

RUBE GOLDBERG MACHINE

Rube Goldberg was an American cartoonist of the early 20th century. He drew cartoons that exemplified the most inefficient means of completing a task. Here is a web page with an example carton, http://www.rubegoldberg.com/gallery_01.php . (The British have their version of “Rube Goldberg” style artist. His name was Heath Robinson.)

Complete this activity before building your Rube Goldberg Machine. It will be due weeks before the contest.

Before the contest, you will build and turn in an electrical circuit in a Rube Goldberg fashion. You are to build a battery powered device, “bpd,” that is remotely controlled. This means you will have a wire carry the electricity to a motor or other electrical power device.

- You may **NOT** use any voltage that add up to greater that 9 volts.
- **No** car/lawn mower or motorcycle batteries.
- **NOTHING** CAN BE PLUGGED INTO THE WALL.

Most any **b**attery-**p**owered **d**evice, (“bpd,”) is easy to control via remote. Your remote controlled device must meet the following criteria.

- “Remote control,” means the on/off switch is at least 12 inches away from the bpd. Think of it as a pair of wires at least 12 inches long between the on/off switch and the bpd.
- The bpd must be a battery operated motor from a toy or a motor purchased separately, a toy car, or any other toy that fits you machine’s needs.
- The switch cannot be turned on or off by a human.
- What you make must be used in your final machine. This will be part of what you build – the switch and the step leading to it being turned on. See the web page regarding how to make remotely controlled bpd, www.mrwaynesclass.com/ProjectRube/remote. (Capitalization is important.) is This page also has few hints in the summary section of the animation.
- You will turn in a working mechanism. A working mechanism meets these requirements.
 - Working switch.
 - Working remotely controlled battery powered device
 - The device is supposed to do something besides spin a wheel or make noise. Show what the battery-powered device is to do.

The final Rube Goldberg Machine –building rules.

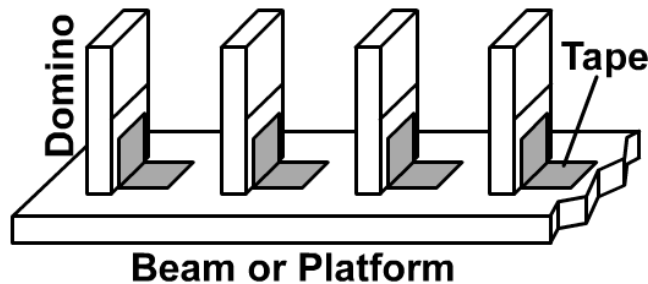
For your final Rube Goldberg Machine, you will build a device whose goal is to put toothpaste on a toothbrush. Your machine must be secured to a base of foam core or wood no larger than 20” x 30”. Your device must have at least 8 sequentially working steps.

A working step is defined as a triggering that causes an action. See the web site www.mrwaynesclass.com/ProjectRube/steps to see an animation describing how a “step” is defined.

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You will be provided with paper columns and beams that can be used to build a base from. You are not required to use our paper columns and beams -but you must use something.

Hint: Many people like to use dominos in their device. But they are time intensive to set up. Here is a method for resetting dominos quickly. Tape down one side of each domino to act as a hinge.



RULES:

1. Contestants are allowed to work in teams of up to 2 people. You may work with anyone in any physics class at AHS.
2. The machine does not have to automatically reset itself.
3. You need to be able to set up your machine for the contest in under 2 minutes.
4. The machine should complete its task within 4 minutes.
5. Points awarded are based upon:
 - Number of steps
 - Turning in a list of the machine's steps
 - Creativity of steps
 - Number of times you give the machine help -this deducts points.
 - Machine's Design Creativity
 - Following the rules
 - Setting up and removing the machine according to the established times.
5. **NO** explosives, fire, CO₂ cartridges, smoke, knives, razor blades, dangerous flying objects, or dangerous/toxic chemicals are allowed. When in doubt, ask before building.
 - You may not use anything that plugs into a wall outlet. Battery power adding up to less than 9 Volts is all that is allowed. No car, motorcycle or lawn mower batteries are allowed.
 - Your machine may not incorporate any living animals, e.g. hamsters, guinea pigs, domesticated goldfish, feral goldfish, baby elephants, etc.
6. The contest is run during the class period that either you or your partner has physics.
7. No humans may touch your machine after you have started its motion. (It is expected that you will touch it for it to begin working.)
8. Points are awarded if the device is set up at the beginning of class and removed from the room by 3:30 on the day of the contest.
9. No commercial products such as the game "Mouse Trap" are allowed.

Bonus Points:

- Having a clearly identifiable theme.
- Impressing the judges with a unique or clever trigger/event combination.
- Most number of steps.