

TEAM 23- “Dominoes On A Cliff”

Design Cycle Challenge: Building a Rube Goldberg Machine

Members- Geo G6, Sial G6, Mami G8, Rajat G9, Harry G10
Report

Inquiry and Analyzing

The teams process and communications in this group during this DCC week has been working fine as everybody in the group knows each other and can work together well. Even though for the past few days we have been two people short, and it helps for the 3 members in the group communicate and focus more on the work. We all are focused and know what we have to do day by day in this design cycle challenge week.

Rube Goldberg machines is a contraption or an invention that performs a chain reaction which leads to other things falling down, these machines usually has a lot of both kinetic and potential energy used to make it successful. Kinetic energy is energy that is still moving such as moving cars, river flowing, or people running where Potential energy is energy that is stored and about to trigger or go such as water trapped behind a dam, air and pressure in a soda bottle or a compressed spring. Although there is still a history behind this contraption. “Rueben Lucius Goldberg” who was a cartoonist and he was drawing and sketching for many years where he then studied and had a job about sewer pipes in 1904. Later on seeing that his drawings were looking like technology he then transferred that to a machine which performed different and unique things. The machine is now named after him which is the Rube Goldberg Machine. (bio. True Story).

Nowadays there are other sorts of media which makes the machine much more entertaining such as “Trap Happy Porky” where it is a cartoon showing a cat trying and using different and unique techniques to capture the mouse, or “Betty Boop and Grampy” during 1935 where it showed a cartoon character trying to use different machines and materials to play music. (Rube Goldberg Machine.) There are all sorts of media that can consists of rube Goldberg machine and can use ideas from that, which may be for entertainment or for other reasons. Artists such as *Tim Hawkinson, Peter Fischli* and *David Weiss* were also inspired by this. Rube Goldberg machine is not just a simple type of machine, it also shows different types of energy and has a lot of motion and effects included in it to move on and trigger something else which then triggers to a different energy or motion.

Design Specifications

1. As a group, by the end of this week we will create at least 3 proper and presentable designs. These designs will start from easy, harder then challenging.
2. For three days on Tuesday, Wednesday and Thursday, in the last 15 minutes of 7th period we will film our process journal and submit it before 9 PM.
3. On Tuesday, we will plan our first design for the Rube Goldberg machine for 2 periods.
4. On wednesday we will then create our second design for 2 periods
5. We will make our machine stable and have all parts working for around 2-3 periods to prepare to the consistency test on Thursday.
6. We will then work on Thursday and create the design for the whole 5 periods given to make it good for Friday test. (Period 3,4,5,6,7)

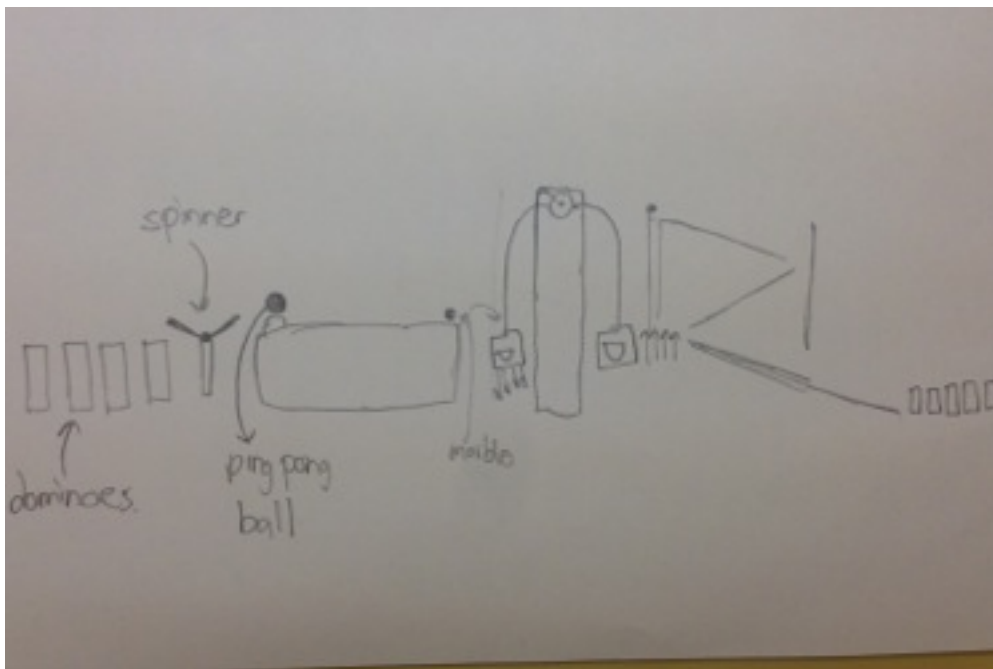
Test Statements

1. We will draw 3 different designs and then try creating it and include evidence in our daily process journal videos.
2. We will film each group member and talk about the designs, inspiration, how it connects to the image that we've been given, what are some improvements or changes made and what were the highlights of the machine. We will edit the video each day and submit it in <http://kitwiz.ict.kis.ac.th/kvdo/>
- 3/4- We will draw and layout each design for each day and complete it in 2 periods which is around 1 hour and 40 minutes.
5. On wednesday, we will work and make our machine stable and make sure it works throughout the whole way and prepare for the consistency test where we have to test 5 times and see how many times our machine was successful.
6. We will add and finish off our third design and add any finishing touches and pieces that are needed to complete the machine. We will add any objects or natural items that will make our machine connected to the topic. We will also use the middle periods to paint our dominoes.

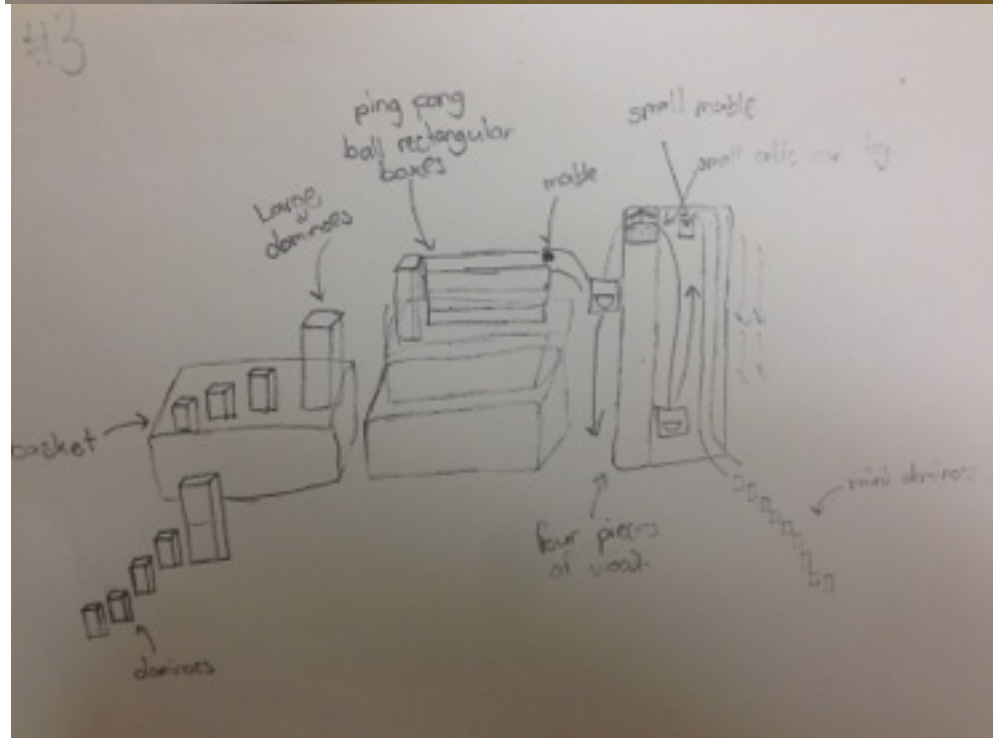
Work Cited

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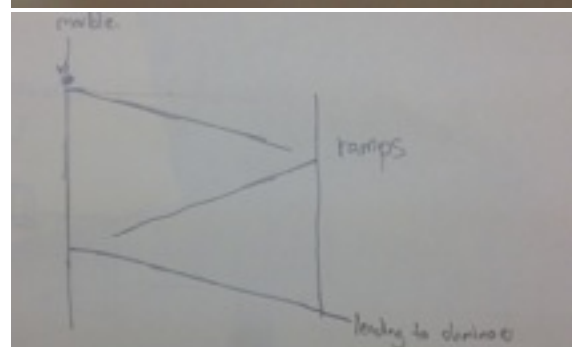
Developing Ideas 3 DESIGNS-



The **first** design shows how it starts from the dominoes then it leads to a spinner which then spins towards the ping pong ball, which falls into a cup and then the weight makes it go down and it goes up for the opposite side, and the triggers the marble to come down the ramp which leads to the rest of the dominoes.



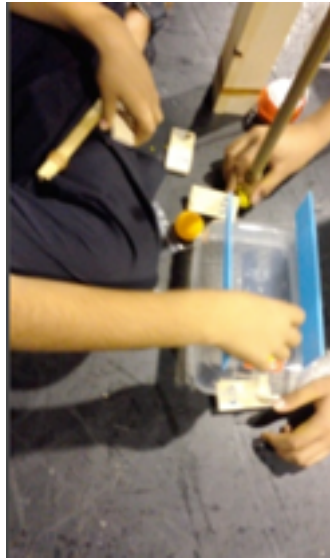
The **second** design then shows how we have increased the elevation so that the dominoes would go up and then lead to the weight pulley thing which then triggers the opposite side to push up and then hits the marble where it falls down into the tube and then triggers the rest of the mini dominoes.



The **last** design that we made was the ramps but we wanted to replace the ramps with the marble that went down the tube and then have a car which would trigger the dominoes.

Our **Final** decision of the designs to create for our machine was design #2. We chose this because it was a design that we were most confident with and the consistency of the machine each time we tested it worked really well. We also chose this because it was our only design that relates to our image. It showed how we used different materials and tools such as dominoes, mini dominoes, cups, thin strings, baskets, marbles, and cardboard. It had a lot of elevation and looked much more complex.

Creating the Solution



After testing our machine on Thursday and connecting it with other groups our actions and machine went through smoothly the second time around and it showed slight consistency after.

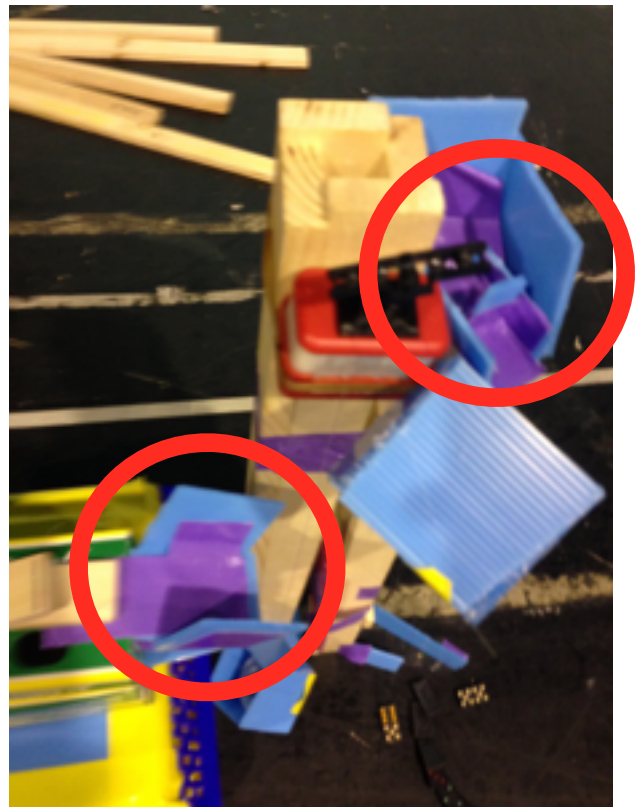
The machine that we created somehow relates to our theme because the image shows mountains, sea and different levels and elevations. We wanted to show from the sea level below and the mountains on top and that explains our machine being in that shape. The image shows that the level on the left is low and the the right in the mountainous areas are elevated. We have also painted our dominoes to show the theme of our machine also having small objects such as rock and small leaves or sticks to show the connection between our “Dominoes on A Cliff” Machine and the visual stimulus. The image shows that the mountains are very stable and there are put in place natural. We did it manually and we made our machine very stable to represent the strength of our machine also relating it to the image.



Evaluating

Our group has followed the design specifications because we made these to help achieve our own goals. We did and accomplished each tests and we could still work on any organization or time management slightly more. In the design specifications, where we talked about designs, we followed that and we had 3 different designs to work with and choose from in order to make our machine successful and also at the same time have it be related to the theme.

There are tons of changes that we made during the process of our machine this week. What we did was we actually tried out 3 of the designs and chose the 2nd design as we were confident with it and that it could work best. First we used wood and stacked them up to make a higher piece of wood for the dominoes to go up and it proved to be very hard and it didn't work so we got baskets and stacked them up which was much easier for dominoes to hold their balance. We made changes to every part of our machine for the second design such as adding small cardboards where ever is needed. (There are red circles to show the two changes we improved and added) Two examples



are from the part where the marble falls into the cup and pressures it to go down, we had to make cardboard to make the box be stable and in place for the marble to fall at the exact point. When the opposite side of the wight lifting part, it then triggers the marble ball, and that was where we added cardboard so that we are clear and 100% that the box will go up and hit the cardboard. We added tape in places that were weak such as where we had to connect large pieces of wood together. We also taped some of the dominoes together to create large dominoes so it could knock down the other dominos that are higher.

How the machine could be improved is in length and duration. What we did was we actually were playing safe and we wanted a Rube Goldberg machine that was workable and presentable and also shows different techniques using different types of materials to make it look sophisticated. We had different elevations and I think that was a major strength in our machine. I think that our machine could have other things included with it as well such as the ramp that we created but it turned out that it didn't work and it wasn't right. The last thing that could've been done to make this machine much better was to use the whole space that we have so it actually is fun to watch and a lot of things going on at the same time which would have been entertaining as well. Overall we are all satisfied and we all tried what we could do to make this machine, and it was our first time as well. This week was a very challenging one compared to all the other years as there are more steps and more processes needed to accomplish the problem!

The problem-

“Create a Rube Goldberg machine that contains 3 actions, 2 potential energy sources, incorporates the assigned stimulus and also demonstrates your collaboration and creativity.” (<http://kisdcc2013.weebly.com/report--video-journal-requirements.html>)

Link to the three process journals-

Tuesday- http://kitwiz.ict.kis.ac.th/kvdo//watch_video.php?v=DSA619ADKRSS

Wednesday- http://kitwiz.ict.kis.ac.th/kvdo//watch_video.php?v=G9WAXKHY1M99

Thursday- http://kitwiz.ict.kis.ac.th/kvdo//watch_video.php?v=AAB2U9DO4UH1

(some group members were absent in the videos, some files were accidentally deleted)