

Name: _____ Date: _____ Period: _____

Rube Goldberg

Who is Rube Goldberg?

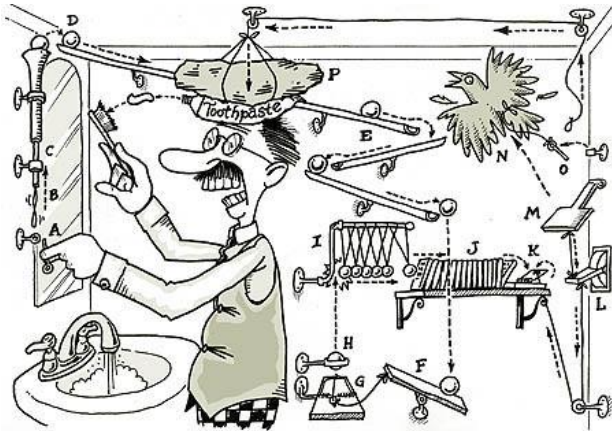
Rube Goldberg (1883-1970) was a Pulitzer Prize winning cartoonist, sculptor and author. Reuben Lucius Goldberg (Rube Goldberg) was born in San Francisco on July 4, 1883. After graduating from the University of California Berkeley with a degree in engineering, Rube went on to work as an engineer for the City of San Francisco Water and Sewers Department.

After six months Rube shifted gears and left the Sewers Department to become an office boy in the sports department of a San Francisco newspaper. While there he began to submit drawings and cartoons to the editor until he was finally published. Rube soon moved from San Francisco to New York to work for the Evening Mail drawing daily cartoons. This led to syndication and a national presence – and the rest is history.

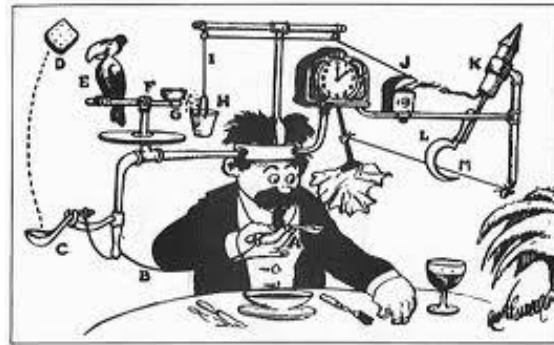
A founding member of the National Cartoonist Society, a political cartoonist and a Pulitzer Prize winner, Rube was a beloved national figure as well as an often-quoted radio and television personality during his sixty year professional career.

Best known for his “inventions”, Rube’s early years as an engineer informed his most acclaimed work. A Rube Goldberg contraption – an elaborate set of arms, wheels, gears, handles, cups and rods, put in motion by balls, canary cages, pails, boots, bathtubs, paddles and live animals – ***takes a simple task and makes it extraordinarily complicated.*** He had solutions for How To Get The Cotton Out Of An Aspirin Bottle, imagined a Self-Operating Napkin, and created a Simple Alarm Clock – to name just a few of his hilariously depicted drawings.

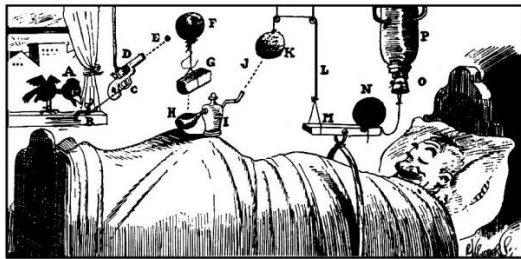
Rube Goldberg Examples



Self-Operating Napkin

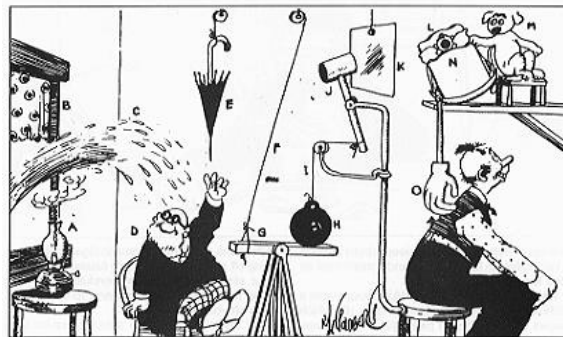


Simple Alarm Clock



The early bird (A) arrives and catches worm (B), pulling string (C) and shooting off pistol (D). Bullet (E) busts balloon (F), dropping brick (G) on bulb (H) of atomizer (I) and shooting perfume (J) on sponge (K)—As sponge gains weight, it lowers itself and pulls string (L), raising end of board (M)—Cannon ball (N) drops on nose of sleeping gentleman—String tied to cannon ball releases cork (O) of vacuum bottle (P) and ice water falls on sleeper's face to assist the cannon ball in its good work.

An Automatic Back Scratcher



EASY WAY FOR TIRED TOURIST TO ENJOY ITALIAN ART

6-28

RUBE GOLDBERG
FLORENCE, ITALY

THIS WAS PAINTED BY BOTTICELLI IN 1499.

<p>STRAND OF SPAGHETTI (A) GOES THROUGH TOWER OF PALAZZO VECCHIO (B) GETTING TANGLED IN WHEEL OF BICYCLE (C) —</p>	<p>CHAMPION RIDER (D) LANDS ON BOTTLES OF CHIANTI (E) SCATTERING RED WINE IN ALL DIRECTIONS —</p>	<p>MAN GETTING SHAVED (F) THINKS HE IS CUT AND JUMPS OUT OF BARBER CHAIR, PULLING TRIGGER (G) AND SHOOTING EAR PLUGS (H) INTO EARS OF AMERICAN TOURIST (I) —</p>	<p>THIS PREVENTS HIM FROM HEARING WHAT THE GUIDE IS SAYING SO HE WILL NOT HAVE ANY INFORMATION TO BORE HIS FRIENDS WITH WHEN HE GETS HOME.</p>
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Rube Goldberg Challenge

Task:

- Your task is to select one of the six Rube Goldberg projects below and design and build a Rube Goldberg Machine that takes the simple task and makes it extremely complicated.

Option 1: Select, Crush and Recycle an Empty Soft Drink Can

Option 2: Shut Off an Alarm Clock

Option 3: Water a Plant

Option 4: Put Toothpaste on a Toothbrush

Option 5: Inflate a Balloon & Pop It

Option 6: Select your own task. Task must be approved by Mr. Young

Group:

You may work individually or in a group of up to five on this assignment. Your partner or partners can include students from different classes but must be on team 8-1. I strongly encourage you to choose your partner or partners wisely; as this project will be completed outside of class and require group members to meet and work outside of school. **IN ADDITION THIS IS YOUR ASSIGNMENT, NOT YOUR PARENT'S ASSIGNMENT. THE EXPECTATION IS THAT YOU ARE DOING THE WORK.**

Presentation:

What you will need to bring to class for the final presentation on **Friday, December 12th**:

- The Contraption:
 - You have to show your Rube Goldberg Machine to the class and explain how it works. You can physically bring your machine into class (I strongly suggest), send me a video or post a video to YouTube. If you make a video all steps, contact forces, non-contact forces and potential energies should be visible in your video.
- Rube Goldberg Diagram:
 - Diagram should include:
 - A labeled illustration of your Rube Goldberg Machine.
 - The identification of all the materials, contact forces, non-contact forces and simple machines used in your project, as well as a list of steps that occur in your project.

- .A written detailed description of how your Rube Goldberg Machine works. Including a detailed description of how you used your contact forces, non-contact forces and simple machines to complete your task.

Machine Specifications:

1. Minimum of 20 steps _____

* What is a step?

Answer: A step in the machine is a transfer of energy from one action to another action. Identical transfers of energy in a row should be counted as one step.

Example: A sequence of dominos hitting each other should be counted as one step. Counting 100 dominos as 100 steps is repetitive and not in the spirit of Rube Goldberg.

2. Minimum of 3 different simple machines. _____

3. Must use each of the following contact forces **at least once** to aid in the completion of your task:

* Applied force _____

* Friction _____

* Air Resistance or Drag _____

4. Must use **at least TWO** of the following non-contact forces to aid in the completion of your task:

* Gravitational Fields _____

* Magnetic Fields _____

* Electrical Fields _____

> Generators

> Motors

5. Must use both **Gravitational** and **Elastic Potential Energy** to aid in the completion of your task. _____

6. From start to finish your machine should complete the task within 2 minutes.

7. **Have Fun** 😊😊😊

Suggested Materials:

- You will need materials to build your Rube Goldberg machine. Some possibilities include wood scraps of all sizes, cardboard and plastic tubes, nails and screws, coat hangers, straws, spools, cups, cans, wire, toy wheels, toy cars, string, paper clips, and cardboard. You may also use other materials that are appropriate. If you have a question about what materials are appropriate ask Mr. Young.
- **There is no need to buy expensive materials, use what you have available to you at home.**

Parent Signature:

I understand that my son or daughter:

- Is building a Rube Goldberg machine that can perform one of the six tasks above.
- Has the option to work individually or in a group of up to five people.
- Can work with anyone on team 8-1.
- Will design and build their Rube Goldberg machine **OUTSIDE OF CLASS.**
- Will present their Rube Goldberg machine on **Friday, December 12th.**
- Can film their Rube Goldberg machine and bring the recording to class or can bring in their actual project.

Please sign and return:

If you have any questions about the Rube Goldberg Machine Challenge please email me at mfyoung@mevsd.us .

Rube Goldberg Challenge: Paper Rubric

Members: 1.

2.

3.

4.

5.

CATEGORY	10	8	6	4
Materials	All materials and setup used in the experiment are clearly and accurately described.	Almost all materials and the setup used in the experiment are clearly and accurately described.	Most of the materials and the setup used in the experiment are accurately described.	Many materials are described inaccurately OR are not described at all.
Simple Machines	Rube Goldberg machine utilizes 3 or more different simple machines. In addition each simple machine is identified and labeled.	Rube Goldberg machine utilizes 2 different simple machines. In addition each simple machine is identified and labeled.	Rube Goldberg machine utilizes less than 2 different simple machines. However, the simple machine is identified and labeled.	Rube Goldberg machine utilizes less than 2 different simple machines. Simple machines are not identified or labeled.
Contact Forces	All forms of energy used in the Rube Goldberg machine are clearly and accurately described.	Almost all forms of energy used in the Rube Goldberg machine are clearly and accurately described.	Most of the forms of energy used in the Rube Goldberg machine are clearly and accurately described.	Many forms of energy used in the Rube Goldberg machine are described inaccurately OR are not described at all.
Non-Contact Forces	All energy transformations in the Rube Goldberg machine are clearly and accurately described.	Almost all energy transformations in the Rube Goldberg machine are clearly and accurately described.	Most energy transformations in the Rube Goldberg machine are clearly and accurately described.	Many energy transformations in the Rube Goldberg machine are described inaccurately OR are not described at all.
Potential Energy	Procedures are listed in clear steps. Each step is numbered and is a complete sentence.	Procedures are listed in a logical order, but steps are not numbered and/or are not in complete sentences.	Procedures are listed but are not in a logical order or are difficult to follow.	Procedures do not accurately list the steps of the Rube Goldberg Machine.

Rube Goldberg Challenge: Machine Rubric

CATEGORY	10	8	6	4
Task Completed	Rube Goldberg machine successfully completes one of the five tasks.	Rube Goldberg machine almost completes all of one of the five tasks.	Rube Goldberg machine completes most of one of the five tasks.	Rube Goldberg machine was not successful in completing one of the five tasks.
Time	Rube Goldberg machine completes task in two minutes or less.	Rube Goldberg machine completes task between two minutes and two minutes and thirty seconds.	Rube Goldberg machine completes task between two minutes and thirty seconds and three minutes.	Rube Goldberg machine requires more than three minutes completing task.
Steps	Rube Goldberg machine has at least 20 working steps.	Rube Goldberg machine has at least 16 working steps.	Rube Goldberg machine has at least 11 working steps.	Rube Goldberg machine has at least 6 working steps.

Subtotal Rube Goldberg Paper: _____/50

Subtotal Rube Goldberg Machine: _____/50

Total Score: Rube Goldberg Challenge: _____/100