

Rube Goldberg Machine Science Project

The Rube Goldberg Machine Contest (RGMC) brings the ideas of Pulitzer Prize-winning artist Rube Goldberg's "invention" cartoons to life. This Olympics of Complexity is designed to pull students away from conventional problem-solving and push them into the endless chaos of imagination and intuitive thought. To be specific, groups are given an elementary challenge: something as simple as peeling an apple, sharpening a pencil, or putting toothpaste on a toothbrush. But instead of just "solving" the problem, students have to make the solution as complicated and as convoluted as possible. In fact, the more steps - there's a minimum of ten - the better the Rube Goldberg Machine. And what a machine! An assemblage of ordinary objects, mechanical gadgets, and the oddest odds and ends are linked together and somehow get to the desired goal.

Rube Goldberg Project Rules and Regulations

- The machine must have a minimum of ten (10) unique steps. There is no maximum number of steps. Note: 10 steps is a minimum; more steps will earn more points.
- The machine must run for no more than two (2) minutes per run.
- Students will present a video of the final project to the class. This video must detail each of the steps, narrated by the student, and then demonstrate the working machine.
- No live animals may be used in the machine.
- The machine must not imply profane, indecent or lewd expressions.
- Any loose or flying objects must remain within the set boundaries of the machine. This includes, but is not limited to, drops of water, slivers of balloon, and other "small" objects. Steam and other gases are exempt from this rule.
- No flames may be used on or within the machine.
- No hazardous materials or explosives can be used on or within the machine.
- The project must be safe to the satisfaction of your teachers. Teachers must approve any questionable items prior to presentation.

Team Restrictions

- No more than 2 students per team.
- Projects must have a minimum of 15 steps.
- **Team grievances will not be handled within the classroom; understand the risks and benefits of having a partner before choosing one.**

Class Demonstration Time

- All project videos will be due within a given time window. If you do not have easy access to a video recording device, be sure to get an EARLY start!
- Videos must be digital. You can bring them on a flash drive, DVD, CD, or bring the video device WITH the appropriate cables to transfer to computer. If you need assistance, see your teacher **EARLY**...WAY before it's due!!!
- A typed copy of a numbered step-by-step description of the project must be submitted to the teacher by the due date and must include the following.
 - An introduction explaining the goal of the project, its size, basic working functions including relation to force and motion;
 - Conclusions about the successes and/or failures of the putting together of the project;
 - A picture or detailed diagram of the project;
 - Numbered step-by-step description of the steps in the project.

~ Project RUBE-ric ~

**Final Project due by
March 08, 2012**

Student: _____

PreAP Science-8 ~ Period: _____

Teacher: _____

| | 4 | 3 | 2 | 1 | 0 |
|--|--|--|---|--|--|
| Judge ~ Works (x4) | Works the 1st time through with no outside assistance | Works with minor assistance | Fails 1st attempt or needs major assistance; works on 2nd attempt | Works on 2nd attempt with assistance | Does not work |
| Judge ~ Materials stay in area (x3) | All parts remain within dimensional area | a part rolls/shoots slightly out of dimensional area | more than 1 part leaves dimensional area | many parts move some distance from project | Parts fly off in a hazardous manner |
| Judge ~ # of unique steps (x2) | 15 or more steps (20 for team) | 10 steps (15 for team) | 7-9 steps (11-14 for team) | 4-6 steps (7-10 for team) | less than 4 steps (less than 7 for team) |
| Judge ~ Time (x1) | less than 2 min | between 2 min and 2 min 10 s | between 2 min 11 s and 2 min 30 s | between 2 min 31 s and 3 min | greater than 3 min |
| Paper ~ Introduction (x2) | includes solid goal, size info, and understandable working functions | 2 of 3 parts included and is understandable | missing a part and some difficult to understand | only has 1 part and/or hard to understand | missing |
| Paper ~ Conclusions (x3) | discusses learning from failures and successes | discusses failures and successes | only discusses success or failures | no valid conclusions are drawn | missing |
| Paper ~ Step Description (x3) | all steps are covered clearly and concisely and; all are numbered | steps are numbered; most are detailed clearly | steps are not detailed or numbers missing | steps written in paragraph form, not detailed or clear | missing |
| Paper ~ Image/Diagram | titled; all steps labeled and easy to read | missing title; most steps clearly labeled | missing title or less than half steps labeled or none labeled clearly | present with no labels or title | missing |
| Paper ~ grammar & spelling (x1) | no errors | 1-3 errors | 4-6 errors | 7-9 errors | 10 or more errors |

Score/80: _____ x 1.3 = _____ /100

Dear Parent,

We would like to inform you that your PreAP Science student will begin working on a Rube Goldberg machine project this month and will continue through March. This project will bring the ideas of Pulitzer Prize-winning artist Rube Goldberg's "invention" cartoons to life. To be specific, students will choose a simple, routine type of task and make it complex. The task goal will be chosen from one of the three listed below, but instead of just "solving" the problem, students have to make the solution as complicated and as convoluted as possible. In fact, the more steps the better the machine. Basically, the Rube Goldberg machine is made of ordinary objects, mechanical gadgets, and other common materials linked together to somehow achieve the desired goal.

Your child will be expected to adhere to the due dates, rules, and regulations he or she has been given. Every student has been given a rubric outlining the scoring policy. Students should refer to this rubric often to confirm they are meeting expectations. Students are allowed to work with a partner, but have been informed of the risks and benefits. Teachers will not be responsible for solving problems that can occur when working with a partner.

To help your child succeed on this project, please be aware of the due dates, rules, and regulations. It is not necessary to purchase items for this project—we prefer students to find simple machines and materials around their house to use. If you or your child have any questions, please feel free to contact his or her Science teacher prior to a due date. We appreciate the encouragement and support you will provide throughout this project!

Sincerely,
Blalack Science Department

Rube Project Theme Choices

- (1) 2012 Rube Goldberg national machine contest theme of **"Inflate A Balloon and Pop It!"** [eligible for national contest entry]
- (2) Select, Crush and Recycle and Empty Soft Drink Can
- (3) Assemble a Hamburger

Rube Goldberg Machine Science Project ~ 2011-2012 Timeline
(subject to change as needed)

| | |
|-------------|--|
| OCTOBER 07 | Introduction and start of project |
| OCTOBER 28 | 2 (3 if team) stages of project must be submitted to teacher via image/diagram |
| NOVEMBER 18 | 4 (6 if team) stages of project must be submitted to teacher via image/diagram |
| JANUARY 06 | 6 (9 if team) stages of project must be submitted to teacher via image/diagram |
| JANUARY 27 | 8 (12 if team) stages of project must be submitted to teacher via image/diagram |
| FEBRUARY 17 | 10+ (15+ if team) stages of project must be submitted to teacher via image/diagram |
| MARCH 08 | Completed Introduction and Description of working project is due with video to teacher |

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Please cut and return the bottom portion to your Science teacher
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We have received and understand the expectations and timeline for the PreAP Rube Goldberg Project.

Parent Signature / Date

Student Signature / Date

Student _____ Science Teacher _____ Period _____
(Print) (Print)