

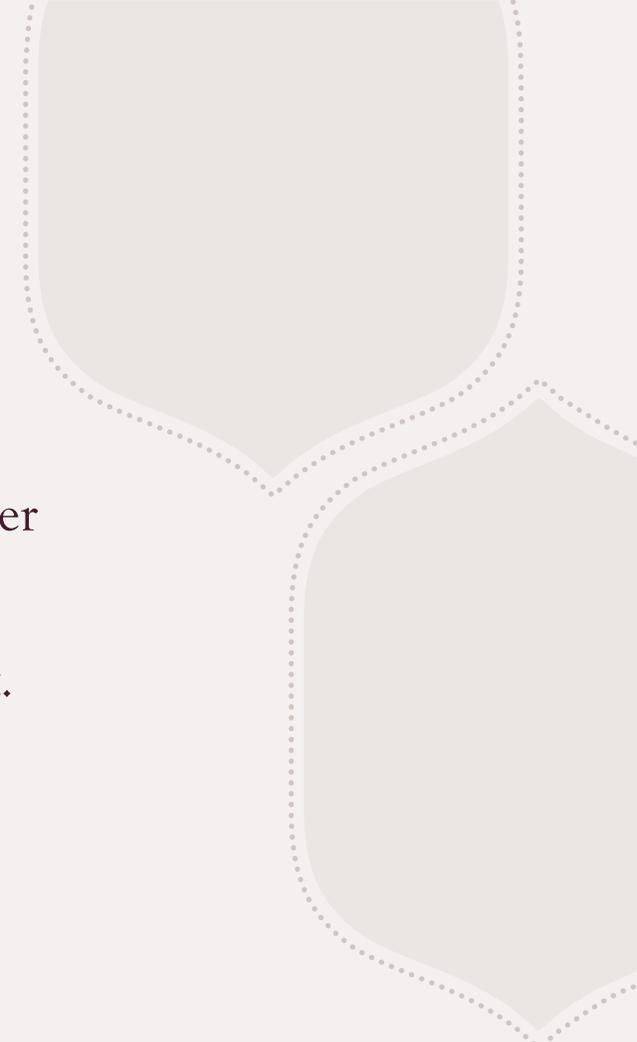
How Does
Changing the
Wings on a
Paper Airplane
Affect the Flight
Distance?

Abstract

- ♦ Project Design Plan: * I want to know what type of paper airplane model will fly the farthest. I believe airplane design is very important when trying to see how far a paper airplane will fly. The different shape and narrowness or width as well as weight distribution are all factors in flight distance. So if I have a narrow paper airplane, a very wide one, and one in between, which one will fly the farthest? * The relevance of this experiment is similar to understanding a real airplane. Paper airplane models are derived from an actual plane these days. The design of an airplane has so much to do with distance, hang time, speed, and many other factors.

Introduction/Purpose

- The purpose of this experiment is to determine what design would make a paper airplane go the farthest.
- I became interested in this experiment when my original idea did not work out.
- The information gained from this experiment will help kids make better paper airplanes.



Research Question

- Research Question: How Does Changing the Wings on a Paper Airplane Affect the Flight Distance?
- Independent Variable (What will you be changing?): Wing Design
- Dependent Variable (What will you be measuring?): Flight Distance

Background Research

- On 24 June 2015 David Green achieved the highest altitude paper plane launch recording an altitude of 35,043 meters (114,970.5 feet).
- The plane was launched as part of a high school science club activity.
- I don't have a video of that launch but to give you an idea of what it might have been like, on 13 September 2014 a group of 12 and 18 year old Civil Air Patrol Cadets attempted a world record by launching a paper airplane on the edge of space. The Fox Valley Composite Squadron launched a helium weather balloon from the Kankakee Airport, Illinois, United States. At 29,424.5 meters (96,537 feet) the balloon bursting and the airplane fell back to earth. The flight lasted just over 2 hours.
- The mission was a Science, Technology, Engineering and Math (STEM) project for the cadets.

Hypothesis

- If the wing design of a paper airplane affects the flight distance, then the design with the wing flaps up will go the farthest because it would provide more drift.



Materials

- Copy Paper (3 sheets)
- Ruler
- Meter Sticks (5)



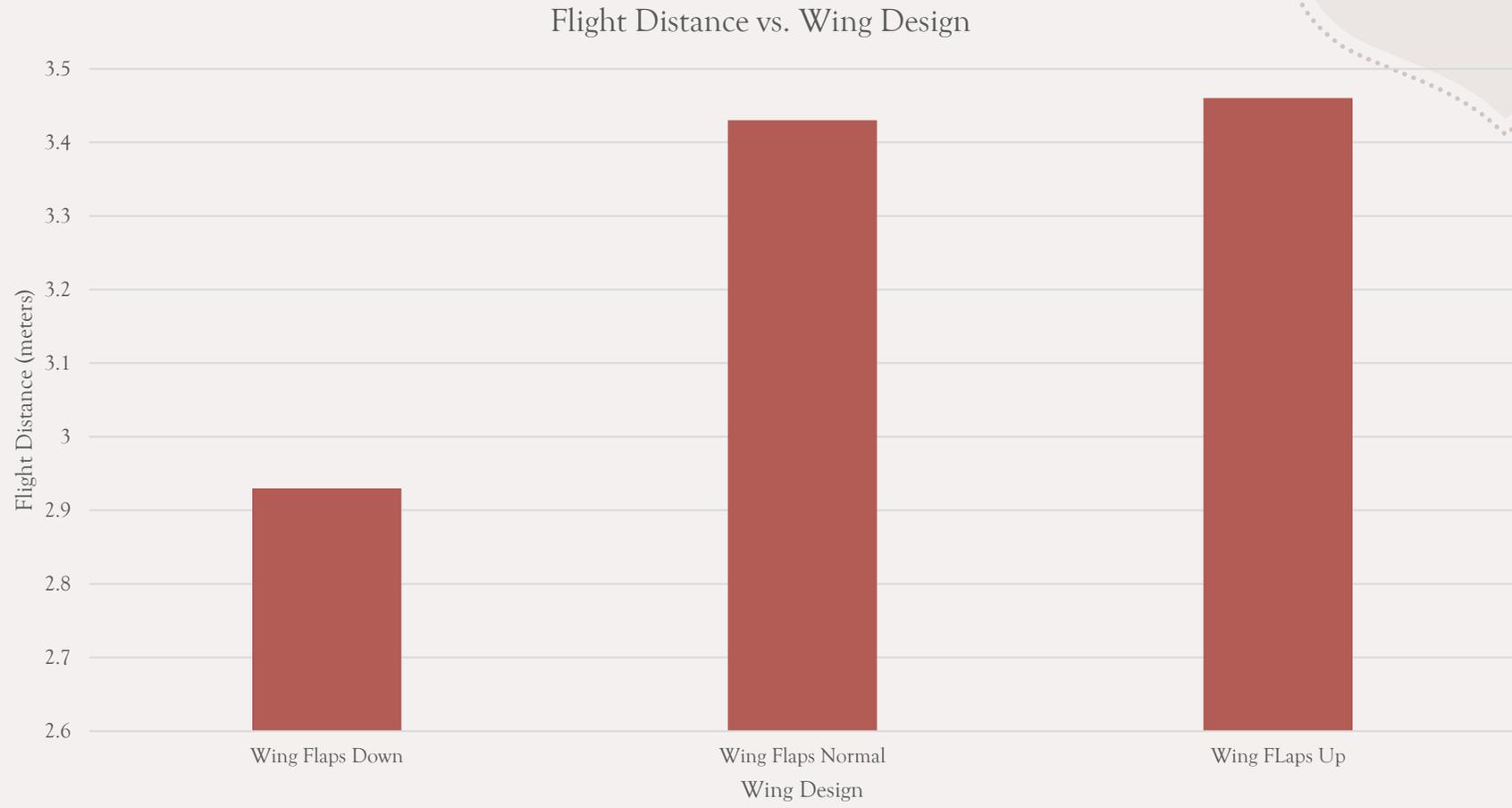
Procedures

1. Make three paper airplanes of the same style except for the wing flaps. On plane #1, fold the wing flaps down. On plane #2, make the wing flaps stick straight out. On plane #3, make the wing flaps fold up.
2. Throw each plane, one by one, three times.
3. Measure the flight distance.

Data Table

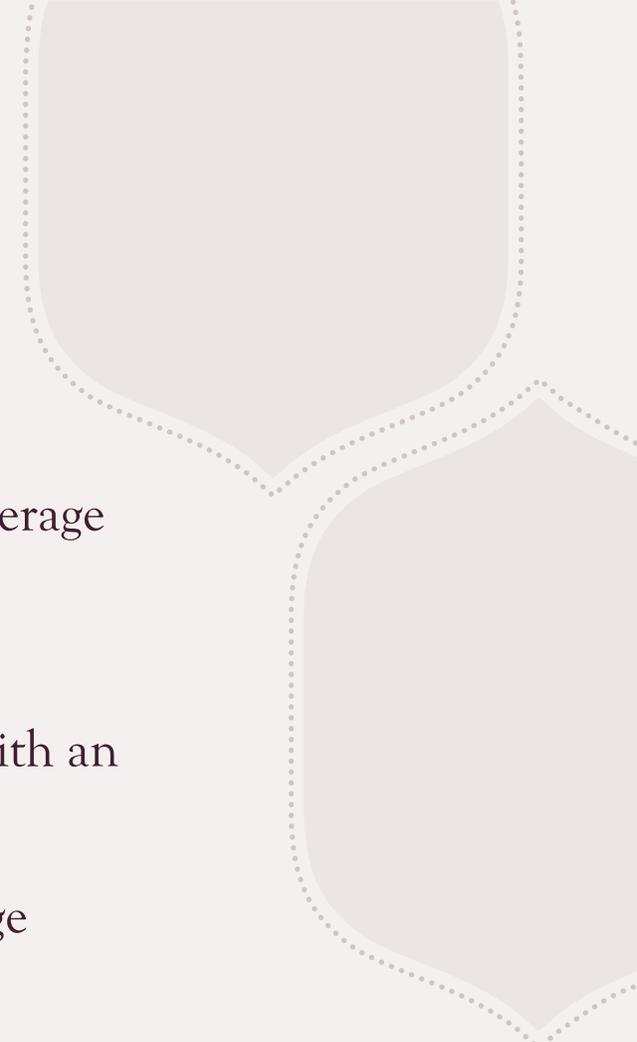
	Flight Distance (meters)			
Wing Design	Trial 1	Trial 2	Trial 3	Average
Wing Flaps Down	3.58	2.68	2.52	2.93
Wing Flaps Normal	3.90	3.04	3.36	3.43
Wing Flaps Up	3.94	2.71	3.75	3.46

Graph



Results

- The plane with the wing flaps down had the shortest flight distance with an average 2.93 meters. This result may have been affected by a tear in the base of the plane. The tear was repaired with a glue stick.
- The plane with the normal wing flaps had the second longest flight distance with an average of 3.43 meters.
- The plane with the wing flaps up had the longest flight distance with an average of 3.46 meters.



Conclusion

- ♦ The original hypothesis of this experiment was that the plane with the wing flaps up would have the longest flight distance. This was proven with a flight distance 0.03 meters longer than the next design. Other independent variables for this project could include the total length of paper used to build the planes.
- ♦ From this experiment, I learned about the forces of flight including drift, lift, and drag.
- ♦ My findings could be used to help other people build better paper airplanes.

References

- ♦ <https://paperplannedepot.com>
- ♦ <https://kids.kiddle.co>
- ♦ Facts: Paper Planes | Squizzes

