



Mission Possible

Description	Teams must design, build, test and document a Rube Goldberg like device that completes a required final task using a sequence of consecutive tasks.
Time Limit	30 minutes to set up, 1-3 minutes to run machine (5-8 days to build and test your machine)
Team Size	Up to 3 students
Details	<ul style="list-style-type: none"> ➤ Devices with potential safety hazards or concerns will not be permitted to run. ➤ All parts of the machine must fit in an imaginary cube that is 100 cm x 100 cm x 100 cm. This does not include the motion of the final task. ➤ The device must be designed and constructed to carry out a sequence of tasks from the list below. ➤ The starting task and ending task must be the same for all teams. ➤ Teams may choose up to 8 other tasks to include in their machine. You must have a minimum of 3 other tasks. ➤ After the starting task, the machines must run on their own with no human interaction. ➤ Dead end tasks are not allowed, each task must initiate another task (except for the final task). ➤ Each moveable/adjustable object in the machine may only be used for one task. ➤ Electric components are limited to batteries, wires, switches and up to 3 motors. (switches and motors must be provided by student) ➤ All tasks must be viewable by the teacher. ➤ Teams must make a task sequence list that both describes and numbers the tasks included in their machine. Each task must also be labeled (by number) on the device itself.
Tasks	<ul style="list-style-type: none"> ➤ Starting Task: Initiate the first action by dropping a US quarter into the device from a position higher than the highest point on the device. ➤ Final Task: Raise a balloon higher than any other part of the device. ➤ Other Task Options <ul style="list-style-type: none"> ○ Open a closed plastic egg so the contents fall out and start the next action.



	<ul style="list-style-type: none"> ○ Use the force of moving air to push an object at least 10 cm. This change in position must start the next action. ○ Turn a screw so that it moves an object a minimum of 2 cm and starts the next action. ○ Release the energy stored in a spring such that it starts the next action. ○ Use a pulley system to raise an object at least 5 cm before it starts the next action. ○ Combine two levers of different classes to lift an object so the object starts the next action. ○ Use a rack and pinion gear to move an object at least 5 cm before it starts the next action. ○ Lift an object with a 3rd class lever at least 10 cm before it starts the next action. ○ Move and pour a granular material from one container to another. This movement must start the next action. ○ Use a gear system of at least three gears to move an object that starts the next action. ○ Pull a mass up a ramp a distance of at least 10 cm. The movement of this mass must start the next action.
Competition Scoring	<ul style="list-style-type: none"> ➤ Points will be awarded for each task completed successfully with bonus points for extra tasks. ➤ Total points: Approximately 80
Notebook Requirements	<ul style="list-style-type: none"> ➤ Mission Possible Design Notebook ➤ Notebook Points: 20 points
Timeline	<p>Building and Testing Dates:</p> <p>Competition Date:</p>

