

Group 4: Amusement Park (Small)

1. Objective

- To make the amusement park model look alive with electrical circuit and to apply our knowledge about electricity into the model.

2. Materials

Train

- card board
- can
- 2 small battery
- on/off switch
- conducting wire
- rubber
- ruler
- motor
- cutter
- wood stick
- straw

Carousel

- motor
- compass
- ruler
- paper
- glue
- animal model
- string
- conducting wire
- motor
- bottle lid
- pen lid
- glue gun
- styrofoam
- tape
- micro on/off switch
- battery base

Ferris

- popsicle stick
- glue
- cutter
- tape
- color
- pen
- rubber

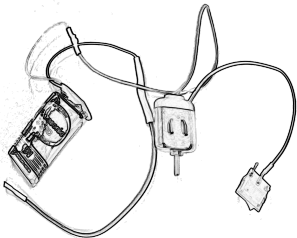
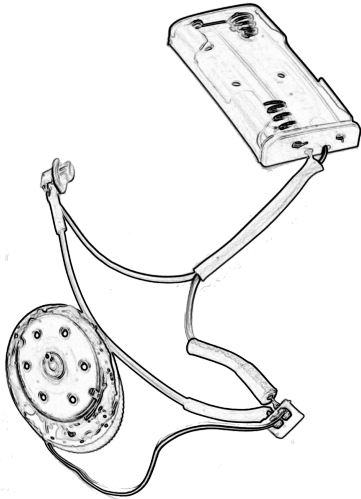
- motor
- conducting wire
- 2 small battery

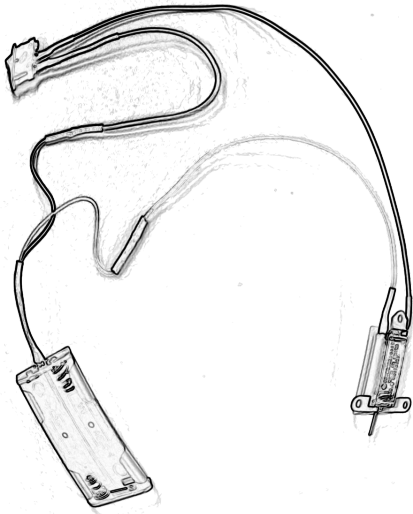
Park

- fake grass
- platform
- light bulb
- fake tree
- fake bench
-

3. Set-up (Drawing)

These are our 3 motors that we use in this project.





4. Background/ Introduction

In this project, there 3 electrical circuit that are involve our amusement park. All of them are series circuit. One for the train, one for the carousel and one for the ferris wheel. Moreover, we need to create model to fit perfectly with the circuit.

5. Discussion of the physics Concepts

- a.) Measurement - we use this concept to measure material to create a model.
- b.) Electric current - to be able to make our amusement park look alive we will need a help from this concept. The motor in the circuit need the flow of charge to make it spin.
- c.) Newton's first law - An object at rest stays at rest and an object that moving continue moving in the same speed and in the same direction unless external net force acted upon, so the train will continue moving in the same direction, if no external force.
- d.) Newton's second - law acceleration is directly proportional to force, and inversely proportional to the mass of the object. If the train is lighter, it will move faster. Wheel will move slower if the mass increase.
- e.) Law of gravity - The law of gravity is use to pull all of the material in the surface.
- f.) circular motion - the carousel turns around the axis in the same amount of time
- wheel of the train also turn around the axis in the same amount of time.
- g.) Centripetal force - the Ferrise are moving toward the fixed center, so it will use Centripetal force.
- h.) Sources of energy - the battery make the Ferris, Carousel and train move.
- i.) center of gravity - Our Ferris legs are not equal, but it does not fell down because its center of gravity is still in its base.

6. Discussion of Design (Step by Step)

Train:

(Body)

1. cut the cardboard into 5 pieces. Cut into 7x8 for 4 pieces and 21x7 for 1 piece.
2. Stick it into train shape

(Wheel)

1. Make the wheel from the can lid. Cut out only lid part for 6 lids.
2. connect the wheels with the stick which cover by the straw.
3. Stick the wheel with the train

(Motor)

1. Stick the motor to the body part of the train
2. connect the conductor wire with the battery, the motor, and the switch
3. Use the rubber to connect the motor with the wheel to enable the train to move
4. Decorate the train

Carousel:

(Roof)

1. Cut the paper into circle shape, divided them into 6 section. Fold the edge of each section. Cut each section and glue stick the side of each part together. And it will become the roof part
2. Cut the paper into hexagon shape. Drill the center of the paper to create a hold
3. Stick the roof and the hexagon paper together

(Base)

1. Cut the styrofoam into circle shape
2. put the battery, which connect with motor and switch by conducting wire, under the Styrofoam
3. stick the bottom of the pen into the motor and cover the pen by the roof part
4. turn on switch and the Carousel will run.

Ferris:

(Wheel)

1. Cut a cardboard into a small circle.
2. Cut the popsicle stick into different size.
3. Stick popsicle stick on on the small cardboard circle.
4. Adjust the position of the stick and repeat the process 1-4 again to make the second wheel.
5. Paint both wheel.

(Supporting Base)

1. Cut the end of popsicle stick (4x)
2. Stick the bottom part the we cut together with glue/tape.
3. So now we have 2 long popsicle stick.
4. Then cut 3 popsicle stick into 3 different size (short, medium, long).
5. Stick those 3 popsicle stick on the big 2 popsicle stick to make it balance.
6. Then cut a small pieces of popsicle and stick it to strengthen it.
7. repeat 1-7 process to make another base.

(Pulley)

1. Cut a cardboard into 2 small circle.
2. Glue it together.
3. Put the rubber between it.

7. Data

Ferris:

(Wheel)

approximately 36 popsicles

(Supporting base)

approximately 30 popsicles

Carousel:

(Roof)

diameter of approximately 20 cm

Train:

(Body)

21x7 for the base

Wheel with circle shape and use 6 wheels to run the train

8. Analysis of Data

Ferris:

The reason why we use this amount of popsicles is because it is the best amount to make it balance and strong enough to stabilize on the supporting base and be able to move. If we use less than this the ferris might collapse while it is moving.

Carousel:

We choose to make it this big (20cm) because if the roof is too small then it will spin too fast. The weight of the roof is inversely proportional to the rate of spinning.

Train:

We made a wheel circle and smooth enough to cause less friction.

9. Conclusion

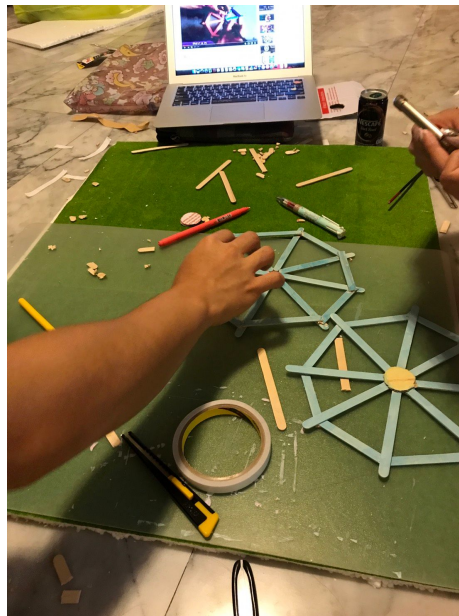
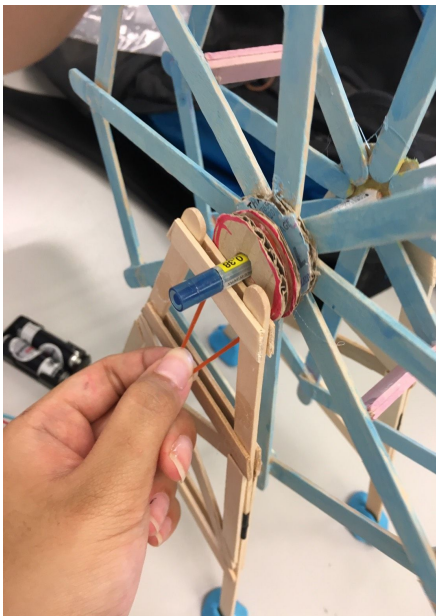
This project is about electricity, we use lots of knowledge from physics class, we use knowledge from almost every chapter to create this project such as a newton's second first law which from chapter 1, centripetal force and center of gravity. We tried to use as much theory as

we could in this project. We receive lots of knowledge from this project, and we also know that in our daily life, physic is all around us. We success in this project, every machine is work, because we put as much afford as we could in this project.

10. Recommendation

We did very well in this project, everything that we want to do is success. However, we think our project should start earlier, so we could do more machine and adjust some mistake.

11. Group Working



12. References

How to make a carousel amusement ride for kids by crazyartline. (2016, May 08). Retrieved May 18, 2017, from https://www.youtube.com/watch?v=5_79KBIKeKA&t=38s

Awesome Train DIY - Toy Powered Battery Train. (2017, March 07). Retrieved May 18, 2017, from <https://www.youtube.com/watch?v=M652axO-zmw>

How to make a ferris wheel at home. (2016, April 02). Retrieved May 18, 2017, from <https://www.youtube.com/watch?v=TiP5B0pNtOg&t>

How to make a electric ferris wheel at home. (2016, April 14). Retrieved May 18, 2017, from <https://www.youtube.com/watch?v=NO5VZuqMpU4>

LAB REPORT

Amusement Park



Group Members

Chanisara Wanna 5861015
Prai Wongrunpakorn 5861121
Phuripat Yimserhthi 5861104

