



INTRODUCTION RULE BOOK

RUBE GOLDBERG MACHINE CONTEST HONOR CODE

All Team Leaders and Hosts and Students

The most important rule in our Rule Book - the one which supersedes all others - is the Rube Goldberg Machine Contest Honor Code.

1. By registering and participating in the RGMC, you are obligated to abide by all of its rules.
2. Understand that not doing so may result in your team's disqualification.

Rube Goldberg, Inc.

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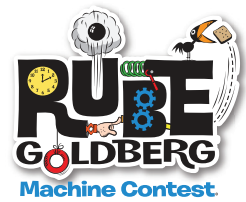


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COSTS & REGISTRATION

PART 1: ALL ABOUT TEAMS, DEADLINES AND PRIZES

TWO WAYS TO COMPETE

- **Live**

Teams build a RGM, transport it to the Host site for which they have registered and compete with other teams. The first and second place winner of each Host site is eligible to compete in Live Finals.

- **Online**

Teams build a RGM, film it, complete a team page and compete with other teams from around the world.

Any individual team may compete in only 1 RGMC, either Live or Online.

- A school/organization may register multiple teams, in multiple contests, but each team/machine must be unique.

COST AND REGISTRATION

There are costs involved with competing in the Rube Goldberg Machine Contest.

- Both Live and Online local/regional registration fees are \$395.per team.
- Fees are payable directly to RGI.

If the fee for the Live contest you choose to enter is less than \$395., it is because the host or a sponsor has underwritten a portion of the fee.

- Live Finals registration fee is \$500.payable directly to RGI.
- Teams are encouraged to undertake community fund-raising efforts (i.e. sponsorship from local retailers or businesses, parent contributions, bake sales, etc). For teams in the Live contest, in addition to registration fees, costs may include transportation of the machine, the team, food and overnight accommodations.
- All payments to RGI are non-refundable.

COMPLETE REGISTRATION

- fill out the registration form at www.rubegoldberg.com
- pay registration fee
- invite all team members and obtain digital parental Consent and Release Agreements

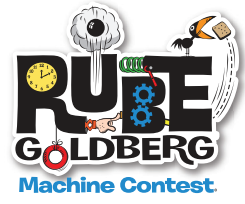
TEAM WELCOME GIFTS

Once registration is complete, Team Gifts will be mailed to the Team Leader at the address provided on the registration form.



CALENDAR AND DEADLINES

PART 1: ALL ABOUT TEAMS, DEADLINES AND PRIZES



Registration is open now for Team Leaders and Hosts!

LIVE COMPETITION	ONLINE COMPETITION
<p>APPRENTICE DIVISION I DIVISION II</p> <p>Team Pages close for editing the day before your Live contest at 11:59 PM EST. Team Pages will be unchangeable after that time.</p> <p>All Division Finals will be held Saturday April 4, 2020 at Lawrenceburg Event Center, Lawrenceburg, IN. Details will follow in January 2020.</p> <p>Check our website often for new and updated Finals information.</p>	<p>APPRENTICE DIVISION I DIVISION II</p> <p>March 25, 2020 - Wednesday 11:59 PM EST Registration closes.</p> <p>April 8, 2020 - Wednesday 11:59 PM EST Team Pages close for editing. Team Pages will be unchangeable after that time.</p> <p>April 9, 2020 - Thursday 11:59 PM EST People's Choice voting starts.</p> <p>April 22, 2020 - Wednesday Round 1 results announced.</p> <p>April 23, 2020 - Thursday 11:59 PM EST People's Choice voting closes.</p> <p>May 4, 2020 - Monday Online FINALS results announced. People's Choice results announced.</p>





TEAM REQUIREMENTS

PART 1: ALL ABOUT TEAMS, DEADLINES AND PRIZES

ALL TEAMS

- Any number of students can participate in designing and building.
 1. **For LIVE regionals and Finals, we suggest a team limit of 14.**
 - Only 14 (or fewer - see NOTE below) will be allowed to participate in LIVE contests.
 - Gifts and pins will be supplied for 14 Team members and 1 Team Leader.
- NOTE: There may be a cap of 14 or under based on capacity, fire codes and expected attendance. Check with your Host site.
2. **ONLINE teams can have unlimited members.**
 - **Gifts and pins will be supplied for 14 Team members and 1 Team Leader.**
- must have a non-student Team Leader 18 years of age or older.
 - can have only ONE Team Leader. All emails, mailings and information will go to 1 person only.
 - must have at least 3 eligible members.
 - team members must be elementary, middle or high school students
 - team members must be the correct age for their Division

Division	Age Requirement	Team Leader
APPRENTICE	8-11	Each team must have a Team Leader who will be present at the contest.
I	11-14	
II	14-18	
NOTE: A team member must fall within the age range for their division by June 15 th , 2019.		

Once the Team Leader has registered their team, paid the fee and approved all qualified team members**, Team Gifts will be **mailed to the Team Leader at the address provided during the registration process.**

** Qualified Team Member is one who has electronically filed their Consent and Release agreement online at www.rubegoldberg.com.

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 **with prior approval from host.**

Any non-team member assisting in set up of the machine - without prior permission from the Host - will cause the team to incur a 10 point penalty.



COMPETE IN THE LIVE CONTEST

PART 1: ALL ABOUT TEAMS, DEADLINES AND PRIZES

Once a Team Leader chooses a Host, sets up an account and registers and pays, they will:

- receive a **Welcome email** and be able to access their Team Page.
- be able to access the 2020 Complete Rule Book, Certificate of Ingenuity, sample emails for Sponsorship, and contest artwork **from their account page**.
- be able to **Invite Team Members**.
 - Team rosters must be completed a minimum of 2 weeks prior to your registered contest date.

ALL TEAMS MUST COMPLETE A TEAM PAGE

Complete your Team Page 2 weeks prior to your competition.

- Team page must include:
 - Team photo
 - team name, team leader and team information
 - completed Step List that **highlights Simple Machines** (see page 14)

NEW

DIVISION I AND II will be scored by judges and referees.

APPRENTICE will be scored only by judges, and will not be refereed. Regional Hosts will not need to assign referees to this division.

Moving on to Finals

- Both 1st and 2nd place winners of Division I and II regionals are eligible to compete in Finals. Apprentice teams that win in each of the 3 judged categories are eligible to compete in Finals.
- After the winners of a Regional are announced, and the Host has marked team places, teams advancing to Finals must go to their Team Page to register and pay for Finals by March 7th or as soon as their contest completes.
- 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.



COMPETE IN THE ONLINE CONTEST

PART 1: ALL ABOUT TEAMS, DEADLINES AND PRIZES

REMEMBER: Online RGMs have NO dimension restrictions. Build your machine any size you want! It can go out the door and down the hall! Or across a football field! Make sure you can film it in 1, unedited shot.

SEE ALL Online Contest Dates on page 4: CALENDAR AND DEADLINES

ALL TEAMS MUST COMPLETE A TEAM PAGE

Once a Team Leader chooses Online, sets up an account and registers and pays, they will:

- receive a **Welcome email** and be able to access their Team Page.
- be able to access the 2020 Complete Rule Book, Certificate of Ingenuity, sample emails for Sponsorship, and contest artwork **from their account page**.
- be able to **Invite Team Members**.

All Team Page info and Team Rosters must be completed by **April 8, 2020 11:59 PM EST**.

- Team page must include:
 - Team photo
 - Team name, team leader 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 THEATRICAL/VERBAL PRESENTATION: A great RGM tells a story. And the story is introduced through an entertaining verbal presentation. Note: this should not be a step by step explanation of how the transfers of energy work. (2 minutes maximum)
 - OUR MACHINE RUN VIDEO #1 - 3 minutes maximum run time
 - OUR MACHINE RUN VIDEO #2 - 3 minutes maximum run time

Make sure: Each video must be a single continuous view of TWO DIFFERENT machine runs. These may NOT be two videos of the same machine run from different angles. The machine run videos must have the machine in view at all times with NO video editing or breaks. Any evidence of editing will result in disqualification. Please factor this into your build as the filming of your machine can be just as important as the machine itself!

Where and How to see your scoring results and judges comments AFTER each round is announced.

1. Log in to your Team Page
2. Up in the left corner is a red SCORE TAB
3. Click on the tab to see scores and comments
4. Scroll to the bottom to see how you did in each round and to see if you move on to finals.

How to Promote Your Team and Win People's Choice

There will be an Online People's Choice winner for Apprentice, Division I and Division II . You need to have a Facebook account and you can only vote once.

1. Go to CONTESTS on rubegoldberg.com.
2. Click on ARCHIVES.
3. Click on Vote People's Choice.
4. Click on ANY ONLINE TEAM WITH A TEAM PAGE, decide on your favorite and click the "Like" button on a Team Page to cast your vote.
5. That Team Page will be shared on your Facebook page.
6. Team with the most "Likes" wins People's Choice award!



HOW TO REGISTER A TEAM

PART 1: ALL ABOUT TEAMS, DEADLINES AND PRIZES

PART 1:

1. All contest information and material will be sent to the Team Leader's email and/or address on the registration form.
2. Go to rubegoldberg.com
3. Click on CONTESTS
4. Choose **Live Team** or Online **Team Registration**
 - 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.
5. If you choose Live, **select a Division and Host location**. If you choose Online, **select a Division**.
6. Create an account.
(Remember your login and password as you will need to access your Account Page to download the Complete Rule Book, art work, Sponsorship sample .docs)
7. Follow the prompts: Fill out the registration form. Click Submit. Choose **Pay by Paypal** and pay the fee. Or chose **Pay by PO** (you must enter the PO#). An auto invoice will be sent to the email on the registration form.

It is the responsibility of the TL to get the Invoice to their accounts payable and make sure payment it made to RGI. We prefer payment via Paypal. NO REFUNDS OR CREDITS WILL BE GIVEN.

PO's must be paid 4 weeks prior to your registered Contest date, or Teams will not be allowed to participate.

PART 2:

INVITE TEAM MEMBERS

Team Leaders must INVITE Team Members. This function is only activated once payment is made via PAYPAL or a PO# is entered on the Invoice request form.

1. Click on the **green button** (Invite Team Members) and put in team member info.
Team Leaders will need to have parent emails. Put the parent email in the invitation.
2. Scroll to the bottom of the list and click Send Invitations .
3. **Team Member parents** (or Team Members if they are 18 years of age or older) must click on the link they have received and **read and click I AGREE** on the Consent and Release.
 - We will no longer accept paper versions of the Consent and Release. Team Leaders must assist parents who do not have computers, in completing this portion of the registration process.
4. Your Team Members will appear in the left hand column on your Team Page. If you want to Invite additional Team Members, click the **green button** (Invite Team Members) and follow the procedure.
 - The Team roster (Invite process) must be completed a minimum of 2 weeks prior to your registered contest date.

Contest participation implies consent to use Contest photographs in all forms of publicity.
Please see the Terms and Agreements at <https://www.rubegoldberg.com/contests/>.



PRIZES

PART 1: ALL ABOUT TEAMS, DEADLINES AND PRIZES

LIVE CONTESTS

REGIONALS:

Apprentice Division

- Plaques for each of the 3 judged categories.
- Each team member of a placing team will receive a commemorative ribbon

Divisions I and II

- 1st, 2nd and 3rd place plaques
- Each team member of a placing team will receive a commemorative ribbon.

FINALS:

Apprentice – 3 Judged categories

- A team trophy
- \$500 award
- Each team member of a placing team will receive a commemorative ribbon.

Divisions I and II – 1st place teams

- A team trophy
- \$1000 award
- Each team member of a placing team will receive a commemorative ribbon.

Divisions I and II – 2nd place teams

- A team trophy
- \$750 award
- Each team member of a placing team will receive a commemorative ribbon.

Divisions I and II – 3rd place teams

- A team trophy
- \$500 award
- Each team member of a placing team will receive a commemorative ribbon.

Apprentice, Division I and Division II

- 1 Team in each Division will be awarded a Slinky Trophy and \$250.

ONLINE CONTESTS

FINALS:

Apprentice Division

- A team trophy for each of the 3 judged categories.
- One copy of “Rube Goldberg’s Simple Normal Humdrum School Day” book for each of the 3 teams that win one of the 3 categories.
- Each team member of a placing team will receive a commemorative ribbon.
- Free registration in our 2021 Contest.

Divisions I and II – 1st place teams

- A team trophy
- \$500 award
- Each team member of a placing team will receive a commemorative ribbon.
- Free registration in our 2021 Contest.

Divisions I and II – 2nd place teams

- A team trophy
- \$250 award
- Each team member of a placing team will receive a commemorative ribbon.
- Half price registration in our 2021 Contest.

Divisions I and II – 3rd place teams

- A team 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, Rube’s granddaughter.
- Half price registration in our 2021 Contest.
- Each team member of a placing team will receive a commemorative ribbon.

Apprentice, Division I and Division II – People’s Choice winners

- A team trophy

Apprentice, Division I and Division II

- 1 Team in each Division will be awarded a Slinky Trophy and \$100.



SPECIFICATIONS AND RULES FOR ALL CONTESTS

PART 2: MACHINE SPECS AND SCORING

Machine Specification	Value
Minimum Number of Steps (Transfers of Energy)	Apprentice: 10 Division I: 15 Division II: 20
Maximum Number of Steps (Transfers of Energy) (Not applicable for ONLINE Contest)	All Divisions: 75
Physical size (Not applicable for ONLINE Contest) Machine must remain in required space at all times, even when it moves or rotates in anyway	Maximum Dimension L x W x H 10' x 10' x 8'
Theatrical / Verbal Presentation	Maximum 2 minutes
Reset Time Any number of team members may participate in reset of machine. (Not applicable for ONLINE Contest)	Maximum 8 minutes
Single Run Time (Only 2 members of the team may interact with the machine during the run.)	Maximum 3 minutes
Air compressor hoses running to 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, flames	Not allowed
Electrical arcing	Allowed with safety approval of Host.
Use of Live Animals	Not allowed (but humans are permitted as long as they do not actually interact with the machine)
Humans in the machine. Max 1 per machine and human must be a registered team member.	A person may start the machine. A person may be in the machine. If they touch anything in order to effect a transfer of energy, that will be scored as an intervention and lower the scoring for the machine.
Inclusion of Simple Machines: Lever, Wheel & Axle, Pulley, Inclined Plane, Wedge, Screw	Not mandatory, but each unique use increases score. See page 14.
Corporate logos	Allowed with written permission from logo owner. All responsibility for copyright permission rests with the team.
Intentional Damage to Machines, Violent acts, and/or Use of profane indecent, or lewd expressions - by any team leader, member, or adult accompanying a team - while at the contest venue.	Not permitted and may result in disqualification, removal from the venue, and/or prohibition from future competitions as determined by the Host.
Objects flying beyond machine boundaries	Deduction of 5 points per object including drops of water, slivers of balloon, and other small objects. Steam and other gases are exempt from this provision.
Safe for participants and observers	Required. Questionable items must be approved by the Contest Host prior to the contest.

Refereed Machine run Specifications	Minimum	Maximum
Theatrical / Verbal Presentation	None	2 minutes
Team members interacting with the machine during refereed and judged operations. Other team members MAY NOT yell out check list items or assist in any way.	None	2 team members
Reset time limit	None	8 minutes
Team members interacting with the machine during Reset time limit	None	Any number of team members



HOW TEAMS AND MACHINES ARE EVALUATED

PART 2: MACHINE SPECS AND SCORING

DIVISION I AND II

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

- **REFEREES:** These individuals have the ability to evaluate the machines (engineers, science teachers, detail oriented, contest organizers and contest veterans). They sweat the small stuff and fully understand the contest rules and specifications.

What they do: Referees use specific criteria to quantitatively evaluate teams and machines in the categories found on the Referee Form.

- **JUDGES:** These individuals have artistic backgrounds (artists, sponsors, celebrities/local personalities and recognize team spirit, communication, and the fun, playful and creative elements of RGMs.

What they do: Judges use their expertise to evaluate teams and machines in the categories found on the Judging Form.

- **SCORING CAPTAIN**

The Captain will meet with Refs and Judges at least 1 hour before the contest and instruct them in proper procedures in compliance with RGI Rules and Scoring.

All paper ref and judging forms will be input, by the Captain, into the Excel score sheet for final team scores.

- **TIMEKEEPERS** (Optional. Referees can also be time keepers)

APPRENTICE DIVISION

Teams and machines are evaluated by Judges only.

- **JUDGES:** These individuals have artistic backgrounds (artists, sponsors, celebrities/local personalities and recognize team spirit, communication, and the fun, playful and creative elements of RGMs.

What they do: Judges use their expertise to evaluate teams and machines in the categories found on the Judging Form.

- **SCORING CAPTAIN**

The Captain will meet with Judges at least 1 hour before the contest and instruct them in proper procedures in compliance with RGI Rules and Scoring.

All paper judging forms will be input, by the Captain, into the Excel score sheet for final team scores.

- **TIMEKEEPERS** are not necessary for Apprentice Division.

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



HOW SCORING WORKS

PART 2: MACHINE SPECS AND SCORING

1. Scores are based on two different criteria, REFEREE (objective) and JUDGE (subjective). Scores on paper forms will be entered into the excel score sheet. The team with the highest score wins.
2. Referees and judges use PAPER FORMS to score teams. FORMS can be found in the Rule Book.
3. A SCORE-KEEPER enters both referee and judges scores into an Excel score sheet
4. Division I and II: The top three scoring teams will place 1st, 2nd and 3rd.

Apprentice will be judged (there is no refereeing in Apprentice) in each of the 3 categories:

- Professor Butts' Creative Spark
- Rube Goldberg Spirit of Hilarious Invention Award
- Rube Goldberg Teamwork Award.

5. In the event of a tie:

REGIONAL SUGGESTIONS:

1. The team with the most steps
2. The machine with the fewest interventions across both scored runs
3. Have a run off between the tied teams. The machine with the fewest interventions wins.
4. The longest machine run up to the maximum of 3:00 minutes

AT NATIONAL FINALS:

1. Each team will receive a trophy and they will split the prize money.
6. The three write-in awards (Best Final Step, Best Single Step and Legacy) are optional. Host may purchase these awards, in addition to 1st, 2nd and 3rd. See page 7. **BONUS AWARDS PACKAGE.**
7. After final tabulations are calculated, TROPHIES/PLAQUES will be awarded.
8. SCORES ARE FINAL
9. Excel score sheets will be emailed to participating teams within 7 days of FINALS completion.

For each group of 8 teams:

FLOOR STAFF: Minimum of 2 refs and 3 judges -- 5 total

JUDGING ROOM STAFF: 1 score-keeper (inputting ref and judges scores into Microsoft Excel), 1 scanner to scan paper score sheets -- 2 total

1. Each machine will be evaluated by 2 referees who will score the machines together on 1 Referee form.
2. Each team and machine will be evaluated by 3 judges. Each judge will fill out an individual Judge Form.
3. Each team will run their machine a total of 2 times.
4. It is optional for Hosts to assign each team a time for Referees to view their machine.
5. Judges should be walking the floor during set-up time and during the contest to observe teamwork and insure that no non-team members are assisting in set up of the machine.

For Competitions with more than 8 teams:

1. Divide teams into even groups.
2. Run the groups simultaneously.
3. Have enough Staff to accommodate all groups.

Conduct

Any team or team leader displaying unsportsmanlike behavior at any time at Finals, will be immediately disqualified from the competition.

SEE THE RULE BOOK FOR ALL SPECIFICATIONS AND RULES



HELPFUL HINTS ON HOW TO WIN

PART 2: MACHINE SPECS AND SCORING

Theme: Build a recognizable theme into your machine. Strive to create an image for your team based on that theme using costumes, make-up, or props that make the verbal presentation more fun and entertaining.

Verbal Presentation: 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 your narrative. The Machine Introduction should not be a step-by-step explanation of how the steps work. This is where your personality, humor, and team spirit engages the audience and gets them excited to see your machine.

Materials: RGMs should be "green" machines, made of as many recycled items as 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! Use 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 dominoes 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 dominoes falling onto each other will be counted as one step.

NEW **Simple Machines:** There are 6 simple machines you can build into your RGM to garner points. See Page 14.

Sound Effects: Successful machines use music, sound effects and other devices that engage the audience with their machine.

Humor: Rube Goldberg was both an engineer and a cartoonist. In theory all of his wacky inventions would work, but his main goal was to make you laugh! So...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 diverse members from engineers to artists, mathematicians to comedians, all working together.

Teamwork: 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.

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: Design and build your machine modularly so transportation is easy and efficient. 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.

[Click on CONTESTS.](#) [Click on Archives in the veil.](#) [Choose a contest.](#) [Click on any Online Team Page and see videos and photos of past contests.](#)

SIMPLE MACHINES

PART 2: MACHINE SPECS AND SCORING

The 6 Simple Machines are: wedge, wheel and axle, screw, inclined plane, lever and pulley.

Use every day and re-purposed objects in creative ways to put Simple Machines in your RGM. Each **single use** of the 6 simple machines is worth 3 points (Max 18 points). **i.e.: If you have 3 levers, you only get points for 1.** Make sure you **highlight them in your printed step list** for the Refs.

A **Wedge** is a piece of wood, metal, or some other material having one thick end and tapering to a thin edge, that is driven between two objects or parts of an object to secure or separate them.

Synonyms: doorstop, chock.



A **Wheel and Axle** is a simple lifting machine consisting of a cylindrical drum or shaft joined to the wheel to provide mechanical advantage.

Synonyms: axis, shaft.



A **Screw** is a short, slender, sharp-pointed metal pin with a raised helical thread running around it and a slotted head, used to join things together by being rotated so that it pierces wood or other material and is held tightly in place.

Synonyms: bolt, fastener.



An **Inclined Plane** is a plane inclined at an angle to the horizontal; sloping ramp up which heavy loads can be raised.

Synonyms: ramp, slant, gradient.



A **Lever** is a rigid bar resting on a pivot, used to help move a heavy or firmly fixed load with one end when pressure is applied to the other.

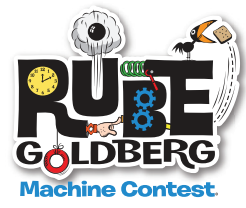
Synonyms: crowbar.



A **Pulley** is a wheel with a grooved rim around which a cord passes. It acts to change the direction of a force applied to the cord and is chiefly used to raise heavy weights.

Synonyms: sheave, drum.





CONTEST FAQs

PART 4: CONTEST FAQs (page 1)

Q: What kind of a light? Do we have to use a bulb? What type and size?

A: It is up to you to interpret the task in a way that will impress the judges and give you the highest score.

Q: Can our RGM turn off more than one light?

A: YES. But the final step, must also turn off a light.

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: May we use more than one slinky in our machine?

A: You may, but we suggest you only use one slinky in the coolest way possible. That's what you'll be judged on.

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 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.

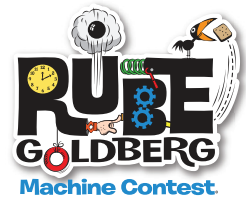
Q: Can I enter a machine that has been previously built and posted online?

A: No. All entries must be new machines built for entry into the current Contest.

(continued on next page)

CONTEST FAQs

PART 4: CONTEST FAQs (page 2)



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: Can we have a human in our machine?

A: Yes. Max 1 per machine and human must be a registered team member. A person may start the machine. A person may be in the machine. If they touch anything in order to effect a transfer of energy, that will be scored as an intervention and lower the scoring for the machine.

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 machine dimensions. 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: We're going to Finals! Can we add to or re-work our machine from what we had during our regional as long as it stays within the regulations?

A: Yes

Q: Is there a limit of plugging in a power strip and running more than two cords inside our machine?

A: Two auxiliary umbilicals per machine. This can be air, electrical, water, etc. Once they get into the boundary of the machine, it's part of the machine and thus able to be distributed as needed.

Q: Can a different person or persons give the machine presentation, or does it have to be one of the two designated people that are running the machine?

A: It can be a different person. We don't specify a limit, so it can be the whole team (and often is!)