

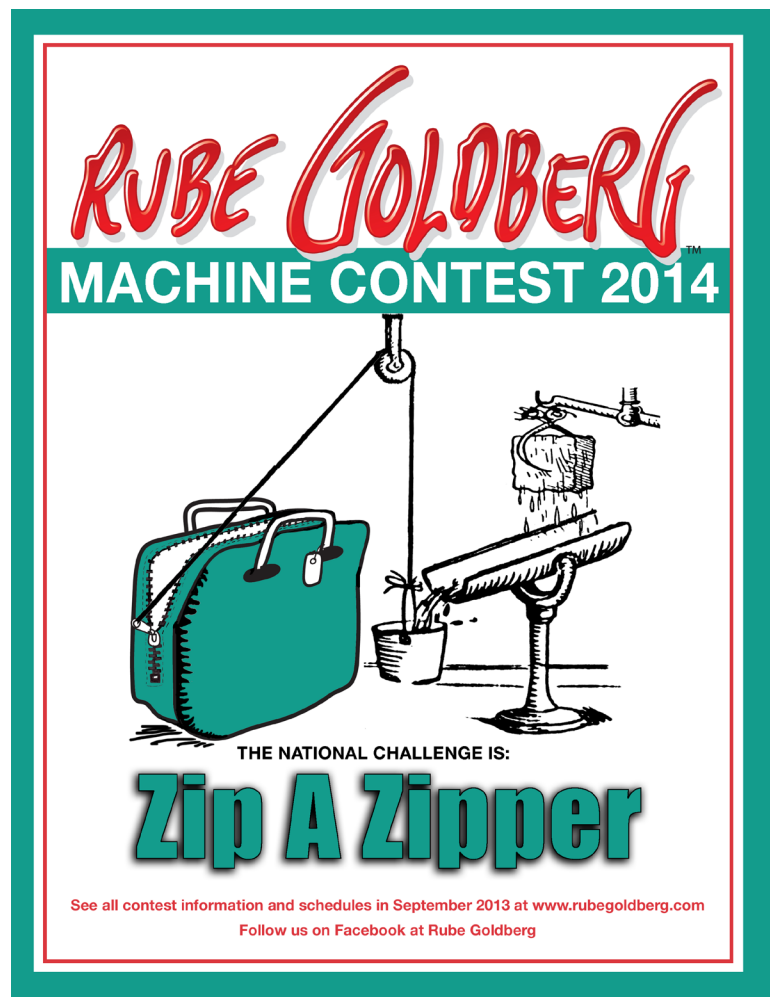
**2014 OFFICIAL RULE BOOK**  
**College and High School Level**

Rule Book changes and/or additions are noted in this color

# **RUBE GOLDBERG**

## **MACHINE CONTEST®**

### **2014 Task: Zip A Zipper**



# RUBE GOLDBERG

## MACHINE CONTEST®

### MISSION

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Our goal, with all levels of competition of the RUBE GOLDBERG MACHINE CONTESTS, is to encourage critical thinking and problem solving in a non-traditional learning environment. And to have fun in the process.

Students from middle school through college, can compete in a RGM. Our contests are STEM and STEAM friendly. Students who participate in our contests not only employ physics and engineering, but humor and story-telling, to create their RGM's.

Rube Goldberg (1884-1970) was a Pulitzer Prize winning cartoonist, who is best known for his wacky inventions. His cartoons appeared daily for approximately 50 years and his popularity made him a cultural touchstone.

"Rube Goldberg" is an adjective, invoked daily – in the news, in print, on the web – to describe an overly complicated effort to accomplish a singular goal. Recent examples include: the mission to Mars, cleaning up the BP oil spill in the Gulf, and the election process.

Rube's influence on some of the great creative minds of the last century, especially in film, is significant. Both Steven Spielberg and Tim Burton have been inspired by his work and employ Rube Goldberg sequences in many of their films.

"The Reuben" – cartooning's highest award, presented annually, is named after Rube Goldberg.

A Rube Goldberg machine is an overly complex contraption, designed to accomplish a simple task. However, the best RGM's emulate their namesake – using a variety of every-day items in a whimsical way to create a series of chain-reaction steps to accomplish the simple task set forth for the annual competition. Most importantly, the best RGM's make us laugh. (Note: if you're not familiar with Rube Goldberg's work, go to the "Gallery" and read on!)

# RUBE GOLDBERG

## MACHINE CONTEST®

### PAST CONTEST TASKS

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2013	Hammer A Nail
2012	Inflate A Balloon and Pop It!
2011	Watering A Plant
2010	Dispense an Appropriate Amount of Hand Sanitizer into a Hand
2009	Replace an Incandescent Light Bulb with a More Energy Efficient Light Emitting Design
2008	Assemble a Hamburger
2007	Squeeze the Juice from an Orange
2006	Shred 5 Sheets of Paper
2005	Change Batteries and Turn on a 2-battery Flashlight
2004	Select, Mark and Cast an Election Ballot
2003	Select, Crush and Recycle and Empty Soft Drink Can
2002	Select, Raise and Wave a U.S. Flag
2001	Select, Clean and Peel an Apple
2000	Fill and Seal a Time Capsule with 20th Century Inventions
1999	Set a Golf Tee and Tee Up a Golf Ball
1998	Shut Off An Alarm Clock
1997	Insert and Then Play a CD Disc
1996	Put Coins in a Bank
1995	Turn on a Radio
1994	Make Cup of Coffee
1993	Screw a Light Bulb into a Socket
1992	Unlock a Combination Padlock
1991	Toast a Slice of Bread
1990	Put the Lid on a Ball Jar
1989	Sharpen a Pencil
1988	Adhere a Stamp to a Letter
1987	Put Toothpaste on a Toothbrush

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Rube Goldberg (rōōb göld'berg), n. a comically involved, complicated invention, laboriously contrived to perform a simple operation — *Webster's New World Dictionary*

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# RUBE GOLDBERG

## MACHINE CONTEST®

### TO PARTICIPATE IN THE RUBE GOLDBERG MACHINE CONTEST (RGMC)

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1. **Form a team** of at least 3 people
2. **Register** for a Local/Regional contest near you at <http://www.rubegoldberg.com>
  - Click on "Find a Contest"
  - Click on "Register" and complete the online registration form
  - Pay the \$150 registration fee
  - Some Host sites may charge additional fees payable directly to them.
  - Find that information in the Contest Schedule
  - on <http://www.rubegoldberg.com>

***No Local/Regional contest near you? Host one!***

*For more information go to <http://www.rubegoldberg.com>*

*Click "Host a Contest"*

*(Or contact [rube@rubegoldberg.com](mailto:rube@rubegoldberg.com) to request admission directly to a National contest at the discretion of Rube Goldberg, Inc.)*

3. **Design and build a machine**

2014 Task - **ZIP A ZIPPER**

Steps, pieces and components from previous machines may be recycled, but RGI relies on the ingenuity of students and teachers to create entirely new machines for each year's competition.

4. **Compete** in a Local/Regional contest
5. **Win** your Local/Regional contest to qualify for a National Contest
6. **Have fun!**

# RUBE GOLDBERG

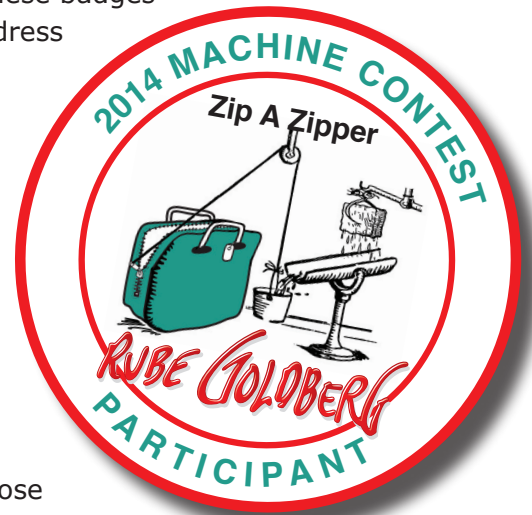
## MACHINE CONTEST®

### 1. FORM A TEAM

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#### **All Teams**

- Must have a minimum of 3 eligible members (see eligibility, below)
- Will receive a 3" embroidered contest participant badge displaying the year and the task for each registered team member (up to 12). These badges will be mailed to the team Advisor/Captain at the address provided during the registration process. Additional badges are available for \$5 each by emailing [rube@rubegoldberg.com](mailto:rube@rubegoldberg.com). Please include the name of your school, your mailing address and the name of the host site where you are competing.



#### **College Team Eligibility**

- Each team must have a team Captain who will be present at the contest.
- (optional) Each team may have a faculty Advisor, whose attendance at the contest is optional.
- All team members must be enrolled as full-time undergraduate or graduate students at an accredited university in order to participate in the contest.

#### **High School Team Eligibility**

- Each team must have a teacher or parental Advisor who will be present at the contest.
- All team members must be enrolled as full-time high school students in order to participate in the contest.

# RUBE GOLDBERG

## MACHINE CONTEST®

### 2. REGISTER

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- Local/Regional contest registration will open in Fall 2014.  
All contest registrations must be completed through <http://www.rubegoldberg.com>.
- Entries are accepted on a first-come, first-served basis by the deadlines set by each Contest Chairman. The Contest Chairman will determine the number of teams.
- Each team and their machine may compete at only one Host site contest.  
If schools have several teams and machines, they may register unique teams and machines to compete at more than one Host site, but the same team and machine may not be registered for more than one contest.
- The \$150 registration fee is payable to RGI. Some Host sites may charge additional fees payable directly to them.  
Find that information in the Contest Schedule on <http://www.rubegoldberg.com>
- Entry fees are non-refundable.

# RUBE GOLDBERG

## MACHINE CONTEST®

### 3. DESIGN AND BUILD A MACHINE

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#### 2014 Task

The 2014 Task is **ZIP A ZIPPER**. The task each year is determined by Rube Goldberg, Inc. and changes on an annual basis. The 2015 task will be posted at <http://www.rubegoldberg.com> the day after the 2013 College Nationals complete.

#### Machine Specifications

Machine Specification	Value
Complete official challenge	Required
Minimum number of steps	20
Maximum number of steps	Unlimited
Physical size	Maximum 6 feet x 6 feet x 6 feet
Single run time	Maximum 2 minutes
Air compressor hoses running to the machine	Maximum 1 hose
AC or DC power cords running to the machine	Maximum 1 cord
Air compressor hoses and power cords used within the machine boundaries	Unlimited
Hazardous materials, explosives, or flames	Not allowed
Electrical arcing	Allowed with safety approval of Contest Site Chairman
Use of live animals	Not allowed
Corporate logos	Allowed, with written permission from the logo owner. All responsibility for copyright permission rests with the team.
Use of profane, indecent, or lewd expressions	Not allowed
Objects flying beyond machine boundaries	-5 points per object. Includes drops of water, slivers of balloon, and other "small" objects. Steam and other gases are exempt from this rule.
Safe for participants and observers	Required. Questionable items must be approved by the Contest Site Chairman prior to the contest.

# RUBE GOLDBERG

## MACHINE CONTEST®

### 3. DESIGN AND BUILD A MACHINE *continued*

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#### Frequently Asked Questions

*Question:* 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 succession should be counted as 1 step.

*Example:* A sequence of dominos hitting each other should be counted as 1 step. Counting 100 dominoes as 100 steps is repetitive and not in the spirit of Rube Goldberg.

*Question:* Can programmable logic controllers or microcontrollers be used?

*Answer:* Yes, but their use must fit within the definition of a step. Steps that use controllers should be clearly stated in the written step list and include detailed information on how the transfer of energy is accomplished. Using controllers as a fail-safe is illegal and will result in disqualification.

*Example:* A ball falls onto a switch connected to a controller that turns on a motor.

**NO:** If the ball misses the switch but the controller still starts the motor, the controller is not transferring energy from one action to another action. It is acting as a fail-safe instead of a step and is illegal.

**YES:** If the ball hits the switch and the controller starts the motor, the controller is transferring energy from one action to another action and is consistent with the definition of a step.

*Question:* Where can I find answers to other frequently asked questions?

*Answer:* Visit <http://www.rubegoldberg.com/contest/faq>



# RUBE GOLDBERG

## MACHINE CONTEST®

### 4. COMPETE

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#### Prior to the Contest

Time to Contest	Event
2 hours before	Contest Host Site will provide participants adequate setup time in the contest venue
1 hour before	Submit 10 (or other number specified by your Contest Host Site) concise, typed copies of a step-by-step description of their machine Contest Host Site Chairperson. Diagrams and pictures may be included in this description along with typed information.
40 minutes before	All machines must be set up and area surrounding them cleared
30 minutes before	Team captains' meeting

#### During the Contest

Specification	Value
Verbal presentation length	Maximum 2 minutes
Team members around machine	Minimum 4 team members Maximum as defined by the Contest Site Chairman
Team member contact with machine	Maximum 2 team members touching the machine at a time (including during resetting the machine)
Reset time	Minimum 20 minutes between runs
Destructive action against other machines	Contest disqualification

Teams will compete in a designated order. The teams will compete in that order for the first run. After all teams have completed their first run, teams will begin competing in the second run in this same order.

If, for any reason, a team so chooses, they may void one (1) run of their machine. One designated team member will announce the void, but must do so BEFORE the machine completes the task. Requests presented after the machine has finished will not be granted. If a team does choose to use their void, they will compete again in the next round of runs.

Teams may only void their first or second run before the task is complete. Teams may not void a run after the machine has completed the task. If a team does not void either of their first two runs, they may choose to do a third run, but that run will not be judged.

# RUBE GOLDBERG

## MACHINE CONTEST®

### **4. COMPETE** *continued*

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While the judges are calculating the results, and the audience's ballots are counted for the optional People's Choice Award, the audience will be allowed to view the machines more closely. Teams are encouraged to run their machines and be available to answer any questions during this time.

#### **After the Contest**

Machines must be removed and the area cleaned by a time determined by the Host Contest Site Chairperson.

Contest participation implies consent to use contest photographs in all forms of publicity.

For site-specific rules and processes, contact your Contest Host Site Chairman.

# RUBE GOLDBERG

## MACHINE CONTEST®

### 5. WIN

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The First place team from each Local/Regional contest, may compete in the National Contest. There is no additional fee to RGI to compete in the National Contest.

If the First place team is unable to attend Nationals, the 2nd place winner of that regional competition may attend in their place. In addition, if the 2nd place winner of that regional is unable to attend Nationals, then the 3rd place winner may attend in their place.

Immediately after the Local/Regional contest, each First place team must inform RGI if they plan to attend Nationals. Email us at [rube@rubegoldberg.com](mailto:rube@rubegoldberg.com).

### 6. HAVE FUN



## MACHINE CONTEST®

### JUDGING INSTRUCTIONS - 2014 COLLEGE AND HIGH SCHOOL

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#### ■ GENERAL IMPRESSIONS (45 POINTS)

##### *Step List (0 to 5 points)*

How clear, concise, and creative is the written explanation of the machine?

##### *Theme or Story (0 to 10 points)*

How well is a recognizable theme or story integrated into the machine?

##### *Laugh Barometer (0 to 10 points)*

Similar to Rube Goldberg's cartoons, how funny is the machine?

##### *Complexity (0 to 10 points)*

How well does the machine complete the task in a manner more complex than necessary?

##### *Team Chemistry (0 to 5 points)*

How well does the team communicate and work together?

##### *Everyday Items (0 to 5 points)*

How well does the machine use recognizable everyday items in a creative, unique, funny way?

#### ■ RUN RELATED (55 POINTS)

##### *Verbal Presentation (0 to 5 points)*

How clear, concise, creative, and charismatic is the verbal presentation of the machine?

Time (up to 2 minutes: no penalty; 2:00 – 2:15 minutes: -5 points; over 2:15 minutes: -10 points)

##### *Rube Goldberg Style Steps (0 to 10 points)*

How well are steps designed to use everyday items in creative, unique, and unusual ways?

How much variety in mechanisms, energy forms, materials, and physical principles exists in the steps?

##### *Machine Flow (0 to 10 points)*

How easy is it to see and follow the sequence from the first through the last step?

Teams may only void their first or second run before the task is complete. Teams may not void a run after the machine has completed the task. If a team does not void either of their first two runs, they may choose to do a third run, but that run will not be judged. A void must be communicated by one designated team member before the task is complete.

# JUDGING FORM - 2014 RUBE GOLDBERG MACHINE CONTEST FOR COLLEGE AND HIGH SCHOOL

Scoring and Detail				
<b>TEAM NAMES</b>				
Step List (0-5)				
Theme/Story (0-10)				
Laugh Barometer (0-10)				
Complexity (0-10)				
Team Chemistry (0-10)				
Everyday Items (0-5)				
Verbal Presentation (0-5) Time: (up to 2 minutes: no penalty; 2:00 - 2:15 minutes: -5 points; over 2:15 minutes: -10 points)				
Rube Goldberg Style Steps (0-10)				
Machine Flow (0-10)				
Sub Total				
<b>RUN 1</b> Task Completed (0-15)				
Time: (up to 2 minutes: no penalty; 2:00 - 2:15 minutes: -5 points; 2:15 - 2:30 minutes: -10 points over 2:30: -15)				
Human Interventions (-5 points each)				
Objects Leaving Machine (-5 points each)				
Sub Total Run 1				
<b>RUN 2</b> Task Completed (0-15)				
Time: (up to 2 minutes: no penalty; 2:00 - 2:15 minutes: -5 points; 2:15 - 2:30 minutes: -10 points over 2:30: -15)				
Human Interventions (-5 points each)				
Objects Leaving Machine (-5 points each)				
Sub Total Run 2				
<b>RUN 3</b> Task Completed (0-15)				
Time: (up to 2 minutes: no penalty; 2:00 - 2:15 minutes: -5 points; 2:15 - 2:30 minutes: -10 points over 2:30: -15)				
Human Interventions (-5 points each)				
Objects Leaving Machine (-5 points each)				
Sub Total Run 3				
<b>TOTAL - (Only 2 runs maybe counted. Please X out the voided Run.)</b>				

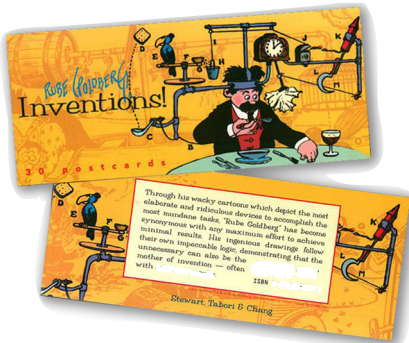
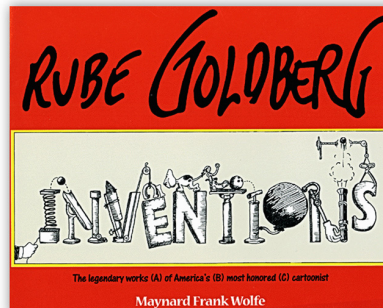
# RUBE GOLDBERG

## MACHINE CONTEST®

### RUBE STORE AND zazzle.com

Rube Goldberg products are available in the Rube Store on our web site: [rubegoldberg.com/?page=store](http://rubegoldberg.com/?page=store). RGI gives a 30% discount, off the Suggested Retail price, to any host site using the items as awards.

Check out the wide selection of Rube Goldberg products on [zazzle.com/rubegoldberg](http://zazzle.com/rubegoldberg), where you can create your own team T-shirt, sweatshirt or cap, and put your school logo or team name!



# RUBE GOLDBERG

## MACHINE CONTEST®

### CONTEST CONTACT INFORMATION

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Education Outreach Director: Shawn Jordan, Ph.D

*"To invent, you need a good imagination and a pile of junk."*  
– Thomas Edison