

# Rube Goldberg Project

**Overview:** The goal of the Rube Goldberg Project is to help students see how energy is constantly changing forms but always conserved. By learning a bit about Rube Goldberg and creating their own Rube-Goldberg-machine students will become familiar with how energy transforms from one form to another and be able to track how energy flows through a system. It is also an opportunity to practice teamwork, leadership, and organizational skills. Lastly it is a chance to be creative and have some fun in the process.

**Scope of Work:** In groups of 4, students will design and create a working Rube Goldberg machine that performs a task of their choice. Each group will create a report that describes their machine and maps out how the original energy put into the machine transforms from one form to another as the machine operates. Once the machines are complete, they will be brought to a Trade Show where each group will give a marketing presentation and demonstrate the machine to potential investors. Students will then have an opportunity to invest in any company's machine they like.

**What You Will Deliver (and how much of the grade it will count for):**

*(25%) Machine* – A Rube Goldberg machine that performs some function.

*(25%) Report* – Groups will produce a report which explains their machine.

*(25%) Presentation* – Given on the day of the Trade Show.

*(25%) Self and Peer Evaluation* – Students will evaluate themselves and their teammates with regard to their contribution and the effort they put into the project.

**Roles:**

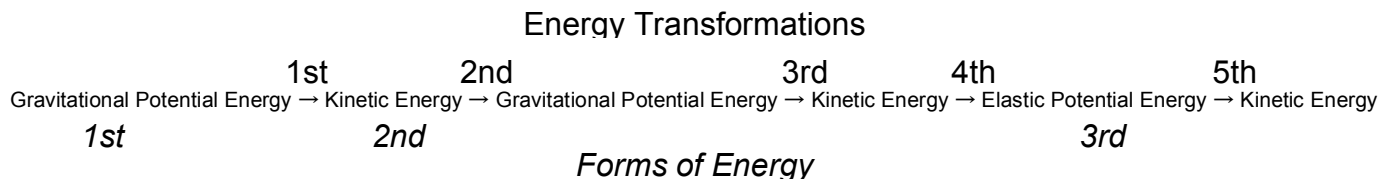
There are 4 roles available to group members. Each role corresponds to managing a certain area of the project. These roles DO NOT mean that the person in the role is responsible for completing the entire task. Rather, that person is responsible for making sure that the task gets done (that is why each role is referred to as a manager).

1. **Design Manager** – This person is responsible for managing the design of the machine. Remember, this does not mean designing it alone, just managing the design process. This may include overseeing the production of diagrams.
2. **Production Manager** – This person is responsible for managing the production of the machine. Remember, this does not mean they build it alone, but managing the production process. This may also include overseeing the production of Energy Pie charts.
3. **Financial/Personnel Manager** – This person is responsible for management of groups financial resources (no more than \$10 may be spent in the construction of your machine). In addition they are responsible for making sure the group is communicating and coordinated (may include arranging meetings outside of class)
4. **Data Manager** – This person is responsible for managing all the data which must be put into the report. Remember, this does not mean producing all the data, just making sure it all gets done and compiled into the final report.

## **Requirements:**

### **The Machine must:**

1. Perform its function during the presentation.
2. Have a footprint no larger than 2'X2' (space is limited in the Trade Show)
3. During its operation transform the ORIGINAL energy at least 5 times (utilizing at least 3 *different* forms of energy). For example, your machine may have the following energy flow:



### **The report may be in any of the following forms:**

1. Paper
2. Powerpoint Presentation
3. Webpage

### **The report must include:**

1. The name of your creation and/or company prominently displayed.
2. An image of the machine (photographic, or drawn).
3. A description of what the machine does.
4. A detailed diagram (or multiple diagrams) which illustrates using pictures and words how the original energy “flows” through the machine (how it is transformed into different forms as the machine operates).
5. Pie charts *estimating* the amounts of energy in each form at three different stages of the machine’s operation.
6. An employee roster which tells what each person’s role was and what they contributed to the project.
7. An expense report detailing all the elements of the machine, where they were procured, and their price.
8. A short conclusion discussing what you learned from the project.

### **The Presentation must:**

1. Introduce your machine and its function.
2. Include a working demonstration of the machine.
3. Explain how the energy flows through the machine during its operation.
4. Be no longer than 3 minutes.