Rube Goldberg Project

Engineering is all about doing projects – brainstorming ideas, researching and experimenting, managing your time and resources, working in teams, communicating your results. The main part of this class is a quarter-long, hands-on team project. In the first week you will divide into teams of four or five people and choose one of the following two projects.

1. **Build a Rube Goldberg contraption** to accomplish a simple task of your choosing by the most complicated means possible. Projects will be judged on creativity, clever use of simple materials and the maximum number of steps to reach the goal. The constraint is that at least three electrical engineering elements must be included. For example, these could be using the dc motor to turn or move something, using a sensor to trigger a switch, using a digital logic circuit, an electromagnet, a timer, etc. If you are not familiar with Rube Goldberg machines, here are some (more elaborate) examples:
   - [http://www.youtube.com/watch?v=lCYg_gz4fDo](http://www.youtube.com/watch?v=lCYg_gz4fDo) from the Mythbusters TV show
   - [http://www.youtube.com/watch?v=8zN0J_JFFi0](http://www.youtube.com/watch?v=8zN0J_JFFi0) a high school class project
   - [http://www.youtube.com/watch?v=1kvdq8cRNBM](http://www.youtube.com/watch?v=1kvdq8cRNBM) an elaborate one from a Japanese competition

   Many more can be found online. For information on Rube Goldberg and the history of the competition, see [http://en.wikipedia.org/wiki/Rube_Goldberg](http://en.wikipedia.org/wiki/Rube_Goldberg).

2. **Take engineering to middle school**. Create: (i) a short lively presentation on EE for a middle school class and (ii) a hands-on activity to do with the class. This would be an experiment that the students would, in theory, do themselves, but for the purposes of this project your team will demonstrate it to the class. These projects will also be judged on creativity and use of materials, but also on how they engage the attention of middle-schoolers and inspire them to stay in school, take math and science courses and pursue engineering, particularly electrical engineering, as a career.

   For either project, some materials will need to be purchased. Each team will have the free use of a lab kit for the quarter, and those components can also be used in the project. I would estimate roughly that about $10 per person should cover additional materials.

   For either project, a written report as well as a presentation/demonstration are required. To make things more interesting, we will make this a friendly competition. The class will vote for the best project and the winning team will win a small prize.