be responsible for all materials and the foam board needed for the build.

Approved Materials		
Thread spools	Cans	Toothpicks
Toothbrushes	Index cards	Paper clips
Sandwich bags	tongue depressors/popsicle sticks	Boxes
Matchbox car	Newspaper	Playing cards
Marbles	Aluminum foil	Paper plates
Dice	Egg cartons	String
Tape	Adhesives	Balloons
Rubber Bands	Paper Fasteners	Scissors
Straws	Wheels	Modeling Clay
Tinker Toys	Zip Ties	Magnets
Cotton Balls	Card Stock	Batteries
Battery operated glue gun with glue sticks	Balls (plastic, metal, rubber)	Cups (paper, plastic, or styrofoam)
Plastic Toys (to include K'inex and Construx)	Cardboard	Cork

Spoons	Plastic Bottles	Dried Beans
Clothes Pins	Ruler	Shoelaces
Dominoes	Pipe Cleaners	Wire
Cardboard Tubes	Legos	Writing Utensils

How to Enter

- Visit www.betaclub.org/events/conventions and follow directions.
- Register students and then select competitions to enter.
- Bring 30” by 40” foam board and container of materials to convention.

National Eligibility

All Plaques Awarded at State Convention

Judging Criteria

Engineering	16-20	11-15	6-10	1-5
Complexity	Structure displays excellent complexity of the steps used in the build.	Structure displays good complexity of the steps used in the build.	Structure displays average complexity of the steps used in the build.	Structure displays minimal complexity of the steps used in the build.
Creativity	Structure exhibits excellent creative solution in all aspects of the challenge.	Structure exhibits good creative solution in all aspects of the challenge.	Structure exhibits average creative solution in all aspects of the challenge.	Structure exhibits minimal creative solution in all aspects of the challenge.
Critical	Students exhibit excellent ability to consider alternatives to	Students exhibit good ability to consider alternatives to	Students exhibit average ability to consider alternatives to	Students exhibit minimal ability to consider alternatives to

Thinking	the design and construction during the process.	the design and construction during the process.	the design and construction during the process.	the design and construction during the process.
Team Communication	Displays excellent communication and collaboration throughout the entire process.	Displays good communication and collaboration throughout the entire process.	Displays average communication and collaboration throughout the entire process.	Displays minimal communication and collaboration throughout the entire process.
Overall Quality	Structural integrity and demonstration of challenge are excellent.	Structural integrity and demonstration of challenge are good.	Structural integrity and demonstration of challenge are average.	Structural integrity and demonstration of challenge are minimal.
Deductions	This will be taken one time by the coordinator.	<i>Did not follow competition guidelines -10</i>		

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