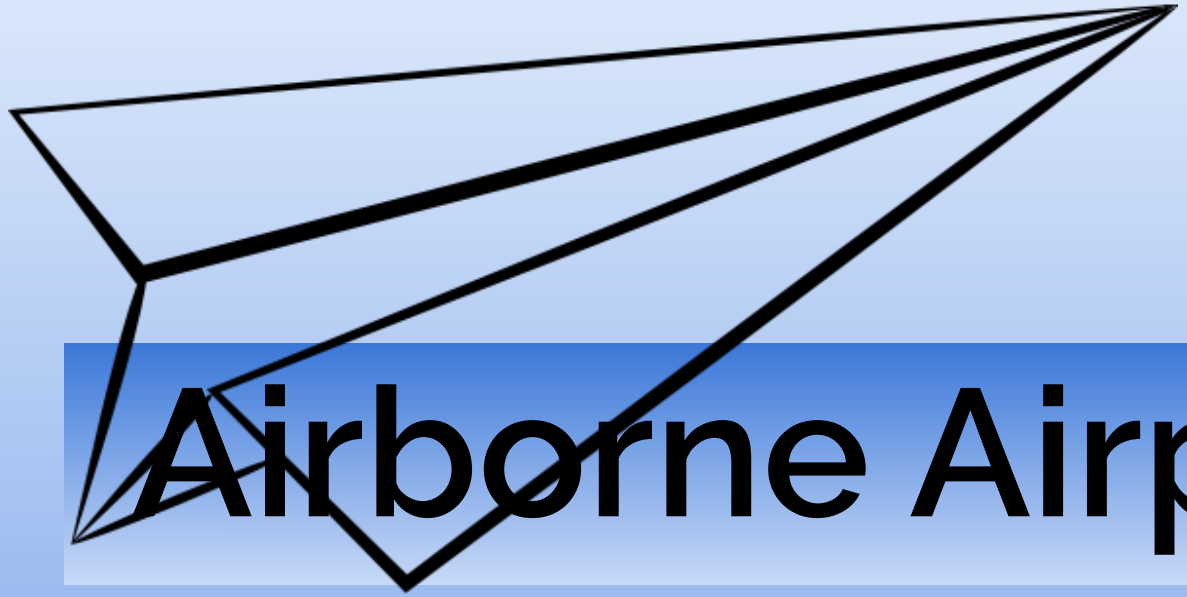
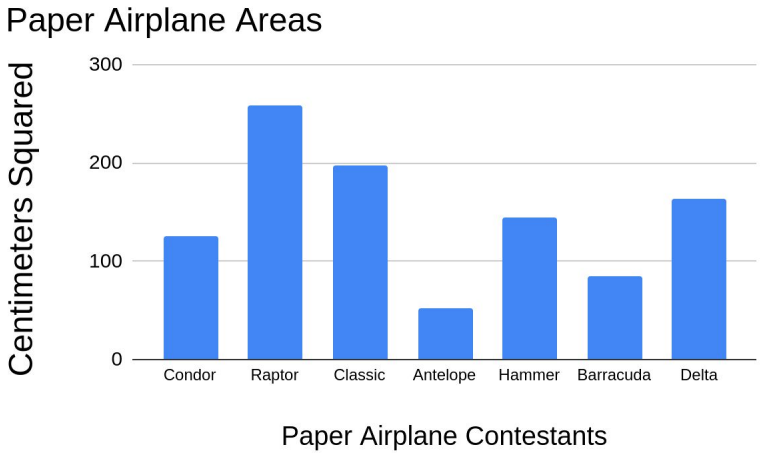


Airborne Airplanes!

-William And Charlie



The area of the planes are:

Condor: 126 cm^2
Raptor: 259 cm^2
Classic: 198 cm^2
Antelope: 52 cm^2
Hammer: 144 cm^2
Barracuda: 85 cm^2
Delta: 164 cm^2

Testable Question

Which paper airplane style will stay airborne the longest and why?

Results

In the end the scores are:

#1 Raptor with 3.94 seconds

#2 Antelope with 2.95 seconds

#3 Condor with 2.29 seconds

#4 Delta with 2.18 seconds

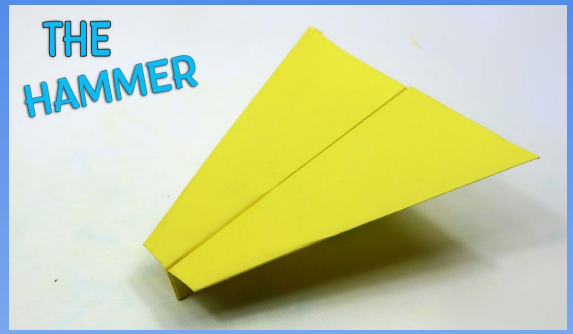
#5 Barracuda with 2.17 seconds

#6 Classic with 1.33 seconds

#7 Hammer with 1.24 seconds

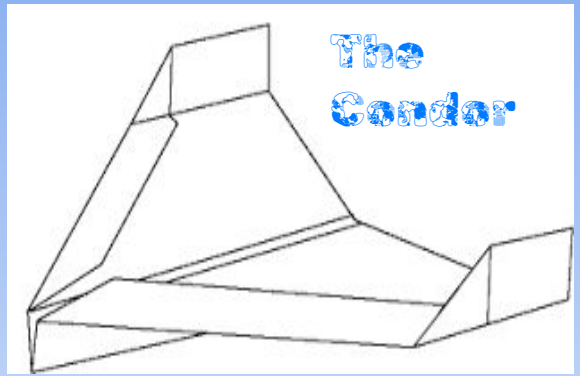
Applications

In the future, our experiment can be reproduced, and used for the future manufacturing of real aircrafts. We can also recommend easy to make and efficient airplanes to people who want a good paper airplane.



Hypothesis

Charlie: I think the Hammer will stay airborne for the longest because of its wings expanding the further along the back of the plane.



William: I think the Condor is going to win because it looks like it will have good lift (air flowing upward), and also because the fins at the back look like they will help with the lift.

Procedure

1. We arrive at the scissor lift with the paper plane contestants.
2. We ride the scissor lift to throw the paper planes and measure the height of the scissor lift to make sure its exactly 14ft high.
3. While we throw the planes, we record the airtime with a stopwatch, and write down the results on a clipboard for each plane's results. We repeat this 4 times for better accuracy.
4. Once we've recorded our results 4 times we take the average of each planes flights with the following formula ((1st flight time)+(2nd flight time)+(3rd flight time)+(4th flight time)÷4) which will equal our accurate results.

Observations

Our observations for the different planes are:

Classic: Was able to stay in the air for a reasonable amount of time but usually plummeted to the ground.

Hammer: This is a good plane for going far but not for staying in the air.

Condor: Was able to stay in the air for a long time and went by far the farthest.

Delta: The results were similar to the classic but traveled farther and had less drag (the force that pushes the plane backwards.)

The Raptor: This plane could stay in the air for a long time but, spiraled and often flew back to us.

Barracuda: Being a small plane, it flew fast and stayed in the air for a decent amount of time.

Antelope: This was the smallest plane out of all the contestant planes but, with enough thrust you can make this plane go fast and far. This plane could stay in the air for a long time if you wanted it to. We had to throw this plane with the same amount of thrust as the other contestant planes.

Background Knowledge and Research

We know a bit on how to craft some paper airplanes from a sheet of A4 paper. The paper airplanes we are going to be using are some of the average, everyday paper airplanes that you usually think of when somebody says; “paper plane”. As some extra flavour, we will be doing two airplanes that are more advanced than regular paper airplanes.

Materials

Our materials for our project are:

- A4 paper
- Scissors
- Scissor lift
- Stopwatch (phone stopwatch)
- Ruler
- Pencil

Controlled Variables

Our controlled variables are the hight of the scissor lift (14ft), the force we are throwing the airplanes and the type of paper we are using.

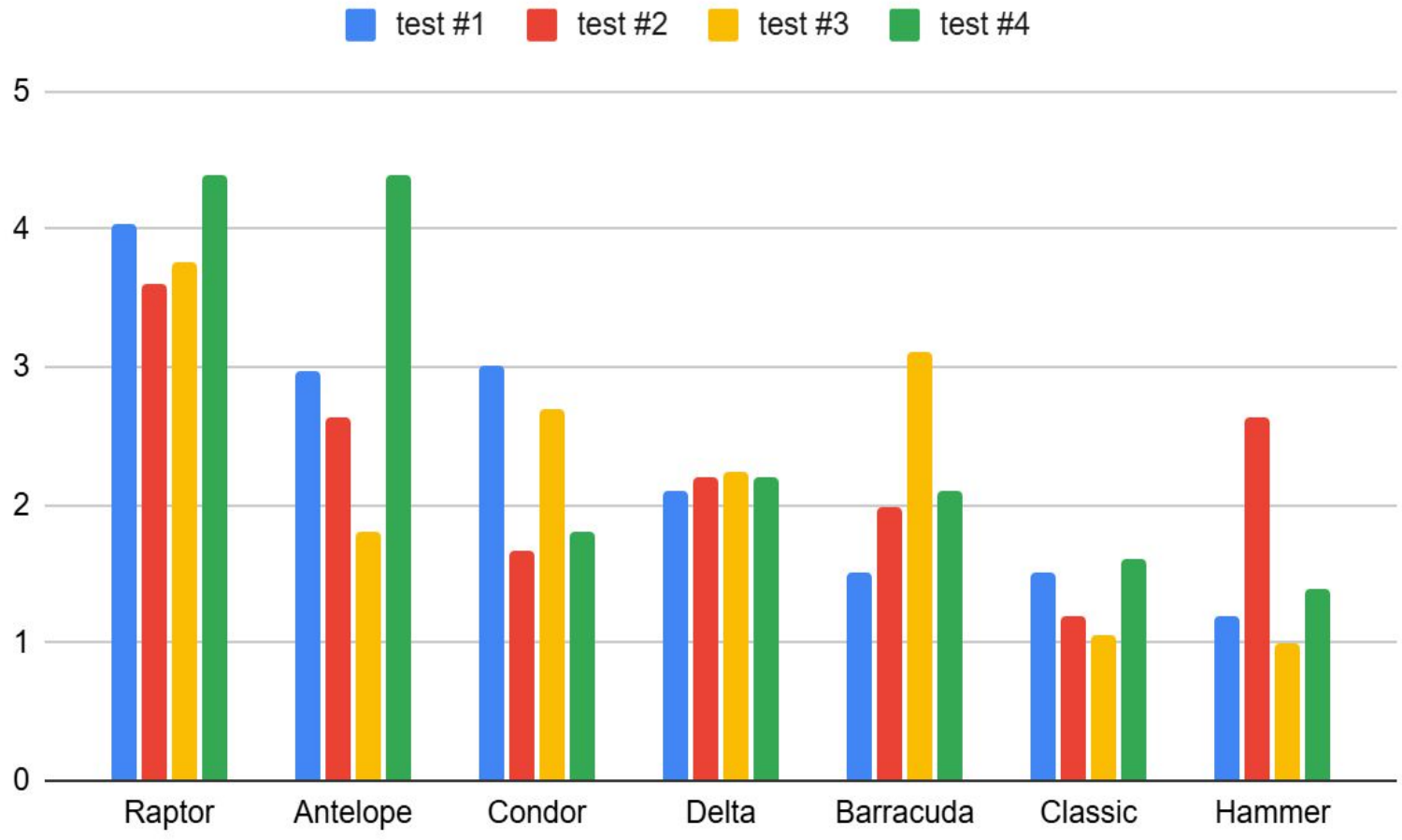
Manipulated Variables

The manipulated variables that we have are the shape and size of the airplanes, and the weight of the airplanes

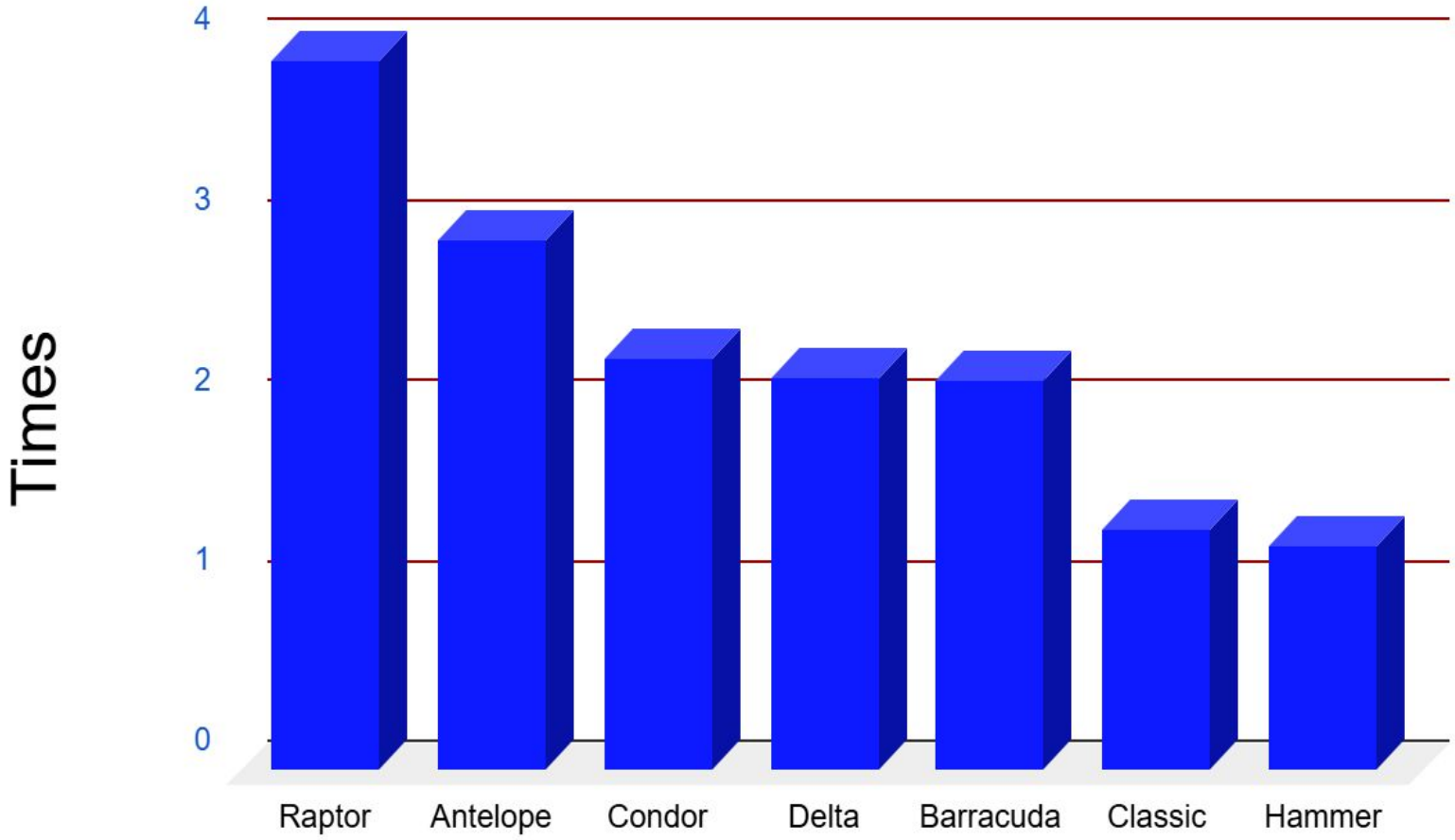
Responding Variable

The responding variable of our project is the amount of time the corresponding paper plane lasts in the air

test #1, test #2, test #3 and test #4



Official time recordings



Sources of Error

Some of the things that could've impacted our results are, making sure that our throws were accurate and equal so that the results are more accurate.
Another thing that we could do differently next time is that we could make sure that we make four different airplanes for each test. If we did that, it would take a big chunk of time to make all the airplanes again. A lot of them are very complicated to make, and if we didn't perfectly recreate the planes, there would be mixed results.

Research and Sources

Sources: Parts of our background knowledge is from siblings and parents, searching up how to make paper airplanes in books and in youtube,We also have a book on paper airplanes and how to fold a some of them.

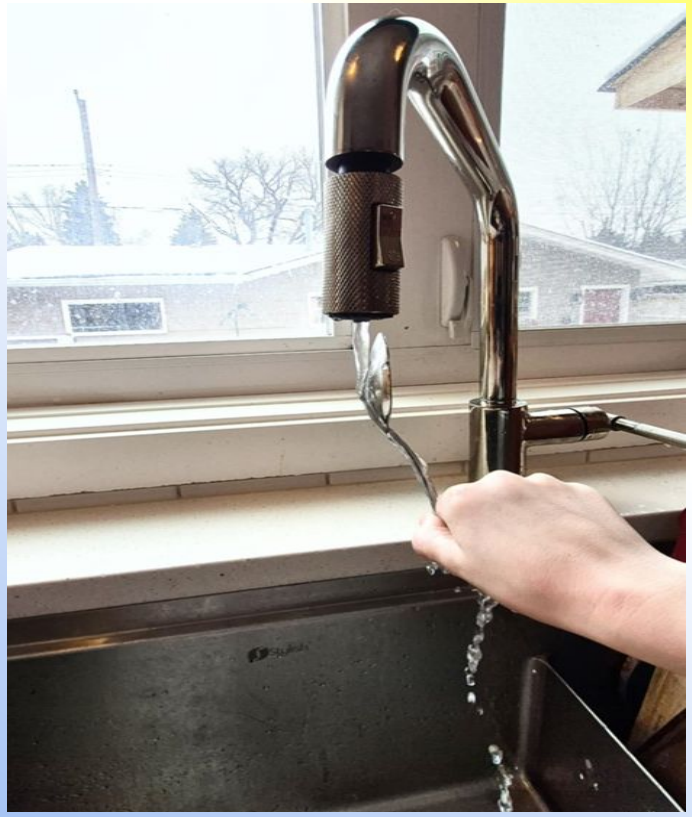
Other Wonders we Have About this Experiment

We wonder how precise the changes in the folds of the planes affects it's flight compared to other planes, and how it will affect how long it stays in the air.

We wonder that if the way the paper is bent will change the course of the plane's flight.

What is the coanda effect?

The coanda effect is when the flow of air touches an object and follows the path of the object until the object ends. E.g., if you put a spoon, flipped on its side, and put it under a flowing faucet, the water sticks to the spoon, and eventually falls off, following the direction of the end of the spoon.



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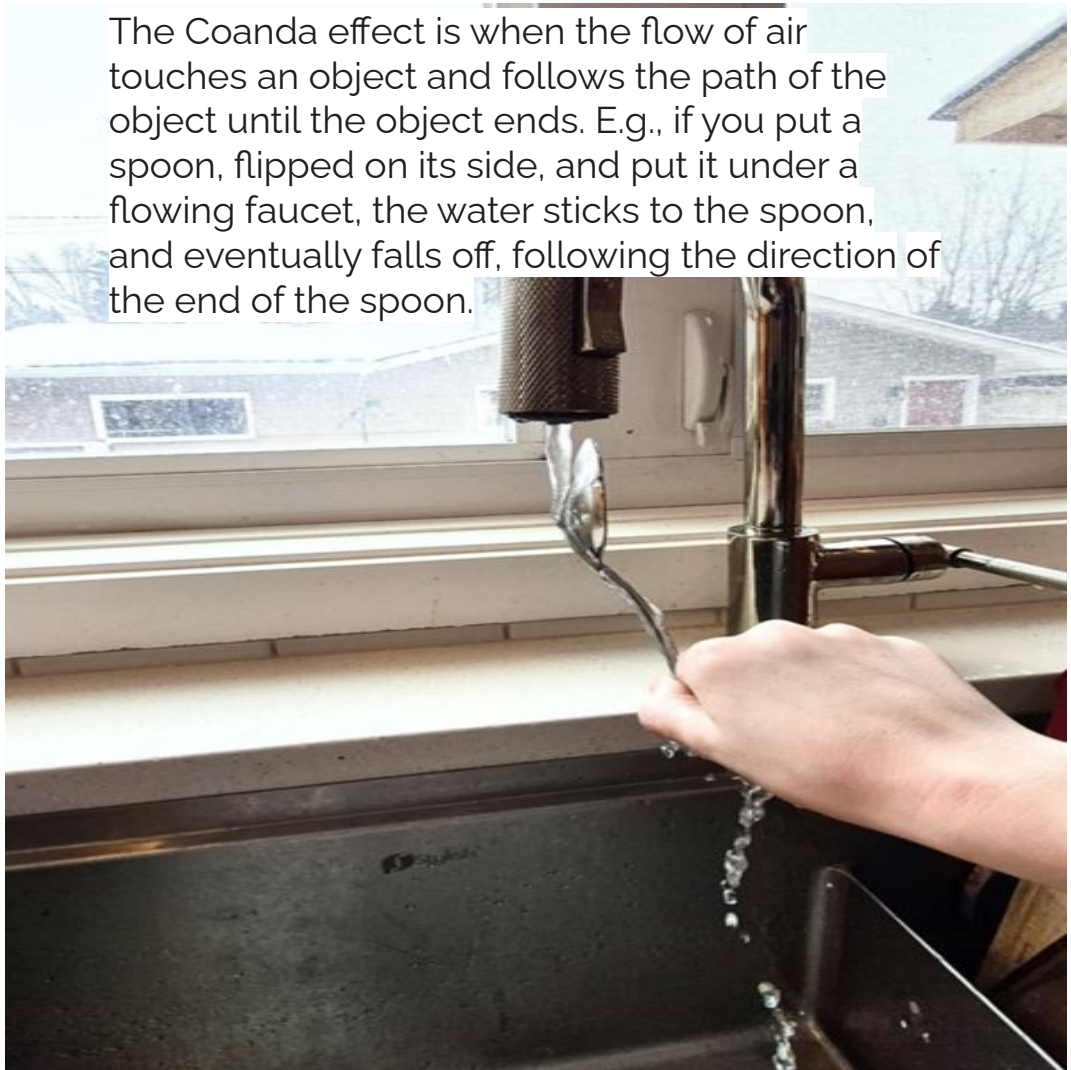


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