



RUBE GOLDBERG MACHINES

LESSON 1: Who was Rube Goldberg?

LESSON OVERVIEW	GRADE LEVEL	BASE LESSON TIME
In this lesson, students will be introduced to Rube Goldberg Machines and how they combine a series of everyday objects in a comically complicated “chain reaction” effect to complete an ordinary, simple task. Students will learn about Rube Goldberg, his wacky cartoons, and how he has come to be known for his examples of these complex machines.	K-8	40-50 minutes <i>More time is used if playing MouseTrap Board Game.</i>

TEACHER/LEADER TIPS

Teachers may choose to play the Mousetrap Game in class as part of this lesson as a hands-on example of how a simple task can be made complicated in a Rube Goldberg Machine. Please allow more time for this lesson if playing the board game with students.

We recommend teachers use the video links below for demonstrating high quality Rube Goldberg Machine examples to students. Educational video resources focused directly toward YIP RGM students can be found here: <https://tinyurl.com/24fa3ztb>

A preset video playlist of additional Rube Goldberg Machines can be found here: <https://tinyurl.com/yju4ec95>

Teachers may choose to show the accompanying Google Slides: Rube Goldberg Machine Lesson 1 with the class while guiding students through the lesson.

TEACHER RESOURCES

Zach Umperovitch, the World’s Leading Authority in Rube Goldberg Machines, has worked closely with YIP for nearly a decade, serving as a YIP Head Judge, performing educational outreach, as well as helping to develop our RGM 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.

Zach is based in New England and is available for in classroom STEM Educational Workshops (K-12), Presentations, Hands-On learning programs, and more. For scheduling, visiting [his website](#), or send an email to Zach@RubeGoldberg.org

GETTING YOURSELF READY

Materials:	Your Preparation:	Agenda:
<ul style="list-style-type: none"> • Google Slides: YIP RGM Lesson 1: Who Was Rube Goldberg? • MouseTrap Board Game (optional) • <u>Video Link #1</u> (included in Google Slides): Disney RGM (0:15) https://www.youtube.com/watch?v=eXD5FFwrFK8 • <u>Video Link #2</u> (included in Google Slides): Open a Refrigerator RGM (1:22) https://www.youtube.com/watch?v=wp2EY2wifn8 • <u>Video Link #3</u> (included in Google Slides): Sonic the Hedgehog RGM (1:09) https://www.youtube.com/watch?v=0ljRRgeQ6tw • <u>Video Link #4</u> (included in Google Slides): Who Was Rube Goldberg? (1:18) https://www.youtube.com/watch?v=-FKQEIPRVGI • Lunch Tray Labyrinth worksheet • RGM External Resource Guide (optional) • Pens/pencils 	<ul style="list-style-type: none"> • Set up Google Slides: Lesson 1 • Test internet and video links • Print Lunch Tray Labyrinth worksheet • Print RGM External Resource Guide (optional) • (Optional) - Set up MouseTrap Board Game (made by Hasbro and can be purchased at stores such as Kohl's, Target, or Amazon) 	<p>Warm-Up: Rube Goldberg Machine Videos (5 - 25 minutes - depending if students wish to view more machine examples via the video playlist): https://tinyurl.com/yju4ec95</p> <p>(Optional Warm-Up): MouseTrap Board Game (5 -15 minutes)</p> <p>Instruction: Who Was Rube Goldberg (5 - 10 minutes)</p> <p>Activity: Lunch Tray Labyrinth worksheet (15 minutes)</p> <p>Closure: (5 minutes)</p>

GETTING YOUR STUDENTS READY

Objective: Students will be able to understand the concept of a Rube Goldberg Machine and how it uses a complex approach to complete a simple task. Students will be able to create their own complex model to complete an ordinary task to apply their knowledge.

CONTENT

Warm Up:
RGM Videos
(5 - 25
minutes)

Start by asking students if anyone has ever played the board game MouseTrap - a game in which players try to capture an opponents' mouse using the game's overly-complicated contraption the players must build during the game.

Note to Teacher: *If desired, you may choose to play MouseTrap with your students. If you do not play the game, continue the lesson and share the videos below.*

Share Video #1: Share the **Disney XD commercial** which features fast paced, exciting Rube Goldberg Machine elements. Highlight to students the everyday objects used to create the machine (alarm clock, skateboard, bicycle, drum, etc.). Rewatch as necessary since the video is only 15 seconds in length. (Video included in Google Slides: Lesson 1)

Link: The Disney XD Rube Goldberg Machine (0:15)
<https://www.youtube.com/watch?v=eXD5FFwrFK8>

Share Video #2: Share the **Open Your Refrigerator RGM** video which features a Rube Goldberg Machine built in a home garage, with the task of opening the refrigerator door. Highlight to students the everyday objects used to create the machine (garage door, file cabinet, paint can, hammer, etc).

Note: this RGM was built to display ALL x6 simple machines with the run. Teachers may refer back to this video during the Lesson 2: Simple Machines lesson plan. (Video is included in Google Slides: Lesson 1)

Link: This Mind Blowing Rube Goldberg Machine Will Open Your Refrigerator (1:22)
<https://www.youtube.com/watch?v=wp2EY2wifn8>

Share Video #3: Share the **Sonic the Hedgehog RGM** which features an animated Rube Goldberg machine likely seen by many students in theaters. Highlight to students the everyday objects used to create the machine (mushrooms, stones, sticks, etc.) Highlight to students the absurdity of the contraption. (Video included in Google Slides: Lesson 1)

Link: Sonic the Hedgehog RGM (1:09)
<https://www.youtube.com/watch?v=0ljRRgeQ6tw>

Ask students if they have ever tried solving a simple task in a more complicated than necessary manner. Ask for examples (such as climbing out of the way back of the car rather than using the regular passenger door, eating peas using a knife, or trying to turn off their bedroom lights without having to leave the bed to do so.)

Talk about this approach to problem solving. Ask students to think about the need for simplicity when creating inventions and solving problems, and the pitfalls of complexity.

Distribute the RGM External Resource Guide to students. (Optional)

Highlight to students they can view additional RGMs via the QR at home for further research and to fuel brainstorming.

<p>Instruction- Who Was Rube Goldberg? (5 - 10 minutes)</p>	<p>Share Video: Share the Modern Marvels video describing Who Was Rube Goldberg. (Video is included in Google Slides: Lesson 1) Video Link: https://www.youtube.com/watch?v=-FKQEIPRVGI</p> <p>Review Rube Goldberg’s biography below: Reuben Lucius Goldberg (Rube Goldberg) was born in San Francisco in 1883. His father, a practical man, insisted he go to college to become an engineer. After graduating from the University of California, Rube did a short stay with the City of San Francisco Water and Sewers Department. He continued drawing and soon got a job as a sports cartoonist for a San Francisco newspaper. An outstanding success, he soon moved to New York, drawing daily cartoons for the <i>Evening Mail</i>.</p> <p>Through his inventions, Rube Goldberg discovered harder ways to achieve easy results. His cartoons compressed time and were, as he said, “<i>symbols of man’s capacity for exerting maximum effort to accomplish minimal results</i>”. Rube believed that there are two ways to do things, the simple way and the hard way, and that a surprisingly large number of people preferred doing things the hard way.</p> <p>Rube Goldberg’s work will endure because he gave priority to simple human needs and treasured basic human values. He was sometimes skeptical about advanced technology and big science. While most machines work to make difficult tasks simple, his inventions made simple tasks amazingly complex. Dozens of arms, wheels, gears, handles, cups, and rods were put in motion by balls, canary cages, pails, boots, bathtubs, and paddles.</p> <p>Goldberg’s drawings of absurdly-connected machines accomplishing a simple task in an extremely roundabout way, has meant that his name, Rube Goldberg, has become associated with any convoluted solution to perform a simple task.</p>
<p>Activity: Lunch Tray Labyrinth (15 minutes)</p>	<p>Complete a “Lunch Tray Labyrinth” in small groups or individually. Distribute the Lunch Tray Labyrinth worksheet to students. Ask students to think of the most complicated way to get the cafeteria tray from Box 1 into the cafeteria window in Box 6. Students may draw an action picture of each device or gadget that moves the tray toward the window without leaving the lunch table. Describe the action on the lines under each box. This is a chance for students to be creative without limitation. Encourage students that any idea, even the most absurd, could be connected together (with additional items) to eventually solve the task.</p> <p>Following the activity, have students share with the class.</p>
<p>CLOSURE <i>(Check for Understanding)</i></p>	
<p>Closure: (5 minutes) In a Think-Pair-Share, ask students to think of another Rube Goldberg - style machine that they have observed before. They can share where they saw it and how it worked (children museum exhibits are a common answer).</p>	