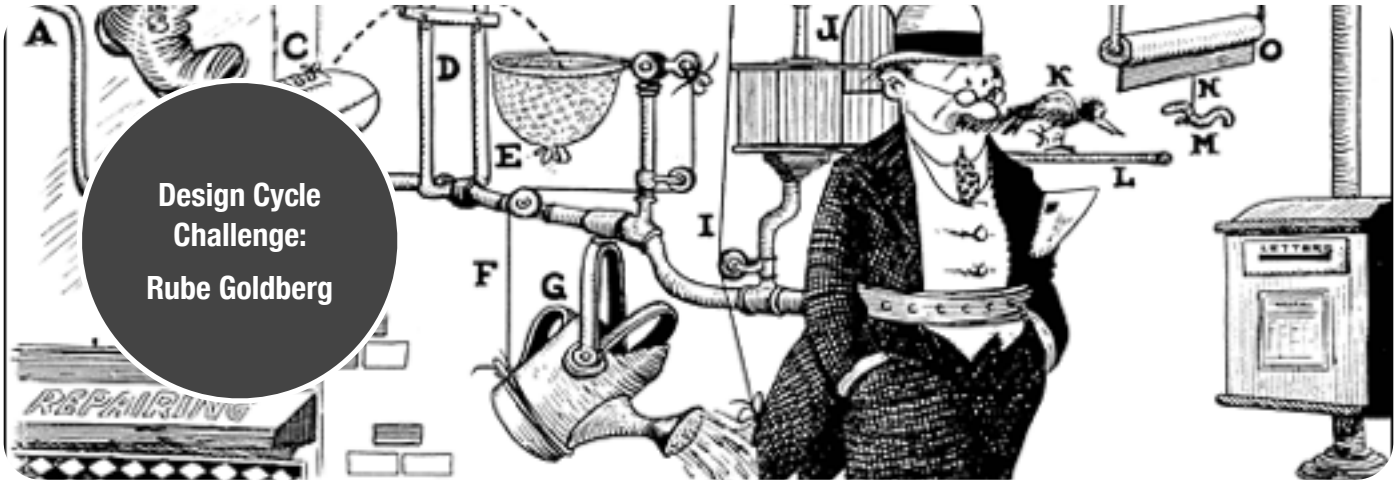
November 15th 2013

# DESIGN CYCLE CHALLENGE

## GROUP # 15

BY: JACKY, JESSICA, KK, PEER & PORSCHE

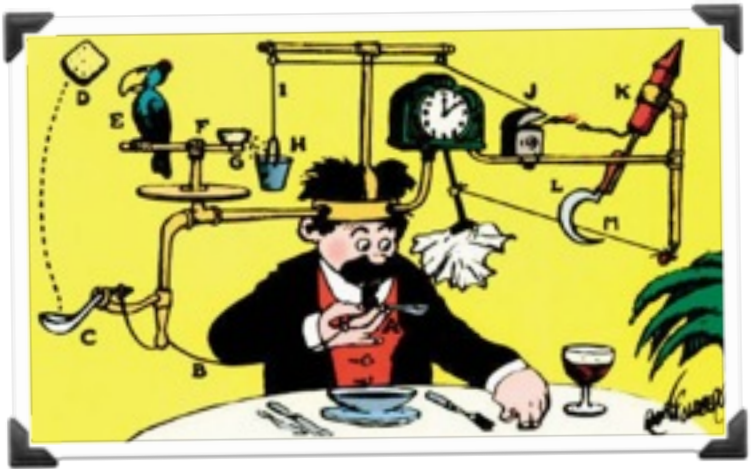



Design Cycle Challenge:

Rube Goldberg

## WHO IS RUBE GOLDBERG ?

Mr. Rube Goldberg born in July 4 in the year 1883 and died in December 7 in the year of 1970. Mr. Rube Goldberg create many design and invention which he think it will made his life full with comfort, each of Mr. Rube Goldberg invention will have uniqueness and complicated invention in each of his famous invention. Each of Mr. Rube Goldberg invention always include physics, science and accuracy which made his invention uniques.




November

# DESIGN BRIEF

Day #1 to Day #5 During The Design Cycle Challenge Week

Our team process is to get a perfect working Rube Goldberg Machine using strings, marbles, ping pong ball (maybe), books and futureboard.

Our plan is to succeed in making a machine which properly works and connects to each other. We made plans and and many drawing, taking many pictures to help understand how the physics of the Rube Goldberg machine.

Our other aim is to use up as much space of the box we have been given to maximize the amount of actions in our machine.

# RESEARCHING

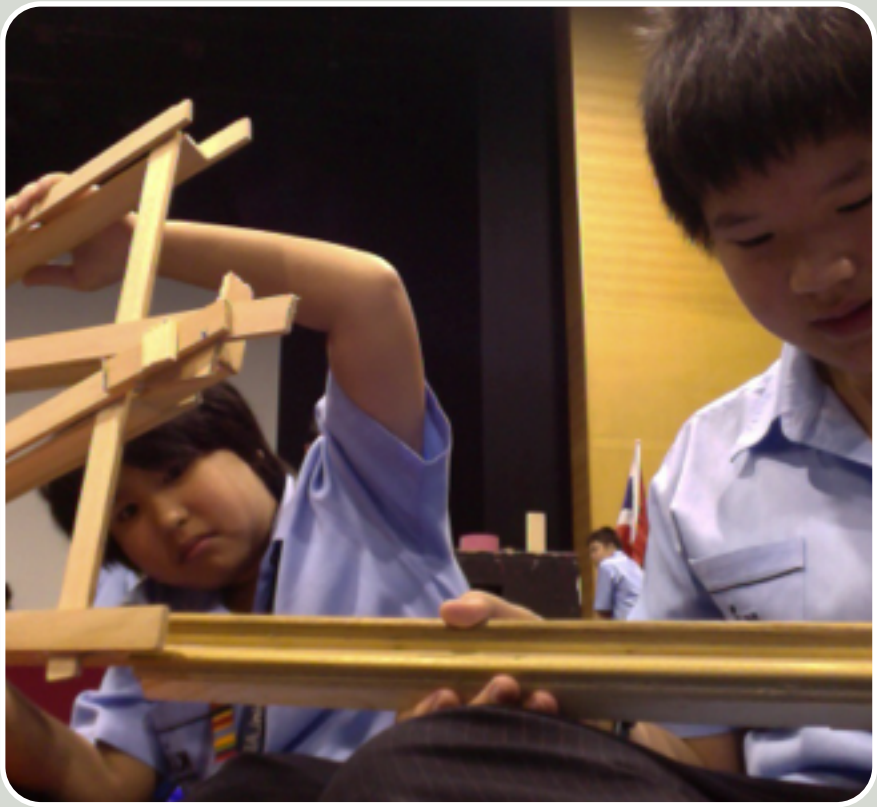
## Rube Goldberg

Reuben Garrett Lucius Goldberg born in July 4, 1883 in San Francisco California. Rube Goldberg was one of the people who which to never gave up on anything he were doing. His goal is to achieve the objective he was doing and never gave up on what he was doing.

## Who is Rube Goldberg?

Reuben Garrett Lucius Goldberg born in July 4, 1883 in San Francisco California. Rube Goldberg was one of the people who which to never gave up on anything he were doing. His goal is to achieve the objective he was doing and never gave up on what he was doing. Mr. Rube Goldberg have created many great design and invention through out the history, Mr. Rube Goldberg have created many famous machine which is complicated and were full with physics and science. Most of Rube Goldberg machine were inspired by other object around himself which he believe that his invention will make people life even better than before when we put physic and science into the invention.

The Rube Goldberg machine is a sort of machine which is deemed as “overdone” or complex. What it is supposed to do is to make a very simple action a very complex one, like some sort of chain reaction like getting the ping pong vll across the room with many actions and complex steps. This machine is very famous in people and is a very fun thing to do as it is used in many competitions and to make many world records.



# THREE DESIGN

### First Design

So for our first design, we had planned to start off the machine with a car on top of a stack of books, stacked like stairs. The car would push the ping pong ball down the book stairs, and then hit the dominos and the the dominos would fall in a spiral sort of shape, and lastly hit a see saw kind of thing, which would act like a catapult and make the ping pong ball on the other side fly off into a small hole. The problem with this design was that it was very hard to get the catapult to successfully get the ping pong ball into the hole, and also that sometimes the force of the domino would be weak, thus making the catapults power much more less effective.

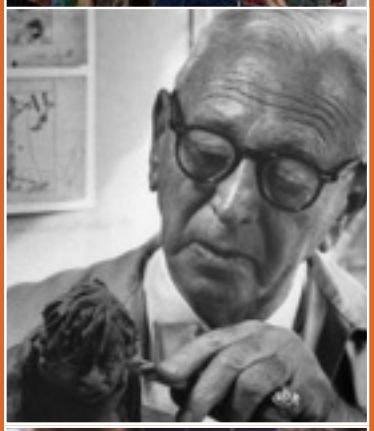
The reason we chose this was because it was quite complexed compared to the other two designs and this also had potential energy and different actions, which led to us making a proper, successful Goldberg machine. This machine/ design also works very well, as out of 20 tries we did, it worked around 15 times.

### Second Design

Our second design had been designed to start with dominoes, which then went up a stair-like arrangement of books, which then triggered a marble to fall down a slope, which then triggered another set of dominoes, which pushed a car to then push lastly, another final set of dominoes, connecting to the next group. The reason this was not going to work is because it was very basic and didn't have potential energy, and the actions were pretty much the same (dominoes falling) but just different things triggering it each time.

### Third Design (The One We Choose)

The third design is the one we chose. So it starts with dominoes falling and went up a stair-like arrangement of books which then triggered the final domino, which had a thumbtack stuck on the surface, to hit the big marble into the cup. The cup was attached to a string, and the string to a pulley, which was place on top of a piece of wood. The big marble falling into the cup triggered the other side of the pulley, which is the cup with the small marble, to rise up, letting the small marble fall down, and then it fell onto a ramp sort of thing, which made it fall left to right to left, which lastly led the small marble to the slope which led the marble to hit a small set of dominos, and then the dominos hit the ping pong ball, which hit another small set of dominos to end the machine.



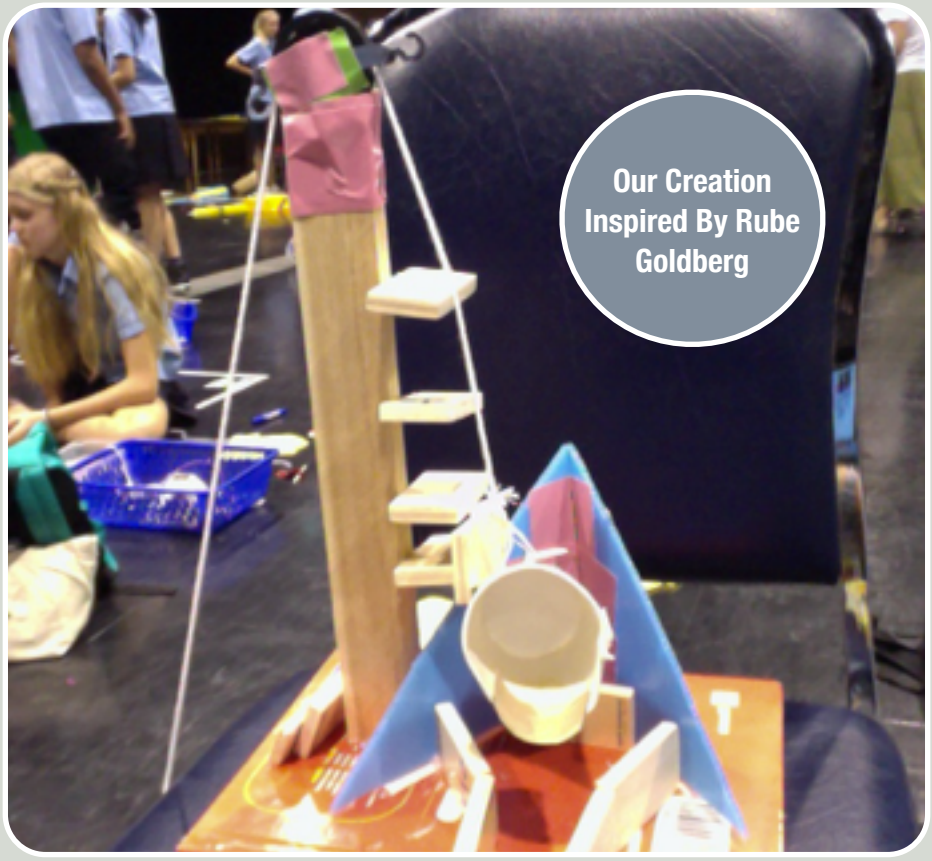
# FINAL DESIGN CHOICE

**How It Work?**

The third design is the one we chose. So it starts with dominoes falling and went up a stair-like arrangement of books which then triggered the final domino, which had a thumbtack stuck on the surface, to hit the big marble into the cup. The cup was attached to a string, and the string

**Material That Were Used?**

- Domino
- Books (Theme)
- Water Cup
- String
- Pulley
- Wood
- Future Board
- Duck Tape
- Glue
- Glue Gun
- PVC Pipe
- Ping-Pong Ball
- Marble




## PICTURE GALLERY

# DESIGN SPECIFICATION



1. We will gather all information about the creator of the machine Rube Goldberg.

2. We gonna shared and brainstorm out our ideas on what we gonna do for the design cycle challenge project.

3. We will came up with three design and we need to make our own decision on what is the best design for the Rube Goldberg project.

4. Then we make some change on the design according to other people perspective and what they think about the design.

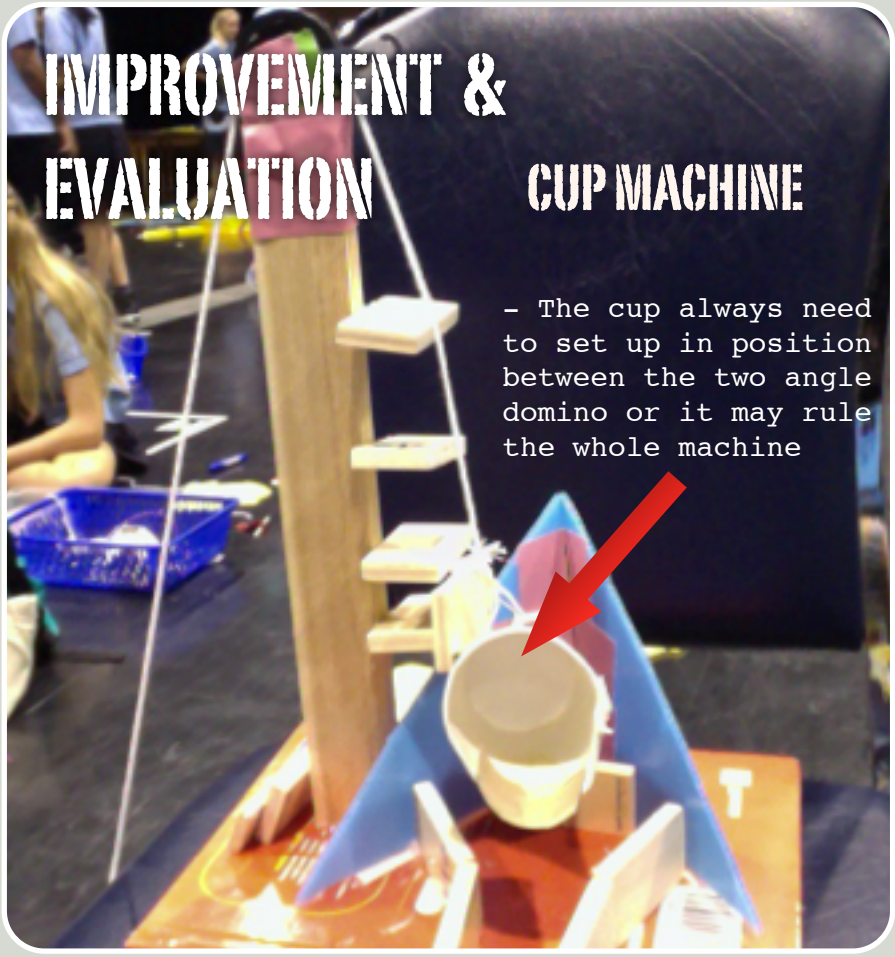
5. Next we will gather all of the material that we will need for the design cycle challenge project.

6. Then we will start to craft out our ideas and put it into action by using our design plan and the material that we gather.

7. After finishing our machine we will find some errors and problem that we need to fix on the machine.

8. After we have finish fixing the machine we will do approximately 3 to 5 trial to make sure that the machine is accurate and ready to test out.

9. We will also record our plan and ideas in a note book to keep track of our movement and development as a group.




**Errors That Were Happening:**

- Not Accurate on some part of the machine.

- Wisely used of domino in the machine.

**Things That Went Really Well:**

- Creativity and collaboration that went very well in our group.

- Good accuracy for some part of the machine.

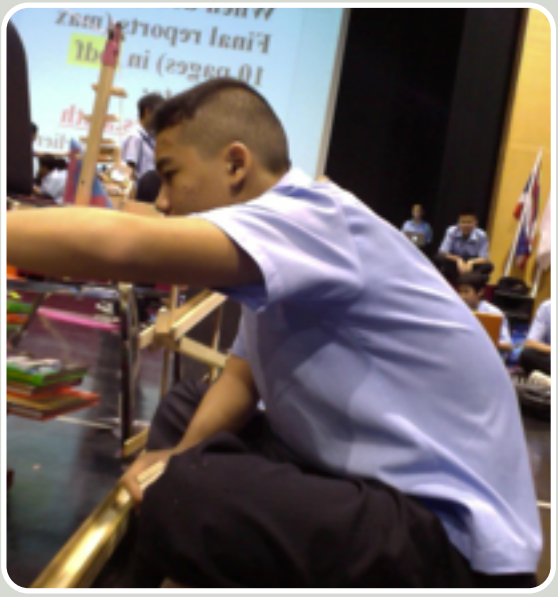

- Need to be accurate piece of wood, so the ball could travel even smoother and faster, with less errors that gonna happen in each trial

- For this normal looking wood is one of the most importance part of the machine if we don't have this wooden part it may made the marble travel in different direction.


| PAST OR FAIL :D :( | | NORMAL WOOD | CUP MACHINE | ZIG-ZAG WOOD |
|---|---|---|---|---|
|  | -Past | ✓ | | |
| | -Sometime | | ✓ | ✓ |
| | -Fail | | | |

# PICTURE GALLERY


STACKING UP THE DOMINO



THE TEAM LEADER FIXING UP THE PROBLEM

OUR FINAL MACHINE

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