



INVENTOR'S JOURNAL

Tracking your Invention
Journey in Innovation

a program of



University of New Hampshire
Leitzel Center

HELLO INVENTOR!

Welcome to the Young Inventors' Program and the world of invention. As you begin your journey, we encourage you to take positive risks. Ask questions. Be creative. Most importantly, do not be afraid to fail. Innovation is all about testing and re-testing and pushing boundaries to make the world a better place. No matter where your journey takes you, you will learn new things, challenge yourself, and ultimately be successful.

Tell the Story of Your Rube Goldberg Machine

This Inventor's Journal is a place for you to record your ideas, activities, research, and discoveries as you create your own Rube Goldberg Machine. The journal is not a book report that is created after you are done. It is a diary that is continuously filled in as you work. The purpose of the journal is to tell the story of your complex machine. For every step, you will record what you did, why you did it, and how you did it. Invention journals are important because they provide a complete and accurate record of your ideas, plans and processes by which your machine was created. It is proof that you came up with the ideas on your own.

About the YIP Rube Goldberg Machine Inventor's Journal

Your YIP Rube Goldberg Machine Inventor's Journal includes worksheets and activities that you will do in your YIP program. You can write on these pages as you do the activities with your classmates or on your own. You can take notes, draw pictures, and write down key words. Adults may help you with your writing if needed. The rest of the journal is an open space for you to record your own invention story – you can add more notes or drawings or show how you make changes to your design ideas over time.

You do not have to complete every page and you can always go back to pages as you work. Your teacher will guide you through it. But remember, never erase! If you make a mistake or make a change, simply cross it out, and then make your new notes. Your missteps and modifications are valuable parts of your story.

You are welcome to insert additional pages to your journal. Simply staple or clip them in. You may add photographs of yourself working on your invention, drawings, notes taken on different paper, or other records you may have. Each time you record an entry, be sure to sign and date the page at the bottom. If you are working with a team, each team member will keep their own journal, but all team members should sign each other's journals each time you work together.

When your YIP Rube Goldberg Machine Inventor's Journal is complete, it will become part of your final project presentation. Your teacher may give you more guidelines and requirements for your journal, so be sure to follow them.



Have fun and good luck!

The YIP Team



Rube Goldberg Machine Inventor's Journal

This Journal tracks the innovations by

Inventor Name:

Grade: _____

School/Organization Name:

Teacher/Leader Name:



STATEMENT OF ORIGINALITY

I promise that the ideas in this Rube Goldberg Machine Inventor's Journal are my own. (For a team project, all members of the team should have their own logbook but complete this statement together and all members should sign.)

Inventor Name(s):

Signature(s):

Date: _____

Grade: _____

School/Program: _____

Town: _____





RUBE GOLDBERG MACHINE INVENTOR'S CHECKLIST

Checklist of the Rube Goldberg Machine Design Process

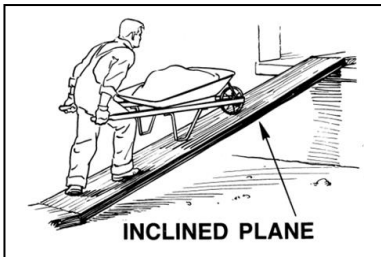
Inventor's Name

- Identify how the assigned task will be solved
- List the simple machines used in the Rube Goldberg Machine (must include at least 4 simple machines)
- Explain the steps that complete the assigned task from start to finish (must include at least 10 steps)
- Draw design ideas
- Make your Rube Goldberg Machine
- Determine if the machine can successfully complete the assigned task start to finish
- Improve your machine as needed
- Present your ideas
- Have fun



SIMPLE MACHINES

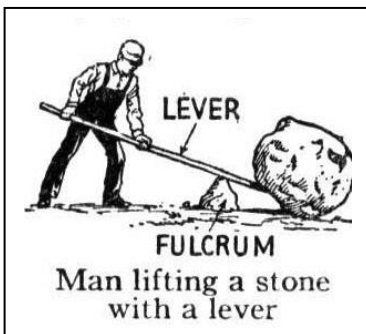
INCLINED PLANE



Makes it easier to move objects upward, but you have to go further horizontally.

Examples: highway or sidewalk ramp, wheelchair ramp, stairs, playground slides

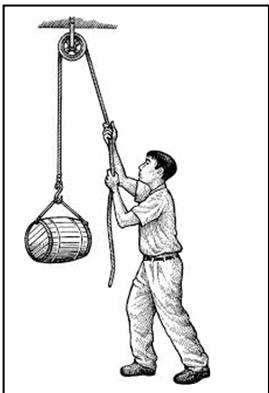
LEVER



Makes lifting weight easier by using a fulcrum to redirect force over a longer distance.

Examples: see-saw, dump truck, broom, crane arm, hammer claw, crowbar, fishing pole, screwdriver, bottle opener

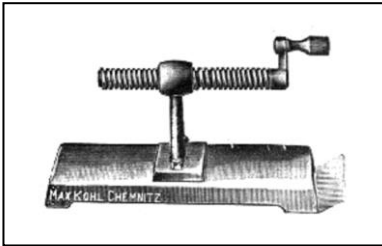
PULLEY



Makes lifting things with a rope easier by redirecting force and the addition of additional pulleys.

Examples: flagpole, elevator, sails, fishing nets, clothes lines, cranes, window shades and blinds

SCREW

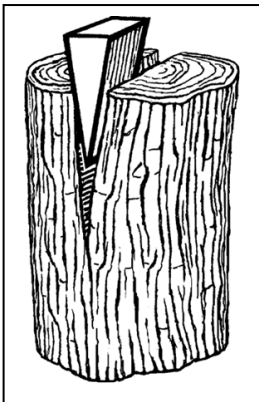


Turns rotation into lengthwise movement

- Takes many twists to go a short distance
- Holds things together

Examples: jar lids, spinning stools, light bulbs, faucet handles

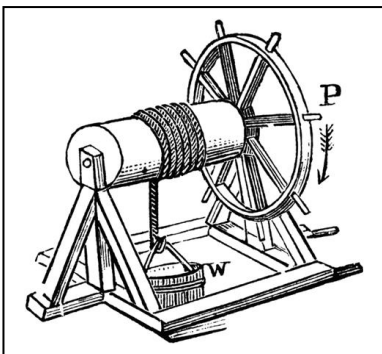
WEDGE



Pushes materials apart, cuts things

Examples: scissors, knife, doorstop, nail, saw, bulldozer, snow plow, zipper, airplane wing, bow of a boat or ship

WHEEL & AXLE



Makes it easy to move things by rolling them, and reducing friction

Examples: cars, bicycle, office chair, wheelbarrow, shopping cart, hand truck, roller skates

RUBE GOLDBERG MACHINE DESIGN PLAN

Student Inventor/s:	Date:						
<p>What are some creative ways I can solve the assigned task of: <u>PUT TOOTHPASTE ONTO A TOOTHBRUSH</u></p> <p><u>BE CREATIVE!! Ask myself:</u> -Does it have to be a real toothbrush, or could a toilet plunger with mop bristles do the job? -Could I brush my teeth with peanut butter? (Yes. Yes, I could.)</p>							
<p>What Simple Machines can I use? (You must use at least 4 machines). How will I use them in my machine?</p> <table><tr><td>1.</td><td>4.</td></tr><tr><td>2.</td><td>5.</td></tr><tr><td>3.</td><td>6.</td></tr></table>		1.	4.	2.	5.	3.	6.
1.	4.						
2.	5.						
3.	6.						

The design for my machine will work in the following steps (The final step solves the task, the first step is triggered by you). A step = pieces of the puzzle / each piece of your machine.

1.

2.

3.

4.

5.

6.

7.

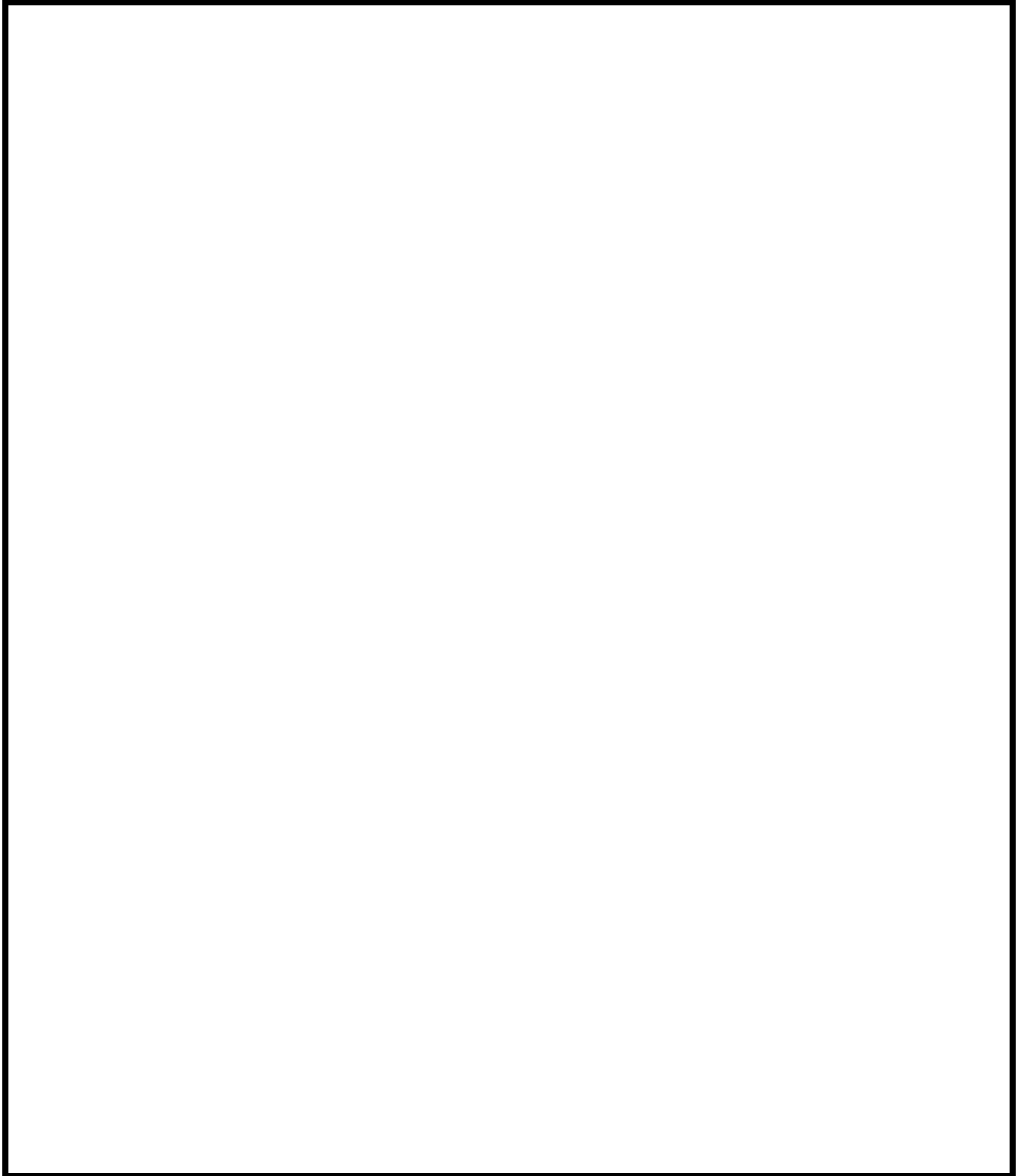
8.

9.

10.

_____ **to put toothpaste onto the
toothbrush!**

Draw a diagram of your Rube Goldberg Machine prototype. Be sure to label each simple machine and briefly describe what they will do and how they will fit together to make the machine work. Be as detailed as possible in your design. Remember: it is PERFECTLY OKAY to change your design later!



RUBE GOLDBERG MACHINE TESTING FEEDBACK GRID

It's time to test! Use this grid to help you evaluate your prototype and see where you want to make changes.

<p>What did you like about your machine? What went well?</p>	<p>What failed (if anything)? Why did that step fail? How can I fix that to ensure it won't fail again?</p>
<p>How can I increase reliability to make sure my machine will work more often?</p>	<p>What can I do better next time? Are there different items I could add to my machine that would improve it?</p>

CHANGES TO MY RUBE GOLDBERG MACHINE

After testing and feedback, I will make changes to my original design plan.

RUBE GOLDBERG MACHINE NAME IDEAS

Pick one word/prefix/phrase from Group A and one word/suffix/phrase from Group B that seem to really “fit” your Rube Goldberg Machine. Now put them together. Try saying them quickly, and then reverse the word order. Add other words and try several different combinations to see if you can come up with something you like. Ask your friends what they think. List all your ideas.

GROUP A		GROUP B	
Aqua	Photo	Mister	Away
Travel	Handi	-Izer	Minder
Thermo	Micro	2000	N’ Go
Medi	Pet	Meter	Buster
Ele-	Sleep	-Ator	A-tron
Opti-	Auto	Aid	Ease
Work	Accu	Saver	Alarm
Pest	Compu-	Mate	- O
Mega	Safety	Be-gone	Feeder
Baby	Farmer’s	Max	Glow
Audio	Quick	Buddy	Flex
E-Z	Info	Tote	Freeze
Presto	Super	Rider	Shovel
Tele	Step	No-More	Helper
All-in-one	Pro	Finder	Sure
Nite	Cozy	Shield	Alert
Kiddie	Mini	Pal	Tech
Brush	Tooth	Paster	Brusher

MY RUBE GOLDBERG MACHINE NAME IDEAS

1. List all the key words and ideas you have for a name for your Rube Goldberg Machine below. You may try to combine words or rearrange them, add other words and try different combinations.

2. List at least 2 ideas you have for your Rube Goldberg Machine name. You may use your ideas from above to help you. Then take a poll (vote) of your classmates. Which name do they like best? Record the number of votes each name gets in the chart below.

Name Idea	Number of Votes

3. Select your favorite name.

My Rube Goldberg Machine is called the

RUBE GOLDBERG MACHINE JOURNAL PAGE

Record steps to develop ideas, research, and notes as you build your Rube Goldberg Machine.

Inventor's signature: _____

Date: _____

RUBE GOLDBERG MACHINE JOURNAL PAGE

Record steps to develop ideas, research, and notes as you build your Rube Goldberg Machine.

Inventor's signature: _____

Date: _____

RUBE GOLDBERG MACHINE JOURNAL PAGE

Record steps to develop ideas, research, and notes as you build your Rube Goldberg Machine.

Inventor's signature: _____

Date: _____

INVENTION COMPETITION REQUIREMENTS

All projects must have the following components



YIP Inventor's Journal or logbook (hardcopy or electronic version)

The journal documents the student's journey and all aspects of the design process. Journals should be used throughout the development of the project and should not be a report completed after the fact. The journal/logbook should include the following:

- Title Page with Student(s) name(s), grade, school, city and state
- Statement of Originality
- At least one labeled design/sketch/diagram of Rube Goldberg Machine
- My Rube Goldberg Machine Design Plan (description of the simple task the machine will complete)



Project Presentation

YIP inventors are asked to speak about their Rube Goldberg Machine project for up to 3 minutes during the invention convention and then will have 2 attempts to put their machine into action to perform the task successfully. Inventors should share their idea and how it was developed as they talk about the process they took to design and build their RGM, their tests and results, changes made to the design and challenges they faced throughout the process. Inventors may show drawings and reference their RGM as a visual prop as they speak. Young inventors (grades K-2) may use notecards or be prompted by nearby adults; inventors in grades 3-4 may use notecards; and inventors in grades 5-12 may not use notecards. All presentations should include the following:

- Student's name(s)
- Student(s) Grade
- School Name, City and State
- Name of Rube Goldberg Machine



Video Presentation

All inventors must submit a pre-recorded video presentation for competition. The video must be 3-6 minutes in length and must be recorded in a continuous take and unedited. Videos will be used to evaluate originality of the idea and may be used for competition if the format of the competition is changed last minute as deemed necessary by the Young Inventors' Program. Videos should be a recorded version of the project presentation/pitch (or similar). Inventors are encouraged to stand in front of their Rube Goldberg Machine and show their machine working from start to finish during the video. All video presentations should include the following:

- Student's name(s)
- Student(s) Grade
- School Name, City and State
- Name of Rube Goldberg Machine



Rube Goldberg Machine

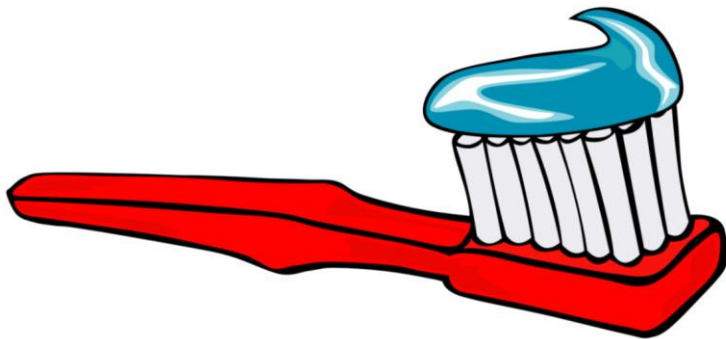
The Rube Goldberg Machine itself is the heart of the invention project and is a required element for competition. A small display may accompany the machine, but the machine serves as the main attraction for this category.

Rube Goldberg Machines must include the following:

- Student(s) name(s)
- Grade(s)
- School name
- School city, state
- Rube Goldberg Machine Name

The 2024 Assigned Task ALL Students/Teams MUST solve is:

PUT TOOTHPASTE ONTO A TOOTHBRUSH



Inventors must have a working model of their Rube Goldberg Machine to solve the assigned 2024 task of: **PUT TOOTHPASTE ONTO A TOOTHBRUSH**. The task must be the final step of the machine, which inventors are encouraged to solve in as unique a manner as possible. For example:” *if you happen to brush your teeth with peanut butter - weird, but cool! What if your toothbrush is a toilet plunger with a mop head for bristles? - I’m not using that on my teeth, but that still counts!*” You are allowed to physically pick up the toothbrush and brush your own teeth after the machine completes the task. Just be sure it’s clear, either in your presentation or physically, that some form of toothpaste ends up on some form of brush that could brush teeth. The emphasis of Rube Goldberg Machines are their creativity and humor.

Rube Goldberg Machine Specifications and Rules

	Apprentice Level: Grades K - 5	Division I: Grades 6 - 8	Division II: Grades 9 -12
Maximum Physical Size	6ft (W) x 6ft (L) x 6ft (H)	8ft (W) x 8ft (L) x 8ft (H)	10ft (W) x 10ft (L) x 10ft (H)
Minimum Number of Steps (Transfers of Energy)	10 Steps	15 Steps	20 Steps
Maximum Number of Steps (Transfers of Energy)	None		
Theatrical / Verbal Presentation	Three (3) Minutes or Less		
Single Run Time	Maximum Three (3) Minutes		
Guaranteed Number of Machine Runs	Two (2) Runs		
Hazardous Materials, Explosives, Flames, Electrical Arcing	Not Permitted		
Incorporation of Live (or Previously Alive) Animals	Not Permitted - Including Taxidermied Animals		
Political References	Not Permitted		
Objects Flying Beyond Machine Boundaries	Allowed with PRIOR Safety Approval from a Teacher (Balloons, Confetti, Small Amounts of Water, etc)		
Rube Goldberg Machine Steps vs Chain Reaction Device Interactions	Standard domino topples & simple marble run style steps are DISCOURAGED - BE CREATIVE!!!		

All Rube Goldberg Machines must also:

- Include appropriately labeled steps and machine components
- Incorporate a minimum of 4 of the following simple machines
 - Wheel & Axle
 - Screw
 - Pulley
 - Wedge
 - Inclined Plane
 - Lever

Inventors are encouraged to build machines that are “materials neutral”, meaning they can be made of reused and recycled materials and the overall product should not require money to buy materials. Any materials that are used, whether purchased or found/borrowed, should be listed in the Materials List in the inventor’s journal/logbook.

Project Restrictions

The following items are not allowed on your person or in your project:



Electric stun guns, martial arts weapons, or dangerous devices



Guns, replica guns, ammunition, and fireworks



Knives of any size



Mace and pepper spray



Razors and box cutters

If a project requires batteries, these must be provided by the inventor.

Additional Resources

Zach Umperovitch, the World's Leading Authority in Rube Goldberg Machines, has worked closely with the Young Inventors' Program for nearly a decade, serving as a YIP Head Judge, performing educational outreach, as well as helping to develop our Rube Goldberg Machine curriculum. He is a three-time Guinness World Records breaker, Professional RGM builder (including OkGo, Disney, Sonic, RedBull, and many others), National Contest Director at the Rube Goldberg Institute, and the Creator and Co-Host of "[Contraption Masters](#)" on Discovery Channel. Through partnership with YIP, his Youtube channel: [Zach's Contraptions](#), features video resources for students and educators specifically designed to provide simple to follow guidance, examples, and advice for building RGMs.

[Instructional Videos for help building your Rube Goldberg Machine can be found at:](#)

<https://www.youtube.com/ZachsContraptions>



Playlist: [How to Build Your Own Rube Goldberg Machine!](#)



a program of the University of New Hampshire Leitzel Center
<https://www.unh.edu/leitzel-center/young-inventors-program>