

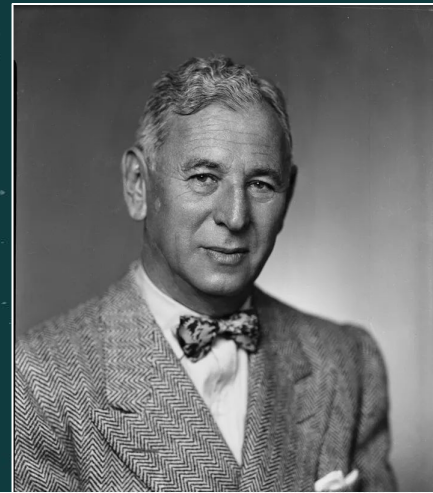
RUBE GOLDBERG MACHINE

A **machine** intentionally designed to perform a simple task in an indirect and overly complicated way.

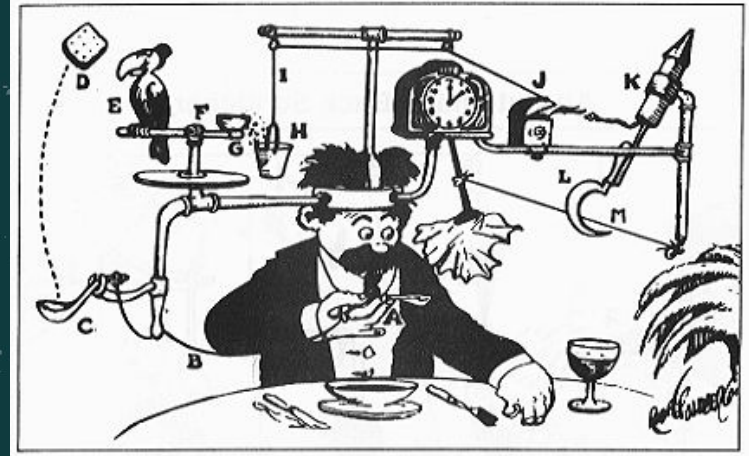
BACKGROUND INFORMATION

Reuben Garrett Lucius Goldberg (July 4, 1883 – December 7, 1970), known best as **Rube Goldberg**, was an American cartoonist, sculptor, author, engineer, and inventor.

Goldberg is best known for his popular cartoons depicting complicated gadgets performing simple tasks in indirect, convoluted ways. The cartoons led to the expression "Rube Goldberg machines" to describe similar gadgets and processes. Goldberg received many honors in his lifetime, including a Pulitzer Prize for political cartooning in 1948 and the Banshees' Silver Lady Award in 1959.^[1] He was a founding member and first president of the National Cartoonists Society^[2] and the namesake of the Reuben Award, which the organization awards to its Cartoonist of the Year. He is the inspiration for international competitions known as Rube Goldberg Machine Contests which challenge participants to create a complicated machine to perform a simple task.



Self-Operating Napkin



Watch these videos for inspiration!!

- ★ [Pass the Salt Social Distancing Style](#)
- ★ [Lemonade Machine](#)
- ★ [OK GO! This Too Shall Pass](#)
- ★ [Simple Dog Feeder](#)
- ★ [It may not work the first time](#)

Steps of the Engineering Design Process

01 ASK
What is the problem?

02 RESEARCH
What do you already know about this topic?
Research to learn more.

03 IMAGINE
What are some possible solutions to this problem?

04 PLAN
Create a plan.
Draw diagrams, make lists, etc...

05 CREATE
Put your plan into action!
Start by making a prototype.

06 IMPROVE
What things worked?
What didn't work?
How can you revise your plan?

07 PRESENT
How will you share your learning?

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STEP 1: ASK!

How do you complete a simple task in a not so simple way?

Create a Rube Goldberg Machine of course!

You can choose any simple task you would like and create a Rube Goldberg machine to make that task happen.

Here are some ideas of simple tasks to get you started thinking:

- Ring a Bell
- Pop a Balloon
- Open a Door
- Shut a window or door
- Pour a bowl of cereal
- Turn something on or off



What task are you going to be completing?

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Firecrackers, dangerous chemicals, and other unsafe items are **NOT** permitted!

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****Make sure your parents okay all of the items that you plan to use.****

STEP 2: RESEARCH!

Search your house for things that you can use to make your machine. I have created some lists of possible items. **Delete** items that you don't have and **add** any items that you do have that you think would be helpful.

Things that Roll

- Marbles
- Balls
- Toy Cars
- Dominoes
- Skateboard
- Roller Skate

Ramps

- Toy Train Tracks
- Marble Runs
- Books
- Trays
- PVC pipe
- Plastic tubing
- Gutters

Things that Move

- Mousetrap
- Dominoes
- Toaster
- Fan

Recyclables

- Cardboard
- Cereal Boxes
- Cardboard Rolls
- Plastic Water Bottles
- Cans
- Aluminum Foil

Household Materials

- Chopsticks
- Popsicle Sticks
- Vinegar and Baking Soda
- Wooden Blocks
- Bowl
- String
- Tape
- Sand
- Magnets
- Hammer
- Balloons
- Water
- Fan
- Ruler

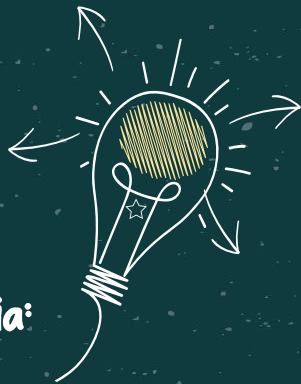
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STEP 3: IMAGINE!

Think of ways to solve the task that you have chosen using the following Criteria:

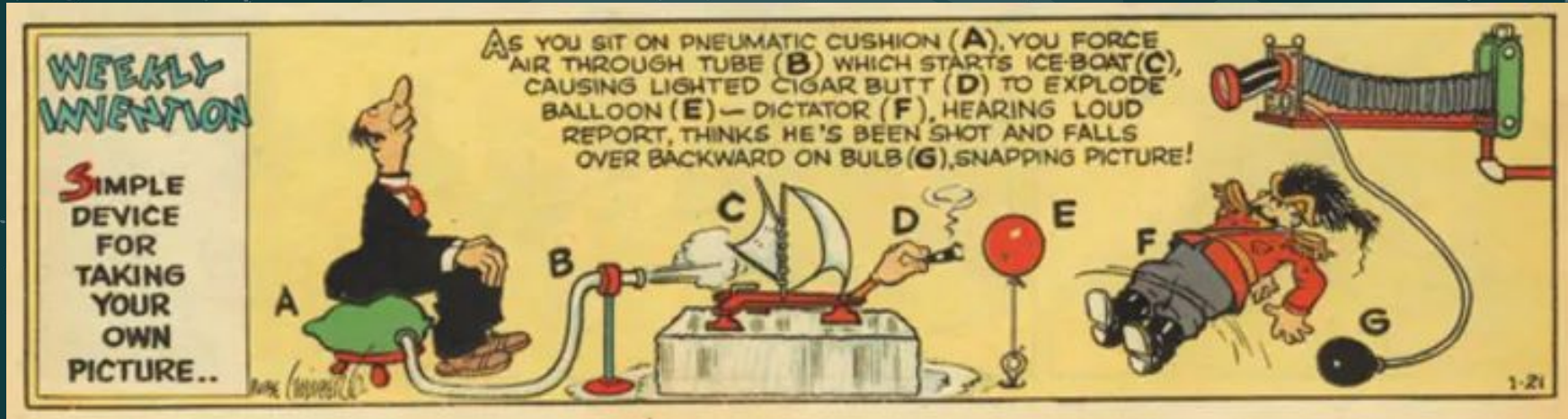
Project Criteria

- Your project must have at least FOUR WORKING STEPS. Each step is defined as the use of a new machine.
 - EXAMPLES OF STEPS: A) Ball rolls down a ramp and causes a mousetrap to snap. B) The mousetrap pulls a string causing a scissors to close. C) The scissors cut a cord causing a weight to drop...
- The machine must work by chain reactions. One action starts the machine and you may NOT touch it after it starts.
- NO use of commercially designed RB materials (such as the game mousetrap).
- You must submit a video of your final machine working. If this is not possible, you must submit a detailed drawing and description of how your machine works.



PRO TIP!!

BEGIN WITH THE END IN MIND... In other words, WORK BACKWARDS



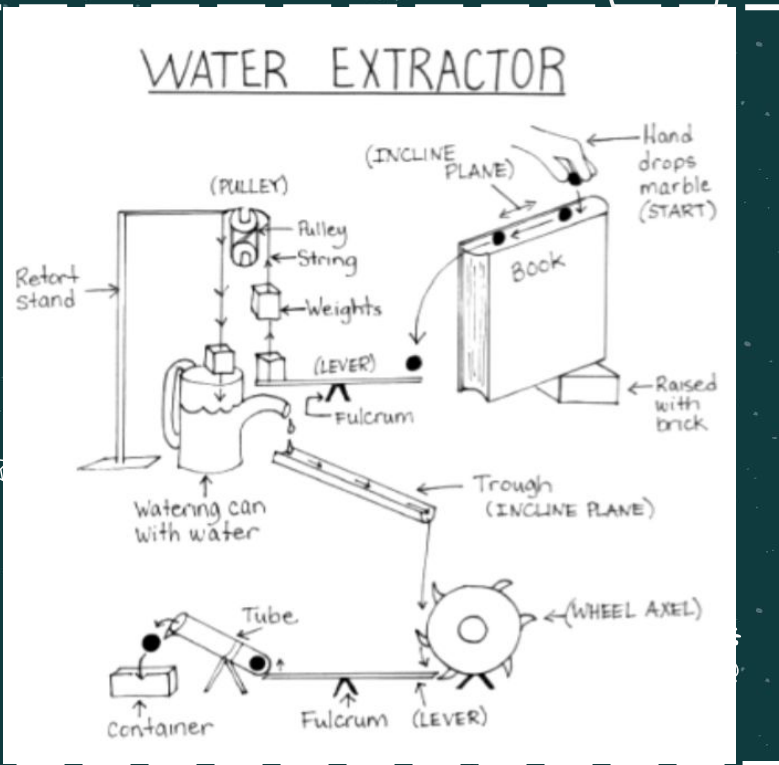
Use the above picture as an example. Think about the following questions:

1. How are you going to get the balloon to pop?
2. How are you going to get the thing that pops the balloon to move? (Or the balloon to move to the thing that pops it?)
3. How are you going to get that thing to get that thing moving to pop the balloon?

STEP 4: PLAN!

Make a blueprint of your machine before you start. If you can, hold it up at the beginning of your video.

- List the 7 steps in your drawing.
- Label the items that you are using.
- See the example to the right ---->



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STEP 5: CREATE!

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Bring your plan to life!



- ★ Make sure you clear everything with your parent/guardian before you start to build!
- ★ Your machine must work smoothly from start to finish. Keep testing to ensure that this will happen on your final attempt.

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STEP 6: IMPROVE!

Identify 3 things that you had to improve in order to make your design successful and explain what you had to do to fix it. **These do not need to be turned in, but it is great to think about it.

1.

2.

3.



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STEP 7: PRESENT!

Please submit a video of your Rube Goldberg machine in action. Show your blueprint if possible. In the video or in a separate email, answer the three questions on this slide.

Video Options

- Upload to Google Drive and share it with me
(petersons@benjaminlogan.org)
- Email the video to me directly
- Upload to YouTube and insert the video or link here.

1. Describe **THREE** forces used in your machine. (how did you get an object to move)
2. Describe/Explain one step in your machine where the forces were **UNBALANCED**?
3. Was there any point where the forces were **balanced**?