WELCOME TO THE 2017 RUBE GOLDBERG MACHINE CONTEST!

This year’s task:
APPLY A BAND-AID®

What do you need to compete?
A GOOD IMAGINATION and A PILE OF JUNK.

The Rule Book ABBREVIATED VERSION follows.

Register your team to get the complete version of the Rule Book, via a link on your Welcome email.
Rube Goldberg (1884-1970) was a Pulitzer Prize winning cartoonist, best known for his nutty chain reaction inventions. The popularity of these cartoons made him a cultural touchstone, an adjective in Merriam-Webster’s Dictionary, and a term that today is invoked daily in American media.

If you’re not familiar with Rube Goldberg’s work, go to the “Gallery” section of rubegoldberg.com.

See Rube’s biography at rubegoldberg.com/about.
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Rube Goldberg, Inc is a 501(c)3 not-for-profit organization dedicated to promoting STEM and STEAM education for students of all ages. Registration fees are not tax deductible, however, contributions are tax deductible to the full extent permitted by law.

Rube Goldberg Machine Contest®, Rube Goldberg Machine™ and the Rube Goldberg Challenge® are all trademarks of RGI.
WHAT IS A RUBE GOLDBERG MACHINE?

A Rube Goldberg Machine (RGM) is a crazy contraption which accomplishes a simple task in the most complicated – and funniest - way possible! Based on the “Invention” cartoons of the famous Pulitzer Prize-winning American cartoonist, Rube Goldberg, actual machines are at the heart of the Rube Goldberg Machine Contest. They use everyday items (mostly junk!), they tell a story and, most important of all – they make you LAUGH.

But millions of tinkerers, makers, inventors, “mad” scientists, and DIY’ers make Rube Goldberg Machines all the time. They can’t help it! While they’re having fun creating kooky solutions to simple, everyday tasks they also happen to be incorporating elements of Science, Technology, Engineering and Math (with Art and design thrown into the mix!). People who make Rube Goldberg Machines – whether for fun or to solve an actual task – are innately curious problem-solvers who often say, “I can fix that!”

The word “rube” has been now redefined as someone who loves to make Rube Goldberg Machines. Are you a “Rube”?

For more inspiration, go to rubegoldberg.com/gallery/ and look through the Gallery.
For more info, see the Tips on page 11.
WHAT IS A RUBE GOLDBERG MACHINE CONTEST?

A Rube Goldberg Machine Contest (RGMC) is an event where students of all ages compete with the machines they have imagined, designed and created in a fun and competitive forum. The competitions encourage teamwork and out-of-the-box problem solving, in a fresh learning environment and level playing field. Remember, to compete in a RGMC all you need is a good imagination and a pile of junk!

CONTEST OPPORTUNITIES

There are 2 types of contests:

- Live
- Online

Any team, no matter what their location, may compete in either the Live or the Online contest. **Teams may not compete in both.**

- A team may compete in only one Contest.
- A school/organization may register multiple teams, in multiple contests, each with a unique machine.

COST AND REGISTRATION

There are costs involved with forming a Rube Goldberg team.

- Registration fee for ALL CONTESTS is $395.00 per team payable directly to RGI. **($50 off, for team registrations received by January 1st, 2017!)**
- There is a Finals fee of $395.00 to RGI for all Live teams attending Finals.
- Teams are encouraged to seek out local sponsors. In addition to registration fees, costs may include transportation of the machine and the team, food and overnight accommodations.

TEAM GIFTS

Once the Team Leader has registered, approved all members of the team that have electronically filed their Consent and Release agreement and paid, Team Gifts will be mailed to the Team Leader at the address provided during the registration process.

1. 2017 RGMC enamel pin, displaying the task and the RGI STEM logo.
   One pin for each member of the team and the Team Leader.
2. 2017 Rube Goldberg School Year Calendar Poster.
   One Calendar Poster for each team member.
3. A coupon for 1 desktop download of RubeWorks.
   One desktop download for each team member.
4. One 2017 official Rube Goldberg INVENTIONS calendar for the classroom while they last.
5. BAND-AID®s. Actual BAND-AID®s or redeemable coupons from this year’s sponsor, Band-Aid Brand Adhesive Bandages. (NOTE: you are not required to use a specific brand in your machine).
# CONTEST PRIZES

## LIVE CONTESTS

### Regionals, all Divisions:
- Trophies for:
  - 1st, 2nd and 3rd place
  - Rube Goldberg Creative Spark Award
  - Spirit of Rube Goldberg Award
  - Rube Goldberg Teamwork Award

### Finals:

#### Division I, II and III – 1st place teams
- A trophy
- $1000 award

#### Division I, II and III – 2nd place teams
- A trophy
- $750 award

#### Division I, II and III – 3rd place teams
- A trophy
- $500 award

## ONLINE CONTESTS

### Finals:

#### Division I, II and III – 1st place teams
- A Team personalized trophy
- $500 award
- Free registration in our 2018 Contest

#### Division I, II and III – 2nd place teams
- A Team personalized trophy
- $250 award
- Half price registration in our 2018 Contest

#### Division I, II and III – 3rd place teams
- A Team personalized trophy
- “The Art of Rube Goldberg” — the most comprehensive coffee table book on the Pulitzer Prize winning cartoonist’s 70 year career. Signed by Jennifer George
- Half price registration in our 2018 Contest

### All People’s Choice winners
- A Team personalized People’s Choice trophy
## Live Contests

**Division I** - Sunday, March 26  
**Division II** - Saturday, March 25  
**Division III** - Sunday, March 26  

All Division Finals will be held at COSI, Columbus, OH on the weekend of March 24-26.

Check our website often for new and updated info for Finals.

### Online Contests

**Division I**  
- March 31, 2017 11:59 PM EST  
  Registration closes.

**Division II**  
- April 5, 2017 11:59 PM EST  
  Team Pages close for editing.

**Division III**  
- April 6, 2017 11:59 PM EST  
  People’s Choice voting starts.

- April 14, 2017  
  Round 1 results announced.

- April 21, 2017  
  Round 2 results announced.

- April 30, 2017 11:59 PM EST  
  People’s Choice voting closes.

- May 1, 2017  
  Online FINALS results announced.

- People’s Choice results announced.
LET’S GET STARTED!

1. Team Rules

2. Register a Team
   Entry fees are non-refundable.

3. Design and Build a Machine
   2017 Task - Apply a BAND-AID® Brand Adhesive Bandage
   (but you are NOT required to use a specific brand in your machine).
   RGI requires that machines in this year’s competition use purchased adhesive bandages.
   Band aids come in many, many shapes, sizes, colors and finishes (fabric, plastic, flexible). We always encourage creativity. Focus that creativity on the mechanics and presentation of your machine, not on the “creation” of a Band-Aid.

   Create a Team Page

4. Compete in the Live Contest

5. Compete in the Online Contest

6. Win Live.
   Win Online.
   Win People’s Choice.

No matter how thin you slice it, it’s still baloney
1. TEAM RULES

All Teams...

- must have a Team Leader 18 years of age or older.
- Division I and II must have a non-student Team Leader.
- must be comprised of at least 3 eligible members.
- max team size is 10 students.
  Only 10 students may work on the machine or attend the contest and interact with the machine. Other students may come along and watch.

Once the Team Leader has registered, approved all members of the team that have electronically filed their Consent and Release agreement and paid, Team Gifts (page 5) will be mailed to the Team Leader at the address provided during the registration process.

DIVISION I: Ages 11 – 14 Team Eligibility

- Each team must have a Team Leader who will be present at the Contest.

  NOTE: All team members must be students between the ages of 11 and 14.

DIVISION II: Ages 14 – 18 Team Eligibility

- Each team must have a Team Leader who will be present at the Contest.

  NOTE: All team members must be students between the ages of 14 and 18.

DIVISION III: Ages 18+ Team Eligibility

- Each team must have a Team Leader who will be present at the Contest.

  NOTE: All team members must be students 18 years of age or older and enrolled as undergraduate or graduate students at an accredited university.

THIS IS A STUDENT COMPETITION

- Only students may build the machine.
- Only students may set up the machine.
- Only students may touch the machine (e.g., do interventions, fix the machine, etc.) during the competition.
- People who are not on the team may help transport the machine.

Safety is always the first priority. For scenarios that require building and lifting large pieces of a machine into place, or using tools that require adult assistance, adult help is acceptable.
2. REGISTER A TEAM

- All contest information and material will be sent to the Team Leader’s email and/or address on the registration form.
- Go to rubegoldberg.com
- Click on CONTESTS
- Click on Register
- Choose Live Contests or Online Contests
  - Any team, no matter what their location, may compete in either the Live or the Online contest. **Teams may not compete in both. Choose one.**
  - A school/organization may register multiple teams, in multiple contests, each with a unique machine
- If you choose Live Contests, choose a Host location
- Create an account
- Follow the prompts, fill out the form and pay the fee
  - We prefer payment via Paypal
  - New procedure for Purchase Orders. **PO’s must be paid 4 weeks prior to Contest date, or Teams will not be allowed to participate.**

### INVITE TEAM MEMBERS

**Team Leaders must INVITE and APPROVE Team Members.**

**Click on the green button on your Team Page.**

The green button is not activated until payment is made via PAYPAL or a PO# is entered on the Invoice request form.

- Click Invite Team Members button and follow the prompts.
- Team Members (or their parents if they are minors) must go in and complete the form and read and accept the parental Release and Consent (see sample on next page) before you can accept them on your team.
- On your Team Page, click “Invite and Approve Team Members” to see and approve your invitees.
- Team participants must be accepted a minimum of 3 weeks before the contest date.

Team Leader registration opens on rubegoldberg.com October 12, 2016.
TODAY's DATE:

Participant Name*: ______________________________________________________________________________________
Participant Date of Birth, if under 18 years of age (MM/DD/YY)*: ____________________________
Participant Age, in years, as of this date*: ____________________________________________
Participant Address*: ________________________________________________________________________________________
Participant Cellphone Number*: _______________________________    Phone Number: ______________________________
Participant Team Name/Number*: ____________________________________________
If Participant is under 18 years of age, as of submission date above:
Parent/ Guardian Name(s)*: ________________________________________________________________________
Relationship to Participant*: __________________________________________________________________________
Parent / Guardian E-Mail*: _________________________________________________________________________
Address*: ______________________________________________________________________________________________
Cell phone number*: _________________________________
Tel. Number*:_______________________________________
(*) - Denotes required field.

The participant identified above desires to participate (as a team member, coach, mentor, judge, or in some manner) in a Rube Goldberg Machine Contest (or other RGI sponsored program). As a condition of participation, Rube Goldberg, Inc. (RGI) requires that the Participant (and his or her Parent/Guardian if participant is under 18 years of age) agree to the terms of this Consent and Release agreement.

1) Participant ( and the Parent/Guardian if under 18 years of age) understands that participation in the contest may expose Participant to risk of bodily injury including, without limitation, injury from: building, lifting and using electrical or mechanical parts and components; using tools; other participants; dancing and other associated activities. Participant understands that RGI does not select, employ, supervise or otherwise exercise authority or control over coaches, mentors and other participants in the contest. Participant, if 18 years or older, acknowledges and agrees that he/she is primarily responsible for his/her safety. The Parent/Guardian of a Participant under 18 years of age acknowledges and agrees that the Parent/Guardian is primarily responsible for the Participant's safety and that the Parent/Guardian will monitor, as appropriate considering the age of the Participant and other factor's, participation in the contest.

2) In consideration for RGI allowing the participant to participate in the contest, Participant (and the Parent/Guardian if participant is under 18 years of age and on behalf of the participant and the Parent/Guardian) assumes all risk of such participation and hereby releases RGI and its 2017 sponsor, Johnson & Jonson Consumer Inc., and all RGI and Johnson & Johnson Consumer Inc. affiliates, directors, officers, employees, volunteers and agents from any and all claims for an injury of any kind to the participant (and the Parent/Guardian) or other damages that may occur as a result of the Participant's participation in the contest, including without limitation any injuries or other damages that may be caused by the negligence of RGI and/or Johnson & Johnson Consumer Inc. or negligence of any RGI and/or Johnson & Johnson Consumer Inc. affiliate, director, officer, employee, volunteer, or agent (including, without limitation, negligently failing to adequately investigate or screen coaches, mentors, volunteers, etc.) and agrees not to file any lawsuit or otherwise make any claim against RGI or Johnson & Johnson Consumer Inc. or any RGI and/or Johnson & Johnson Consumer Inc. affiliate, director, officer, employee, volunteer, or agent for such injury or other damages. The Participant (and the Parent/Guardian of a participant under 18 years of age) does not hereby release any claims against any individual person who intentionally causes injury to the Participant.

3) Participant (and the Parent/Guardian of a participant under 18 years of age) understands that photographs, videos, and other recordings will be made of the participants in the contest, including the participant. Participant (and the Parent/Guardian of a participant under 18 years of age) consents to those photographs, videos, and other recordings and the use of thereof as part of the contest and to promote RGI and the machine contest.

Participant and the Parent/Guardian of a participant under 18 years of age has read this document and understands that this consent and Release agreement includes a waiver of the right to make injury claims and is intended to be legally binding. By signing below, Participant (and the Parent/Guardian of a participant under 18 years of age) agrees to this Consent and Release Agreement.

Signature (of Participant if 18 years of age and older or Parent/Guardian if under 18)

(Printed Name of person)                                                                                                       (Date)
TIPS

Machine Introduction and Walk-Through: This is your team’s chance to shine and be creative! We want to hear the story your machine tells, and understand how the steps represent the theme and key elements of the story. The Machine Introduction should not be a step-by-step explanation of how the steps work, but rather a story that references the most unique and important steps of your machine.

Materials: RGMs should be “green” machines, made of recycled items, wherever possible. Everyday, household objects are best and you can use just about anything! Not just toys, but a lamp, chair, fork, your grandpa’s suspenders – you name it! Try using items differently than for their original purposes – an overturned bike’s wheels can generate momentum, or a chair on top of a table can give you the power of gravity. Creativity is key - look in the basement, garage or junk drawer, rummage around for old keys, check out a yard sale for weird stuff no one else wants!

Dominoes and marble runs: Rube Goldberg never used dominoes in any of his machines! Marble runs and falling dominos are fun to look at – but they’re not very creative. We encourage you to be resourceful and find alternatives in creating your machine’s energy transfers.

IMPORTANT: Identical transfers of energy in succession will be counted as 1 step. For example, a thousand dominos falling onto each other will be counted as one step.

Humor: Rube Goldberg was a cartoonist – he was very funny! RGMs should work but they also need to capture attention. The more theatrical and funny your machine is, the better it will score! The most successful teams have members with diverse skills including; engineers, entertainers, mathematicians, and comedians working together!

Plan enough time to build your machine: Making something look easy is hard – and it takes a lot of time. We recommend at least three months to build, test and ready your machine for competition. Run your machine often-make sure the steps are all working as they should. The most successful machines are not built the week before the competition!

Travel: Travel is tough on machines! Make your machine in small, sturdy sections which can be transported easily and safely – and quickly and simply set up. Duct tape and cardboard machines usually fall apart on their way to competitions. Bring extra materials to the competition, just in case! Double-check the dimensions of doorways, elevators, hallways and stairwells at the competition site – and whatever vehicle you’re using for transport - and make sure your machine fits!

If you are stuck, check out the many videos and pictures on our website at rubegoldberg.com/contest/
FREQUENTLY ASKED QUESTIONS

Q: What kind of adhesive bandage should we use?

A: You can use any type or brand of adhesive bandage in the task. This year’s task is sponsored by BAND-AID® Brand Adhesive Bandage, but you are NOT required to use a specific brand in your machine.

Q: What is a step?

A: A step in the machine is a transfer of energy from one action to another action. Identical transfers of energy in succession will be counted as 1 step.

Example: A sequence of dominos hitting each other will be counted as 1 step.

Q: What is a touch/human intervention?

A: Any physical touching or action to continue the operation of the machine after the machine begins a Contest run. Multiple touches/human interventions on the same step in the same Contest run count as a single touch.

Example: Your machine stops because one step does not trigger another. A team member interacts with the machine through a physical touch or other device to trigger any steps that follow.

Q: What is reliability?

A: Reliability is how well a machine runs in a single run. For example, a single machine run with no interventions is scored higher than a single machine run with 2 interventions.

Q: What is repeatability?

A: Repeatability is how consistently a machine runs across multiple runs. A machine that works perfectly every time is ideal, but a machine that fails in the same place each time it runs is much easier to debug than a machine that fails in different places every time.
Q: Can programmable logic controllers or microcontrollers be used?
A: 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.

Q: Does completing the task have to be the absolute last step?
A: Any steps that occur after the task has been completed do not count. However, you are free to have steps after the task is completed, even though they do not count toward your total number of steps.

Q: Can I enter a machine that has been previously built and posted online?
A: No. All entries must be new machines built for entry into the current Contest.

Q: Would an inadvertent piece of popped balloon or silly string leaving the machine boundaries affect our team’s score?
A: All objects must be contained within the calculated machine volume. This includes anything that is considered inadvertent. Safety is key to our spectators, Contest Officials, and all team members. If your team has identified a flying object within the machine, your team must contain the object. All objects, including inadvertent objects, that leave the machine boundary will result in a penalty.

Q: See FAQ’s on our site.
A: Visit rubegoldberg.com/contests/faqs/
3. DESIGN AND BUILD A MACHINE

2017 Task
The task changes on an annual basis and is determined by Rube Goldberg, Inc. The 2017 Task is **Apply a BAND-AID® Brand Adhesive Bandage** (but you are NOT required to use a specific brand in your machine).

**NOTE:** Steps, pieces and components from previous machines may be recycled, but the RGMC relies on the ingenuity of students and teachers to create entirely new machines for each year’s contest.

**THIS IS A STUDENT COMPETITION**
- Only students may build the machine.
- Only students may set up the machine.
- Only students may touch the machine (e.g., do interventions, fix the machine, etc.) during the competition.
- People who are not on the team may help transport the machine.

### Machine Specifications & Rules

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete official task</td>
<td>Required</td>
<td>Required</td>
</tr>
<tr>
<td>Steps</td>
<td>10 steps (DIVISION I), 20 steps (DIVISIONS II and III)</td>
<td>75 steps</td>
</tr>
<tr>
<td>Machine volume (Footprint Area x Height of highest point on the machine)</td>
<td>None</td>
<td>300 ft^3 (8.5 m^3)</td>
</tr>
<tr>
<td>Maximum machine dimensions</td>
<td>None</td>
<td>L 10’ W 10’ H 8’</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3m x 3m x 2.4m</td>
</tr>
<tr>
<td>Machine introduction and walk-through</td>
<td>None</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Single run time</td>
<td>None</td>
<td>2 minutes</td>
</tr>
<tr>
<td>Reset time</td>
<td>None</td>
<td>8 minutes</td>
</tr>
<tr>
<td>Machine noise</td>
<td>None</td>
<td>100 dB</td>
</tr>
<tr>
<td>Air compressor hoses, AC or DC power cords, and/or water hoses running to or from the machine</td>
<td>0</td>
<td>2 total</td>
</tr>
<tr>
<td>Hazardous materials, explosives, or flames</td>
<td>Not allowed</td>
<td></td>
</tr>
<tr>
<td>Electrical arcing</td>
<td>Allowed with safety precautions</td>
<td></td>
</tr>
<tr>
<td>Live animals</td>
<td>Not allowed</td>
<td></td>
</tr>
<tr>
<td>Corporate logos</td>
<td>Corporate logos are allowed and may be used within the machine footprint, on team clothing, and on team website pages. All responsibility for logo copyright permission rests with the team.</td>
<td></td>
</tr>
<tr>
<td>Use of profane, indecent, or lewd expressions</td>
<td>Not allowed</td>
<td></td>
</tr>
<tr>
<td>Objects flying beyond machine footprint</td>
<td>Not allowed</td>
<td></td>
</tr>
<tr>
<td>Safe for participants and observers</td>
<td>Required</td>
<td></td>
</tr>
</tbody>
</table>
3. DESIGN AND BUILD A MACHINE (continued)

Calculating Machine Volume - Complete this on your Team Page

ALL TEAMS must design their machine to fit in an overall volume of 300 cubic feet (8.5 cubic meters). The machine volume is defined as the overall footprint (area) of the machine (rounded up to the nearest foot) multiplied by the height of the tallest step.

Teams may build a machine in any shape they wish, so be creative!

How to Calculate the Volume of a Machine

1. Calculate the volume online on your Team Page. You may also draw out your machine footprint on the grid on page 21.

   NOTE: The overall dimensions of your machine may not exceed 10’ length x 10’ width x 8’ height (3 m x 3 m x 2.4 m). If any part of the machine enters any of the 1’ x 1’ (0.3 m x 0.3 m) squares (even if it does not touch the ground/table), the entire square must be counted.

2. Count the number of 1’ x 1’ (0.3 m x 0.3 m) squares into which the machine footprint falls. This is the area of the machine footprint.

   EXAMPLE: area = 44 squares

3. Measure from the lowest to the highest point of your machine; this is the height of your machine.

   NOTE: If the ENTIRE machine sits on a table, the height of the table may be excluded from the height of the machine. If only ONE section of the machine uses a table, then the height of the table must be included in the height of the machine.

   EXAMPLE: The tallest part of the machine is a 5’ tower, so height = 5’

4. Calculate the Machine Volume using the formula: area x height = machine volume

   EXAMPLE: 44 squares (area) x 5’ (height) = 220 ft$^3$

5. Your Machine Volume must be equal to or less than 300 cubic feet (8.5 cubic meters)

   EXAMPLE: 220 ft$^3$ ≤ 300 ft$^3$ (maximum) → Machine Volume is within specifications

CAUTION: Machines that exceed the maximum machine dimensions of 10’ L x 10’ W x 8’ H (3 m L x 3 m W x 2.4 m H) will be disqualified.
3. DESIGN AND BUILD A MACHINE (continued)

Scoring and Judging Process
Teams and machines are now evaluated by two distinct sets of contest officials. Referees and Judges.

REFEREES are contest organizers, contest veterans, teachers, or engineers who fully understand the contest rules.
- Referees use specific criteria to quantitatively evaluate your machine.

JUDGES are industry engineers, sponsors, celebrities/local personalities, and contest veterans who team’s should work to impress based on their Team Spirit, Communication, and their Whimsical Machine.
- The Judges use their personal judgement and point of view to evaluate your team and machine.

6 Awards and percentage that refs and judges contribute to each

1ST PLACE (40% referees and 60% judges)
2ND PLACE (40% referees and 60% judges)
3RD PLACE (40% referees and 60% judges)

RUBE GOLDBERG CREATIVE SPARK AWARD (100% judges)
The most creative machines have a theme that is visible throughout the machine, are easy to follow, are solidly and neatly constructed, and have recognizable common everyday household items that are minimally modified.

SPIRIT OF RUBE GOLDBERG AWARD (100% judges)
Machines that best exhibit the spirit of Rube Goldberg make people laugh! They are whimsical and funny, with an exciting story or theme fully integrated into the machine. Machines that do well in this category do not necessarily have to work, as Rube’s machines never did.

RUBE GOLDBERG TEAMWORK AWARD (100% judges)
Teams that communicate and work together have strong chemistry and a positive attitude throughout the competition, including during machine reset, when fixing machine problems, and when any machine (including those of competitors) runs. They also communicate the story of their machine in a fun, whimsical, and easy to follow way, using drama and costumes in the introduction of their machine. Machine introductions should not be walking the audience through each step of a machine.

For contest scoring and determination of 1st, 2nd, and 3rd place teams, Contest Hosts MUST have access to Microsoft Excel, or an iPad/Laptop that is capable of accessing the Internet and www.RubeGoldberg.com during the contest.
4. COMPETE IN THE LIVE CONTEST

NEW

ALL TEAMS MUST COMPLETE A TEAM PAGE.
Complete your Team Page prior to your competition. No videos or photos are required at that time.

Rube is going digital! Online Teams have had the benefits for years. Now Live teams will have the same. The benefits of creating a Team Page are:
1. see your scoring and judges comments on your Team Page.
2. put your Step List on your Page - no need for paper for refs and judges.
3. put your Machine Volume Worksheet on your Page - no need for paper.
4. your video will be up for the world to see - share your Team Page on your social media.

NEW

DIVISION III ONLY: It is no longer necessary to attend a regional. Teams may register for and compete at a regional, but ALL Division III teams are allowed to register for Finals without first competing at a regional. Regardless, every event a Team attends requires it’s own registration fee.

Prior to the Contest

<table>
<thead>
<tr>
<th>Time to Contest</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 hours prior</td>
<td>Host Site will provide participants adequate setup time in the Contest venue.</td>
</tr>
<tr>
<td>1 hour prior</td>
<td>Submit 10 (or other number specified by your Contest Host Site) concise, typed copies of (1) a step-by-step description of their machine, and (2) a completed machine volume worksheet to their Contest Host Site Chairperson. Diagrams and pictures may be included in this description along with typed information.</td>
</tr>
<tr>
<td>40 minutes prior</td>
<td>All machines must be set up and area surrounding them cleared.</td>
</tr>
<tr>
<td>30 minutes prior</td>
<td>Team Captains’ meeting</td>
</tr>
</tbody>
</table>

During the Contest

- Teams will be broken into “pods” of not more than 9 teams. Each pod will be evaluated by a group of at least (2) referees and at least three (3) judges.
- Each pod will operate in parallel to other pods for larger competitions containing two or more pods. This means that one team in each pod might run their machine at identical times.
- Teams will be assigned a time to compete. This is their time to shine for the referees who will be scoring both the team & machine.
- Prior to the teams’ scheduled time slot, teams are encouraged to continuously run their machines for the audience members and Judges. Judges will stop by at unassigned times to judge a team’s machine.

(continued on next page)
4. COMPETE IN THE LIVE CONTEST (continued)

Teams and machines are now evaluated by two distinct sets of contest officials. Referees and Judges.

**REFEREES** are contest organizers, contest veterans, teachers, or engineers who fully understand the contest rules.

*What they do:* Referees use specific criteria to quantitatively evaluate your machine. Referees will score your machine at specified assigned times. At this assigned time, the team will introduce their machine, complete run #1, reset, and then complete run #2. The referees will evaluate the team & machine on the items found on the sample Referee Form on page 22.

**JUDGES** are industry engineers, sponsors, celebrities/local personalities, and contest veterans who team’s should work to impress based on their Team Spirit, Communication, and their Whimsical Machine.

*What they do:* Judges will walk the floor and pods freely while teams run their machine continuously for the audience and referees. The team’s job is to demonstrate to the Judges the items found on the judging form. The Judges use their personal judgement and point of view to evaluate your team and machine in the three judging categories. These categories and their explanations can be found on the Judging Form, page 24.

<table>
<thead>
<tr>
<th>Specification</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine introduction and walk-through</td>
<td>None</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Team members participating during refereed and judged machine operations</td>
<td>None</td>
<td>4</td>
</tr>
<tr>
<td>Team members in contact with machine during a Contest Run</td>
<td>None</td>
<td>2 simultaneously</td>
</tr>
<tr>
<td>Reset time limit</td>
<td>None</td>
<td>8 minutes</td>
</tr>
<tr>
<td>Destructive action against other machines</td>
<td>Contest disqualification</td>
<td></td>
</tr>
</tbody>
</table>

**After the Contest**

- Machines must be removed and the area cleaned by a time determined by the Host Site Chairperson.
- Contest participation implies consent to use Contest photographs in all forms of publicity.
- For site-specific rules and processes, contact your Host Site Chairperson.
HELPFUL HINTS ON HOW TO WIN BIG AT RUBE GOLDBERG MACHINE CONTESTS!

1. Build in a recognizable theme to your machine.
2. Strive to create an image for your team based on the theme of your machine. For example, wear costumes, make-up, or use props that relate to your theme and that make the presentation more fun and entertaining.
3. Successful machine’s use music, sound effects and other devices that engage the audience with their machine.
4. Build a machine that avoids, or at least keep to a minimum, common chain reaction steps like dominoes and marble runs.
5. Like Rube’s cartoons, use everyday objects in your machine -- from tea kettles to bicycles -- and try to use them in unexpected ways.
6. Your Machine Introduction should include the story your machine tells, and an explanation how the steps represent the theme and key elements of the story. The Machine Introduction should not be a step-by-step explanation of how the steps work, but rather a story that references the most unique and important steps of your machine.
7. **40% of your total score** for 1st, 2nd, and 3rd place will be based on criteria evaluated by referees. These scores are based on the FACTS of your machine and how it runs. For example, how many steps did it have, how many interventions were done, how many penalties, did it complete the task?
8. **60% of your total score** for 1st, 2nd, and 3rd place will be based on the views of the judges. One Judge may love the theme and execution of your machine and another may not. Again, the more fun, entertaining and well-conceived your machine and presentation, the higher you’ll score with the judges.
9. **100% of the Judge’s rankings** will be used in awarding these three prizes: the Rube Goldberg Creative Spark Award, the Spirit of Rube Goldberg Award, the Rube Goldberg Teamwork Award. Again, your score in this section will be based exclusively on the judges, personal evaluations of your team and machine.
10. Teams that score highly with Judges are respectful of their teammates and work well together. Teamwork is a huge part of having a successful RGM.
5. COMPETE IN THE ONLINE CONTEST

Complete your Team Page by April 5, 2017.

1. On our web site: Go to Machine Contests. Go to Online Contests. Click Register Now. Create an account. Choose your Division. Fill in your team information and pay the registration fee.
   - You will receive a Welcome email containing:
     - Information on how to set up your Team Page
     - Links for you to download the 2017 Rule Book and the Official Poster.
   - Division I registrants will also get a link for the 2017 Certificate of Ingenuity.

2. Follow the directions on your Team Page and complete the required information by April 5, 2017:
   - School, teacher and team information
   - OUR STEP LIST: A Step list (3 pages maximum).
   - OUR CLOSE-UPS: PHOTOS: A maximum of 3 close-ups (scanned diagrams, photos).
   - OUR CLOSE-UPS: FAVORITE STEP: A close-up video of your favorite step sequence.
   - OUR CLOSE-UPS: TASK COMPLETION: A close-up video of your final step(s) completing the task.
   - OUR MACHINE INTRODUCTION AND WALK-THROUGH: A video explanation of the machine and step walkthrough (3 minutes maximum)
   - OUR MACHINE RUN VIDEO #1
   - OUR MACHINE RUN VIDEO #2
     TWO videos of the entire machine running (2 minutes maximum each).

   **NOTE:** This video must be a single continuous view with the machine in view at all times and no video editing or breaks. Any evidence of editing will result in disqualification.

You can also add a team logo and further customize your Team page (optional).

*Your Team page will only be editable until April 5, 2017.*
6. WIN!

**All Contests**
- All entries will be judged and individual feedback provided. All teams must complete a Team Page.

**ALL LIVE Contests - Division I and II and III**
- Only 1st place teams are eligible for Live Finals.
- For every 20 teams in a Regional, 1 team may attend Finals.
  For every additional 20 teams in a Regional, 1 additional team may attend Finals. (e.g., 21 – 40 = 2 teams advancing).
- After the winners of a Regional are announced, teams advancing to Finals must register for Finals and pay the $395.00 Finals fee at [rubegoldberg.com](http://rubegoldberg.com) by March 1st or as soon as their contest ends.
- If an advancing team from a Regional is unable to participate in a Finals, the next highest scoring team from that Regional may choose to participate in place of the advancing team.

All Division Finals locations and dates will be announced in October, 2016.
Dates will likely be in March or April, 2017 and be on a weekend day.

**All ONLINE Contests - Division I and II and III**
- Registration deadline is March 31, 2017, 11:59 PM EST.
- Team Pages close for editing April 5, 2017, 11:59 PM EST.
- Round 1 Results Announced: April 14, 2017, 11:59 PM EST.
- Round 2 Results Announced: April 21, 2017, 11:59 PM EST.
- Final Round Results Announced: May 1, 2017, 11:59 PM EST.

- See your referee and judges results and judges comments **AFTER winners are announced**. Log in to your Team Page. Click on tab in upper left corner.

**ALL Contests - People’s Choice**
- There will be a People’s Choice winner for Divisions I II III
- People’s Choice for ALL Team Pages of ALL Divisions opens on April 6, 2017, 11:59 PM EST.
- People’s Choice voting closes on April 30, 2017, 11:59 PM EST.
- People’s Choice winners announced for all Divisions on May 1, 2017.

**How to Promote Your Team and Win People’s Choice**
1. Go to the CONTESTS page and click on Live Contest Results and Online Contest Results.
2. Click on ANY TEAM WITH A TEAM PAGE, decide on your favorite and click the “Like” button on a Team Page to cast your vote.
3. That Team Page will be shared on your Facebook page.
4. Team with the most “Likes” wins People’s Choice award!
MACHINE VOLUME WORKSHEET

(Official Team Submission Sheet)

Team Name: __________________________________________
School: __________________________________________
Division: I  II  III (circle one)

STEP 1: Draw the footprint of your machine

NOTE: If any part of the machine falls within a square, you must count the entire square.

STEP 2: Count the number of footprint squares

NOTE: Each square is 1’ x 1’ (0.3 m x 0.3 m)

AREA: _______________ (choose one: ft² or m²)

STEP 3: Measure the height of your machine.

NOTE: The maximum height is 8’ (2.4 m)

HEIGHT: _______________ (choose one: ft or m)

NOTE: If your ENTIRE machine sits on a table, the height of the table may be subtracted from the height of the machine. If only PART of the machine sits on a table, the table height must be included in the height of the machine.

STEP 4: Calculate the volume of your machine

_____________  X  _____________  =  _______________

AREA (ft² or m²)  X  HEIGHT (ft or m) =  VOLUME (ft³ or m³)

STEP 5: Verify machine volume equal to or less than 300 ft³ (8.5 m³)

YOUR MACHINE VOLUME (ft³ or m³) ≤ 300 ft³ (8.5 m³)

_____________  (ft³ or m³) ≤ 300 ft³ (8.5 m³)

We hereby confirm our calculations are correct. We understand at the time of the Contest, our machine will be measured by a referee to confirm our submitted calculations. We also understand that machines exceeding the maximum machine dimensions of 10’ L x 10’ W x 8’ H (3 m L x 3 m W x 2.4 m H) will be disqualified.

Team Advisor/Captain Signature ____________________________ Date_______

Note: Each square is 1’ x 1’ (0.3 m x 0.3 m)

Maximum machine dimensions:
10’ L x 10’ W x 8’ H
2016  Open an Umbrella
2015  Erase A Chalkboard
2014  Zip A Zipper
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
CONTEST CONTACT INFORMATION

Executive Director: Kathleen Felix
rubegoldberg.com

Education Outreach Director: Shawn Jordan, Ph.D

Assistant Education Outreach Director: Drew Wischer

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

“Rube Goldberg Machines shouldn’t add to landfill, they come from landfill.”
– Jennifer George (Rube’s granddaughter)

We encourage the use of recycled, up-cycled and green items