



2017
**LAB
REPORT**

PRESENTED BY

**PREEYAPORN TUNGTAVORNSUB
PHURIPAT YIMSERHTHI
PRAI WONGRUNGPAKORN
CHANISARA WANNA**

Rocket Project



OBJECTIVE & INTRODUCTION

OBJECTIVE

The objective of this project is to be able to apply the knowledge of chemistry and physics. To know the exact amount of gas in order for the rocket to be launched.

INTRODUCTION/BACKGROUND

In this project, the rocket was launched by acid and base. The reaction between base (NaHCO_3 or baking soda) and acid (CH_3COOH or vinegar) creates gas (CO_2 (Carbon-Dioxide)). Moreover, we need to create a design that is encouraging the rocket to launch and hit the target for example, building a hood structured wings, calculating the weight of the rocket, predicting the angle in order to launch the rocket well. Lastly, not only the design that affects that distance and direction the rocket launch, but also the wind direction and the chemical reaction inside the rocket, too.

MATERIALS



COLOR SPRAY



PLASTIC BOTTLE



TAPE



VINEGAR



BAKING SODA



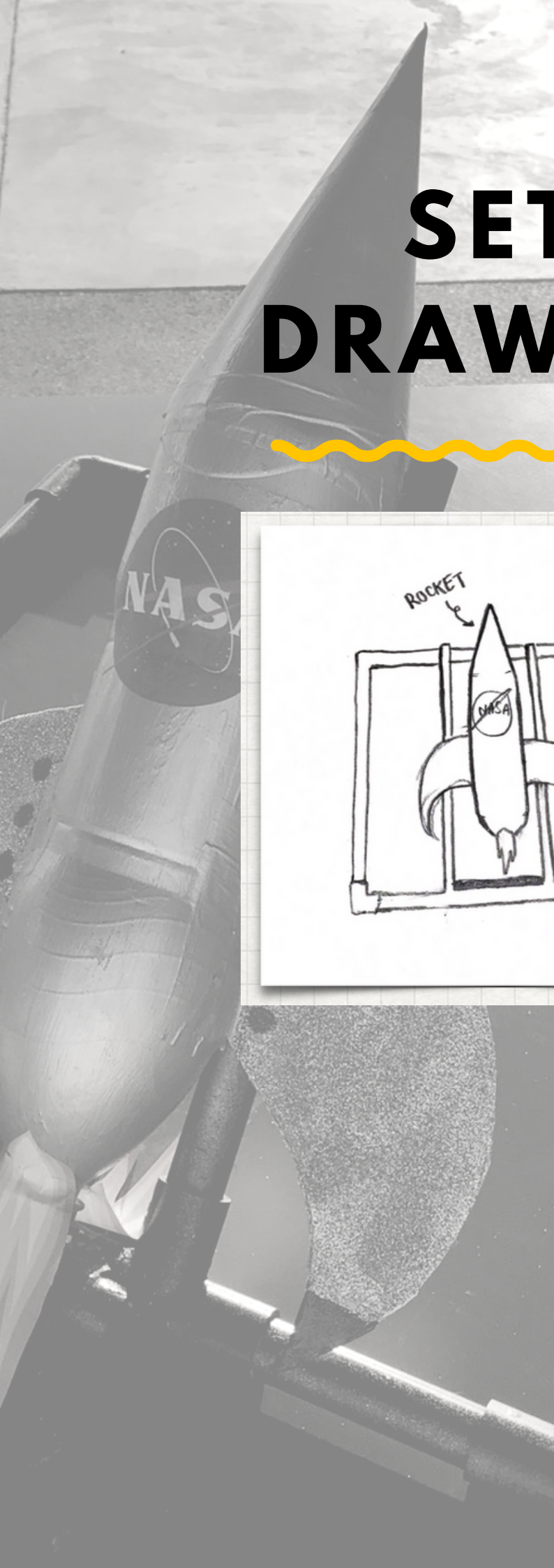
PVC PIPE



RUBBER CORK



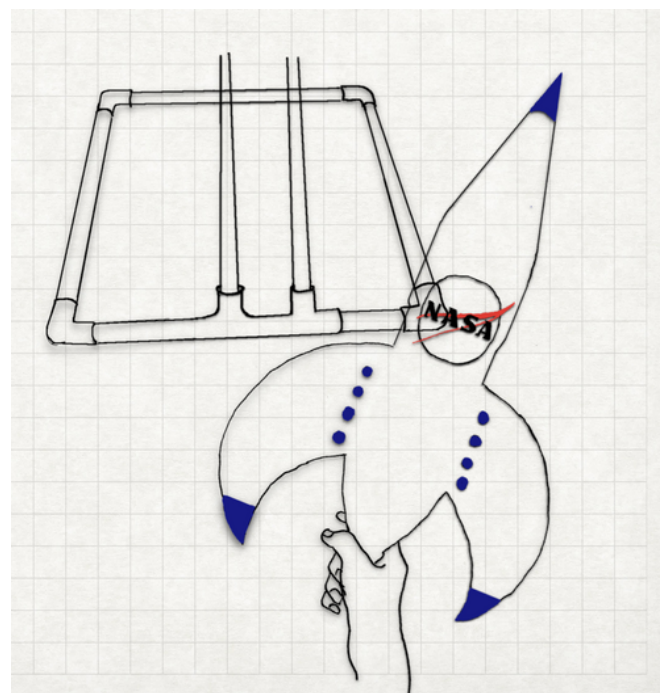
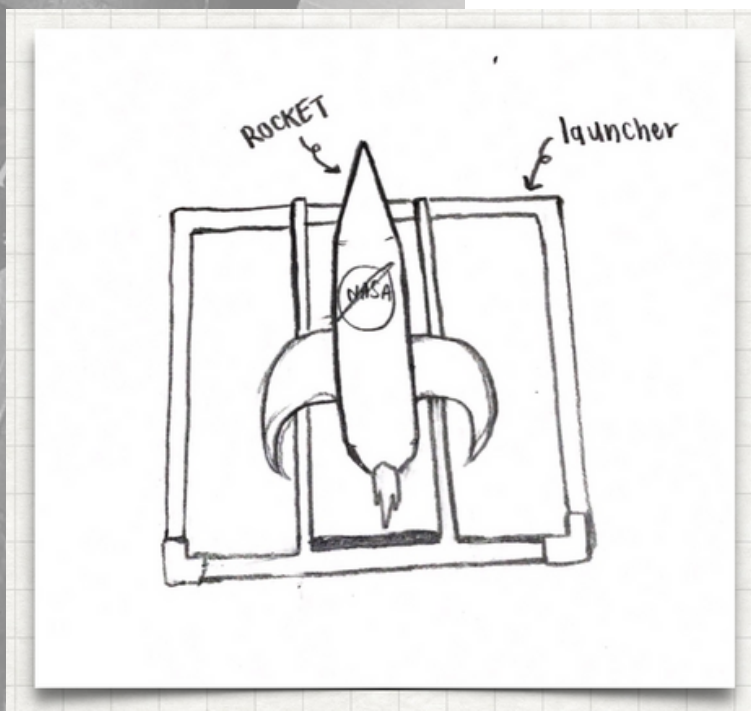
FLUTE BOARD



SET-UP DRAWING



WOO!
GROUP



DISCUSSION

ROCKET PROJECT



I. Measurement

Setting the launcher at 40 degree since it is the perfect angle, for our rocket, to enable the rocket to launch. We have tried to launch once using 70 degree of the launcher and it is too steep which make our rocket go not far enough

II. Newton's Law

First law: An object at rest will stay at rest and an moving object continue moving in the same speed and direction until external net force act. The rocket continue moving until air resistance build up to slow down the rocket, and the gravity that pull the rocket down.

Second law: An acceleration is directly proportional to force and inversely proportional to mass. In this case the force that push rocket forward come from baking soda and vinegar, that build up the gas to move the rocket.

Third law: In every action always have an equal and opposite reaction, which is a pair force that acting in the same time. When that gas that pump out, it cause the rocket moving forward.

III. Linear Motion (Free Fall)

Free fall is an object that falling under condition of gravity. After the gas run out the rocket will freely drop into the ground

IV. Projectile

A projectile is an object that is thrown in to the space by the exertion of a force, which is the gravity. In our project the projectile is the rocket. It is launch by using the launcher in order to make the rocket move forward or else without the launcher the rocket will move vertically into the sky and fall directly to starting point due to gravity.

DISCUSSION

ROCKET PROJECT



V. Impulse & Momentum

Momentum the quantity of motion of a moving thing, measured as a product of its mass and velocity. Momentum the quantity of motion of a moving thing, measured as a product of its mass and velocity.

Impulse is a product that cause by force multiple with time Impulse is a product that cause by force multiple with time

VI. Energy (Work, Power, KE, PE)

Work = How far that an object can go ($W = F * d$)

can measure Work of a rocket by time the force which is the gas that pump out with the distance.

Power = How fast work is done ($Power = work\ done / time\ interval$)

PE = Potential energy ($PE = mgh$) is when an object store energy inside in a readiness to do the work.

In this rocket experiment the potential energy happen before we launch the rocket, the reaction between baking soda and vinegar will cause the gas and after launch rocket, the potential energy will become zero. While the rocket is hanging in the air the potential is greater than when the the rocket is falling down, and finally the potential will become zero when the rocket reach the ground.

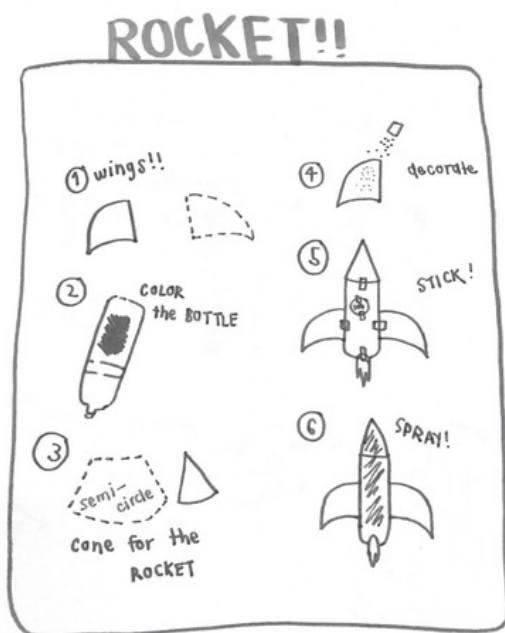
KE = Kinetic energy is an energy of motion which is depend on mass of the object and square of its speed ($KE = 1/2 * m*v*v$)

DESIGN

ROCKET

ROCKET PROJECT

| Mahidol University International Demonstration School |



1. Using a paper to sketch the wings
2. Place the sketch onto the flute board
3. Cut the wings out
4. Stick the wings to the water bottle equally
5. Cut a semi-circle on a card-stock and roll it to create a cone
6. Put the clay on top of the cone to make it heavier, so it won't sway too long in the air
7. Stick it to the bottom of the bottle acting as a tip of the rocket
8. Decorate it.

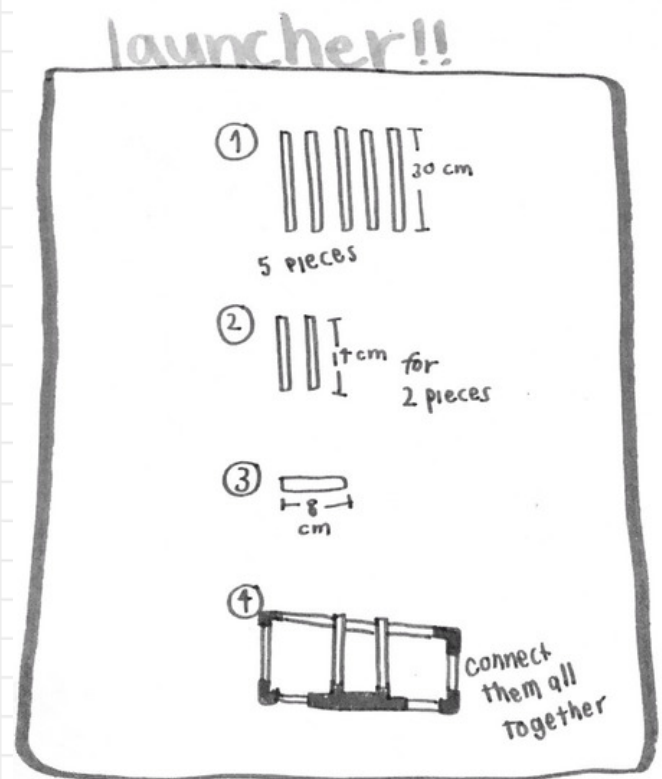


DESIGN

LAUNCH

ROCKET PROJECT

| Mahidol University International Demonstration School |



1. Cut a pipe into 3 different lengths. 5 of 30 cm pipe, 2 of 14 cm pipe and 1 of 8 cm pipe. So the totals of the pipe are 8.
2. Connect 3 of the 30 cm pipe together by using curved pipe.
3. Connect 2 of the 14 cm pipe at the reminding space.
4. Then attach 2 three way pipe at both of 14 cm pipe.
5. There will still a gap between 2 three way pipe and it will be unsteady.
6. Use 8 cm pipe connect it to reduce the gap.
7. Sticks 2 of 30 cm pipe on top of three way pipe.
8. Paint the launcher with black, dark blue, white and silver spray to make it look like the galaxy.

DATA TABLE

# of trial	vinegar (mL)	baking soda (g)	angle	distance	mass of the rocket
1	250	25	40	12	170.66 g
2	350	35	40	13	170.66 g
3	400	40	40	0	170.66 g
4	350	33	40	10	170.66 g
5	300	28	40	15	170.66 g
6	200	18	40	11	170.66 g

ANALYSIS OF DATA

- The design of the wings of the rocket is too curve caused the rocket to sway too long in the air instead of go straight down toward the ground (target)
- If we did not put clay on the top of the rocket to increase the weight, so the rocket will dash forward.
- Some the trial the rocket is almost hit the target but there is too much wind which make our rocket resist the wind instead of moving toward the target.
- Not only the design of the rocket that affected the flight but also the chemical reaction inside the bottle also affected the launching,

CONCLUSION & RECOMMENDATION

CONCLUSION

Our rocket was not be able to hit the target due to the wind and the shape of the wings. Also, the gas within the bottle affected the ability of the rocket to move forward. The action is the baking soda and vinegar acting together while the reaction is the rocket moving forward.

RECOMMENDATION

- If we could improve we will change the design of the wings since the design make our rocket stay in the air too long.
- If we add more weight the rocket might move more forward instead of changing the wings.
- We better launch the rocket in the same direction as wind go.

REFERENCES

<https://explosives.wonderhowto.com/how-to/make-high-flying-vinegar-and-baking-soda-water-bottle-rocket-389296/>

F. (2017, February 24). How to Make a Baking Soda and Vinegar Rocket. Retrieved February 26, 2017, from <http://www.wikihow.com/Make-a-Baking-Soda-and-Vinegar-Rocket>



MRS. PATTERSON'S SCIENCE LESSON PLAN

PHURIPAT

- Launcher
- Lab Report
- Rocket
- Presentation

PREEYAPORN

- Launcher
- Rocket
- Lab Report
- Presentation

PRAI

- Launcher
- Rocket
- Lab Report
- Presentation

CHANISARA

Launcher
Rocket
Lab Report
Presentation

**WE ARE HELPING EACH
OTHER FOR EVERY WORK
:')**