Who was Rube Goldberg?

Rube Goldberg was an American cartoonist and artist. Mr. Goldberg was known for his wacky drawings of elaborate contraptions that complete simple tasks. Rube was an engineer by trade and used his knowledge of science and working parts to draw these chain reactions.
Rube's drawings often comprised pulleys, inclined planes, levers and other simple machines.
According to RubeGoldberg.com Rube Goldberg's machines are so infamous that you can find him in the dictionary.

What is a Rube Goldberg Machine?

A Rube Goldberg Machine is a series of chain reactions that make a simple task difficult and humorous. If you ever watched PeeWee's big adventure, PeeWee's breakfast machine is a great example of a Rube Goldberg machine.

How to Build a Rube Goldberg Machine

Step 1: Get Kids Excited about Rube Goldberg Machines

Get kids excited about Rube Goldberg Machines. Before you present this activity to the kids, create your own simple Rube Goldberg machine to show as an example. This does not have to be overly complicated or have too many steps, but it should have at least 4 steps, and accomplish a task. Keep reading, below are some ideas and tips to get you started.
After you have built your machine and you have the kids gathered for the activity ask them what a chain reaction is. Depending on the age of the children you are working with they will likely understand that a chain reaction is when one action leads to another action. Explain that they will be making a chain reaction machine to accomplish a task, this machine is called a Rube Goldberg Machine.
Demonstrate by showing the kids the machine you built. Barring everything going as planned, kids will be more than excited to build their own machines.
Don't have time to build your own machine? There are so many videos available on youtube that feature some amazing Rube Goldberg Machines. This one from OK Go Kids! is a short and effective video on Rube Goldberg machines for kids.

Step 2: Decide what your machine will do

Rube Goldberg Machines usually solve a problem, but sometimes they are just fun. Decide on what your machine will do. Here are few ideas get you thinking:

- Ring A Bell
- Turn on a Light

- Shut a Door
- Feed the Dog
- Turn on the TV
- Pop a balloon
- Blow out a candle
- Stop an alarm clock

Step 3: Gather Supplies

Gather together any supplies you can think of. You want to look for things you can use as ramps, things that roll and things that move. If you are conducting this activity within an after school program or a classroom you may find a manipulative area full of building supplies, this is the best. Here are a few examples of simple things kids can use to make building their Rube Goldberg Machine easy.

Things that Roll

- Golf ball
- Marbles
- Matchbox cars
- Roller Skate
- Skateboard

Things to Use as a Ramp

- Cardboard Blocks
- Pool noodles
- Books
- Funnel
- Marble run

Things for Building

- Aluminum foil
- Paper cup
- Plastic cups
- Wax paper
- Water bottle
- Cereal box
- Cotton balls
- Spoons
- Plastic forks
- Q tips
- Spoon

Things that Move

- Fan
- Dominoes
- Mouse Trap
- Toilet paper (being unrolled)

Things that Secure

- String
- Ribbon
- Tape
- Rubber bands

Once you have your supplies gathered put them out so everyone can see what supplies are available to them. Ask kids to think about how they can use each object to create a chain reaction.

Step 4: Build your Machine

Once you have all of your supplies together start by brainstorming some chain reactions then practice some trial and error sequences. Could domino set off a mouse trap? Can a rolling ball move a matchbox car? The possibilities are endless!

These photos pictured above are from a challenge I did with kids. The challenge was to create a basic Rube Goldberg Machine that will ring a bell. The machine had to have at least four steps. As you can see, a lot of kids used dominoes, matchbox cars, and recycled materials to build their machines.

Tip # 1: Work Backwards

Once kids have a few ideas and have put together a few successful reactions have them start at the end. Start with the task you want to accomplish. In my example above I have kids start by simply creating a way to ring the bell.
Some kids had a marble roll into the bell, or dominoes fall into it. Next I ask them to think about how they will make the marble or dominoes move. As they came up with ideas, I asked them to try it. Then I followed up the trial with a few critical thinking questions like:

- Did it work?
- Will it work every time?
- Are their variables that will effect how well it worked?

After that kids were able to add another step and so on until they had a machines that was at least four steps and could ring a bell. Kids will be psyched to show you their design along the way. This give you an easy opportunity to direct them through the critical thinking aspect of building a basic Rube Goldberg Machine.

Tip #2: Don’t be afraid to Let Kids Fail

Don’t be afraid to let kids fail. Failure is an important part of this activity. Kids will not be successful the first time they try, maybe not even the tenth time, but eventually they will have some success and that success will be powerful.

There is nothing as rewarding for a leader, teacher, or parent than to see the look of pride on the face of a child who is truly proud of themselves for the work they have done. Just remind the kids that they have not failed until they have given up, success comes only to those who keep trying.