SASTA OLIPHANT SCIENCE AWARDS

Prize Winner

Scientific Inquiry

Year R-2

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Paper Planes Inquiry

Questioning and Predicting

Our project is about paper planes, and we are asking the question: **What type of paper plane will go further and fly for longer?**

We both hypothesise that paper planes with more folds will go faster and fly the longest.

Planning and Conducting

To test our hypothesis, we decided to build three paper planes.

- Aeroplane 1: A basic paper plane with 5 folds
- Aeroplane 2: A more complex paper plane with 9 folds
- Aeroplane 3: A Multifaceted paper plane with 15 folds

We will measure the distance flown by each paper plane and time how long each paper plane flies before falling to the ground.

We considered the variables which might affect the inquiry and concluded that factors such as wind, objects such as walls and how the plane is thrown (soft or hard) could affect the result. For this reason, we decided to;

- throw each plane three times and calculate the average time and distance for each plane.
- conduct our inquiry outside on a sunny day with little wind
- take turns to throw each plane

Steps:

- Draw a line from where each plane will be thrown
- One person to be plane thrower and stand at the line with the plane ready to throw
- Other person to be on the timer and as soon as the paper plane is thrown, start the timer
- Stop the timer when the paper plane hits the ground
- Record the time on a piece of paper in seconds
- Draw a line with chalk where the nose of the plane stopped
- Measure distance of how far the plane travelled
- Record the distance in centimetres
- Swap roles
- Repeat this procedure 2 more times to get 3 times for each paper plane
- Calculate and record the average distance and time for each plane.

Equipment and Materials

- 3 x paper planes
- Tape Measure
- Stopwatch timer
- Pen and Paper
- Chalk

Risks

We identified two possible risks when planning our inquiry;

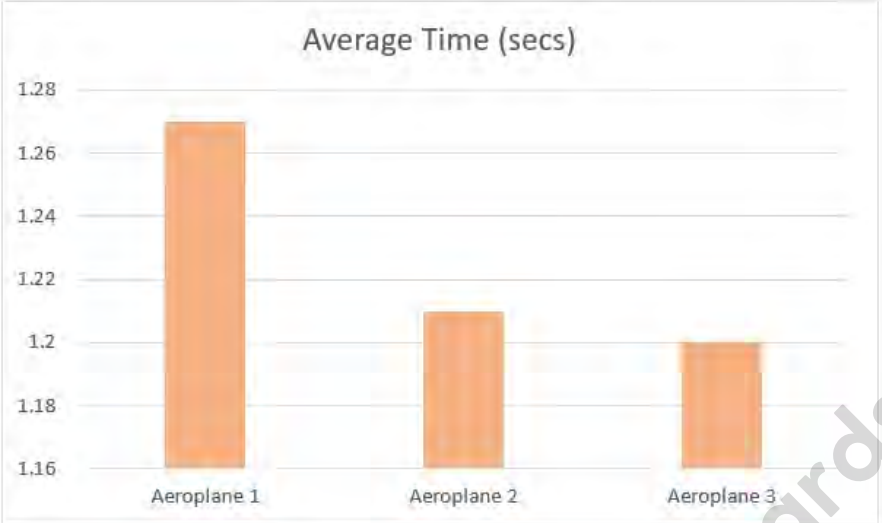
1. Paper Cuts: When handling the paper to make the paper planes and when throwing the paper planes, there is a risk that we can cut ourselves. To reduce the risk, we made sure we took care when handling the paper and paper planes and had Band-Aids in case we had an accident.
2. Sharp edges on the tape measure: The tape measure we used had sharp edges and there was a big risk that we could cut ourselves. To make sure we did not hurt ourselves we asked our mums to help us when we handled it and had Band-Aids in case we had an accident.

Graph and data Interpretation

Aeroplane 1: 5 folds	Attempt 1	Attempt 2	Attempt 3	Average
Distance (cm):	305	489	323	372
Time (secs):	1.24	1.51	1.06	1.27

Aeroplane 2: 9 folds	Attempt 1	Attempt 2	Attempt 3	Average
Distance (cm):	384	123	283	263
Time (secs):	1.25	1.1	1.29	1.21

Aeroplane 3: 15 folds	Attempt 1	Attempt 2	Attempt 3	Average
Distance (cm):	340	335	543	406
Time (secs):	0.88	1.63	1.1	1.20



The graphs and results show that our hypothesis was not all correct.

Hypothesis Conclusion:

- Aeroplane 1 had the greatest amount of airtime, which is not what we originally predicted.
- Aeroplane 3 flew the longest distance which is what we did predict.

After lots of thought we concluded that the aeroplane with less folds may have flown for longer because it was lighter than the others and the aeroplane with the most folds flew further because it had a greater wingspan and had stabilisers on its wings.

Evaluation

After conducting the investigation, we believe further testing is required to determine what makes a paper plane fly longer and further. The investigation could be improved by choosing similar types of paper planes to compare against, such as those with a similar weight or same number of folds but different designs to determine what makes them fly longer and further. This further inquiry would be interesting for other students such as our friends who enjoy building and racing paper planes at school. Other questions that could be further investigated include:

- Do stabilisers make paper planes fly further?
- Does the size of the wingspan on a paper plane help the plane fly longer?

Communication

Our knowledge about paper planes has come from making our own paper planes at school and at home, watching tutorials on YouTube and talking to our friends, who also love to make paper planes.

The paper planes were made at home with A4 sheets of paper. In our inquiry we conducted the experiment with some help from our mums to record and calculate results. We answered all the questions, and our mums typed our report.

References

You Tube:

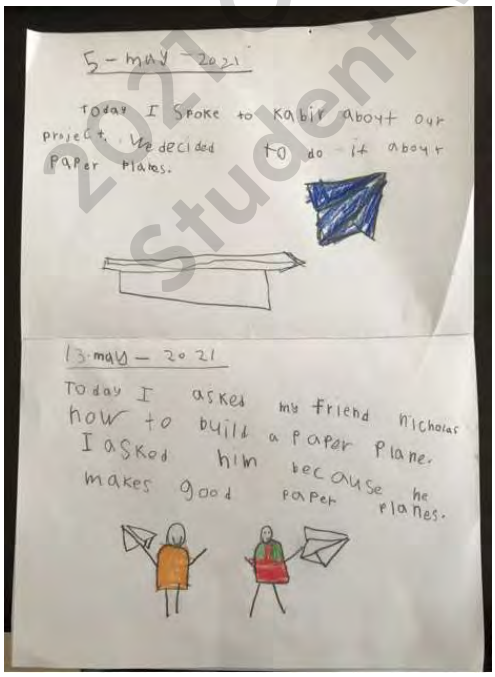
- How to Make the New World Record Paper Airplane || How to Make a World Record Paper Airplane 2021 - YouTube

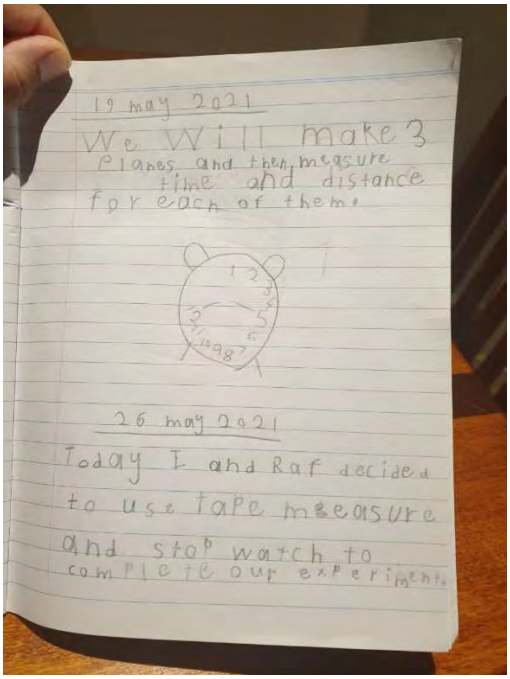
- How to make world record paper airplane for flight time- https://www.youtube.com/watch?v=JV2aMbGtmZE

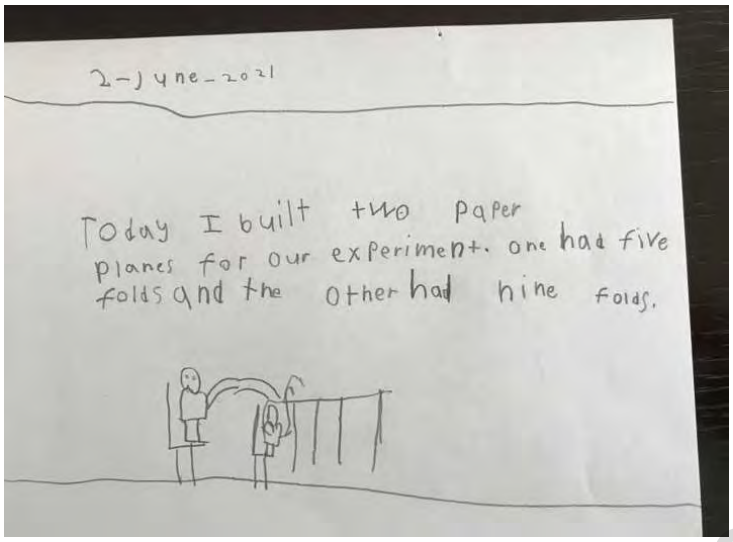
Book:

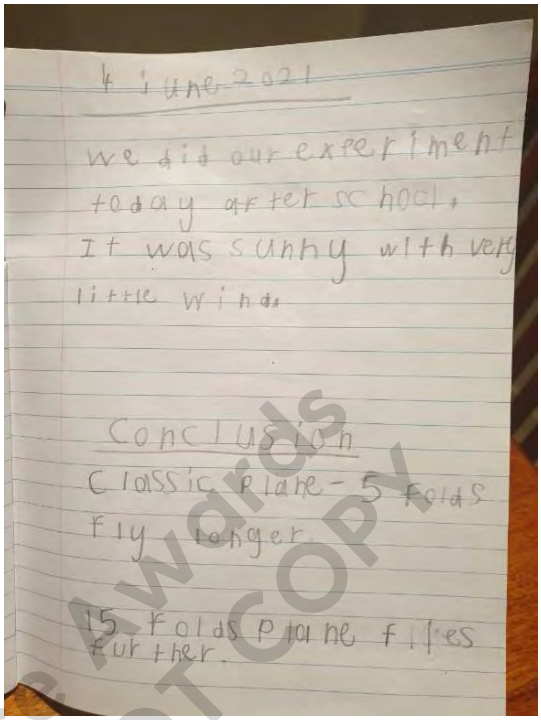
Discussion with friend: Nicholas Bletas (13 May 2021)

Journal (entries from both Kabir and Rafael):

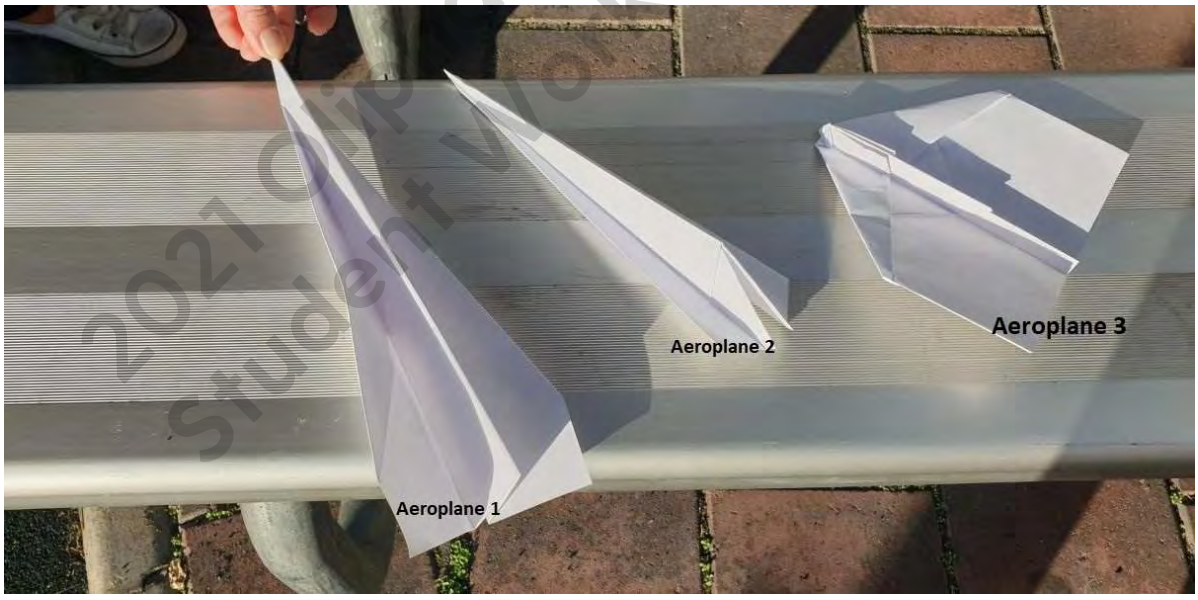




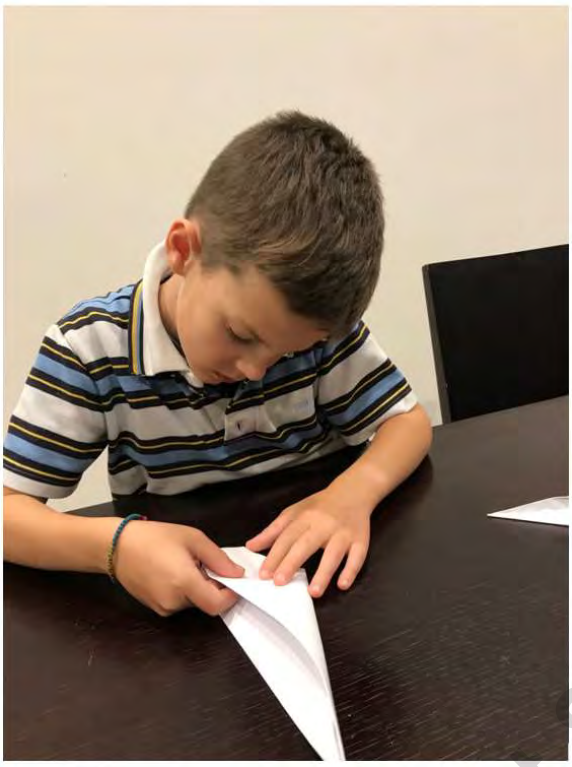


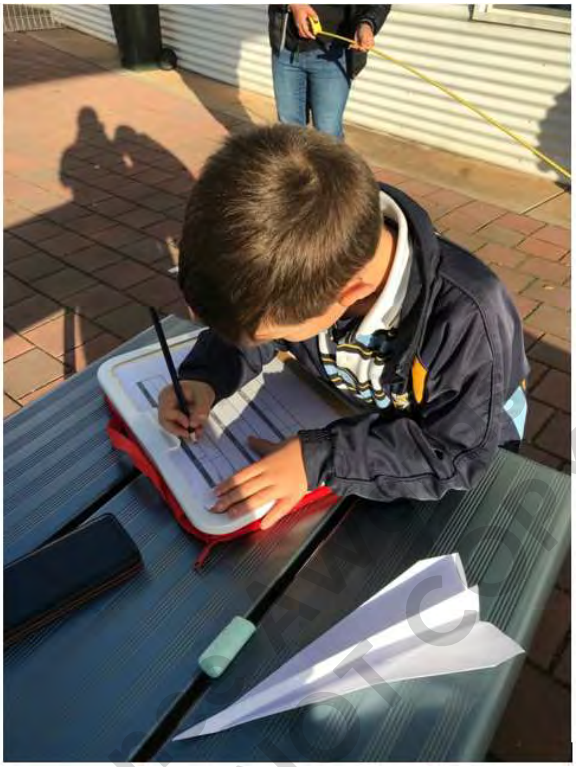


Aeroplanes:

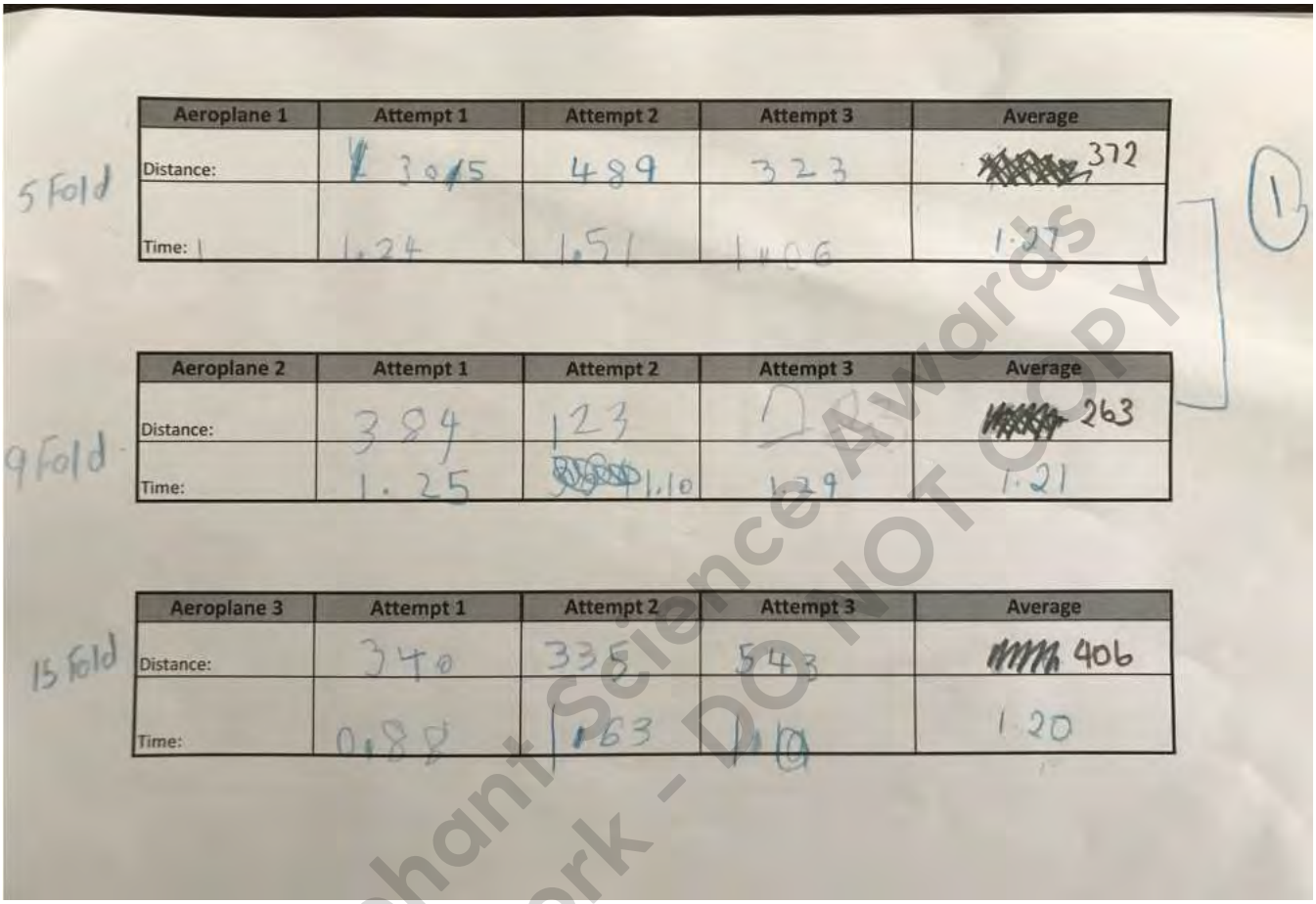


Planning and Conducting Experiment:





Results



5 Fold

Aeroplane 1	Attempt 1	Attempt 2	Attempt 3	Average
Distance:	305	489	323	372
Time:	1.24	1.51	1.06	1.27

9 Fold

Aeroplane 2	Attempt 1	Attempt 2	Attempt 3	Average
Distance:	384	123	[illegible]	263
Time:	1.25	1.10	1.29	1.21

15 Fold

Aeroplane 3	Attempt 1	Attempt 2	Attempt 3	Average
Distance:	340	335	543	406
Time:	0.58	1.63	1.19	1.20