



Highly Commended

Science Investigation

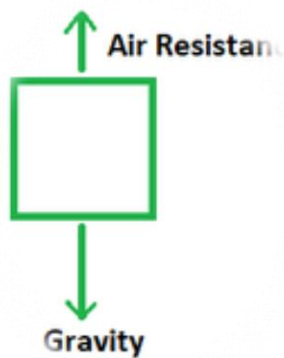
Year R-2

Diyon Kodithuwakku

Mawson Lakes School



How does the shape of paper affect how fast it falls?



Diyon Kodithuwakku

Mawson Lakes School
Year 2

Questioning and predicting:

Question: Which paper shape falls the fastest?

Hypothesis (Prediction): I think the crumpled paper ball will fall the fastest because it catches less air.

Planning and conducting:

- **Why I chose this method for my investigation.**

I wanted to test one shape at a time. I only changed the shape of the paper and kept all the other variables the same. This method made it easier for me to find out if the paper shape affected how fast it fell. This helped me to do a fair test.

- **The variables in my investigation**

- Shape of the paper
- time taken to reach the ground
- size of the paper
- type of paper
- height
- place
- frequency of tests (how many times I did the test)

- **Variable I changed**

The shape of the paper

- **Variable I measured**

The time taken to reach the ground by each shape of paper

- **Variables I kept the same**

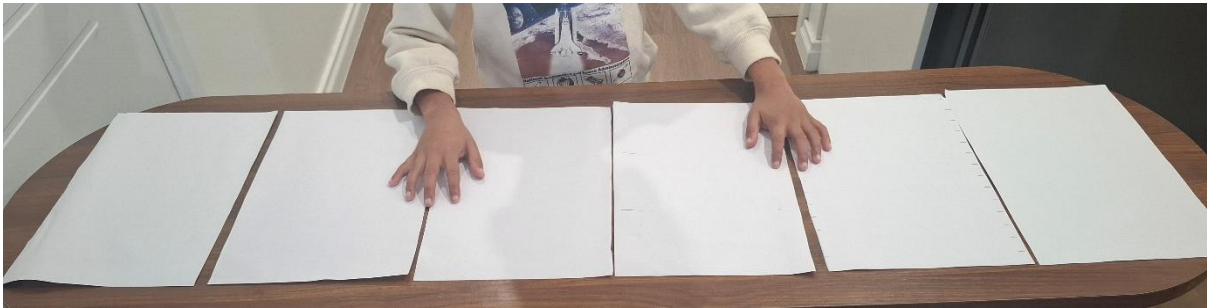
- Same size A4 paper
- Same type of paper
- Same height
- Same place (indoor)
- Five tests for each paper shape

- **Was it a “fair test”?**

Yes. It was a fair test because I kept everything the same except the shape of the paper. This helped me compare the paper shapes fairly. I only changed the shape of the paper because I wanted to find out how the shape affects how fast it falls.

- **Method**

1. I collected six A4 sheets of the same size and type of paper.



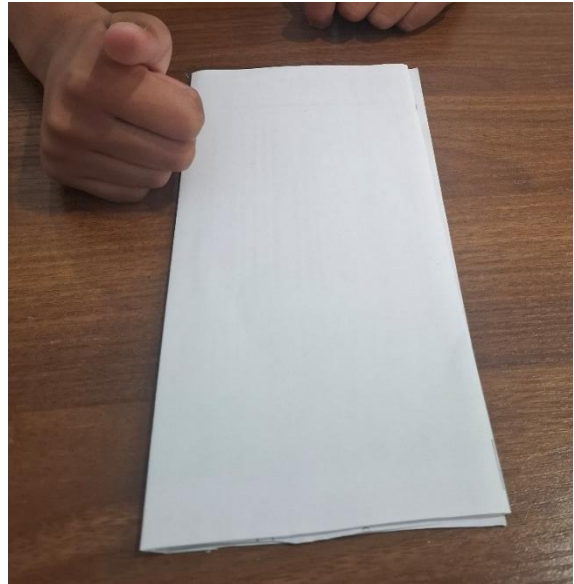
Six same-sized A4 papers

2. I made six different paper shapes from each paper.

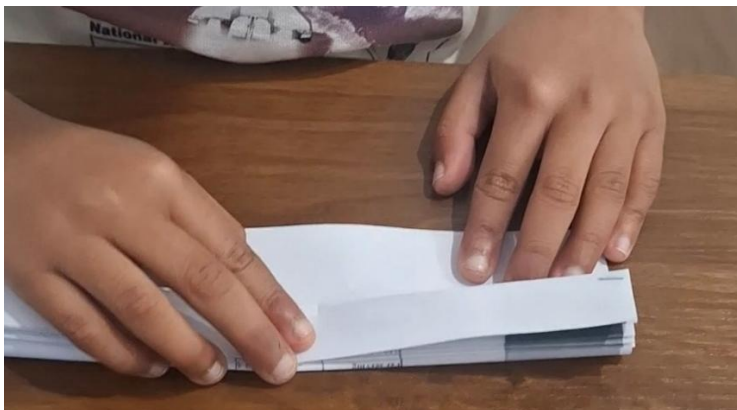
- 1 Flat paper
- 2 Crumpled paper ball
- 3 Half folded paper
- 4 Tri-folded paper
- 5 Quarter-folded paper
- 6 Folded in accordion shape



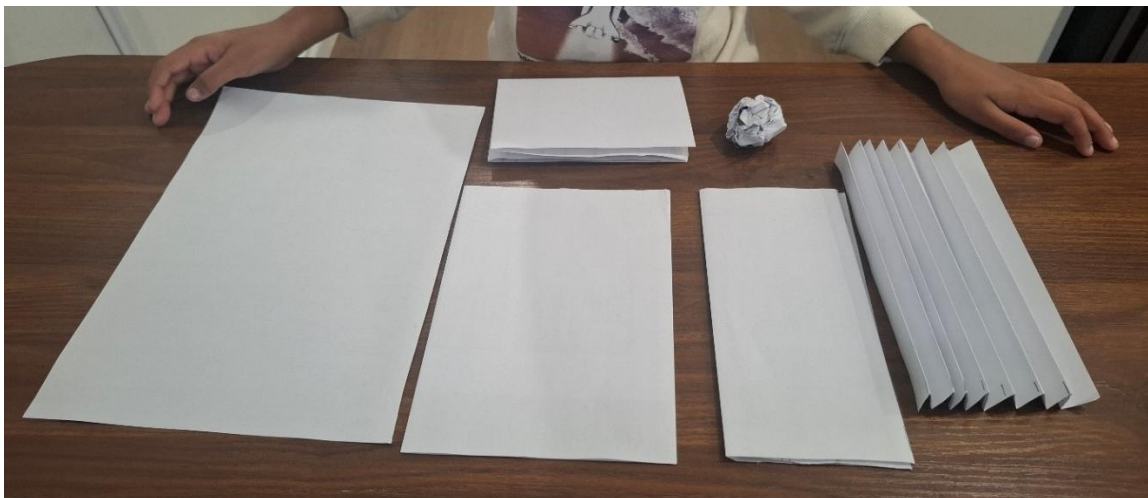
Making a crumpled paper ball



Making a tri-fold



Making an accordion fold



Six paper shapes

3. My dad used sticky tape to mark the same height on the door next to the sturdy table. This helped me drop the paper from the same height every time.
4. At first, I used a chair, but it was not high enough. I decided to use our sturdy table because it was higher.
5. I stood up on the sturdy table and dropped each paper down from the same height. My dad stayed behind me to protect me from falling while I tested six shapes.



Accordian fold falling

6. I tested each paper shape five times.
7. My sister used a stopwatch to measure how long each paper shape took to reach the ground.
8. My mum took photos and videos while I did the test.
9. I recorded the times in my log book table.
10. My dad helped me to calculate the average time for each paper shape.
11. I compared the results to find out which paper shape fell the fastest.

Equipment and Materials:

- **List all the equipment and materials that you used in your investigation.**
 - 6 sheets of A4 paper
 - Phone stopwatch
 - Sturdy table
 - Sticky tape
 - Pencil
 - Logbook

- **Risks and how I controlled the risks**

Risks	How I managed the risks
Paper cuts	I held the paper carefully
Falling from the sturdy table	My dad stood behind me to help keep me safe.
Tripping over objects	I kept the floor clear.
Dropping the phone	My sister held the phone carefully to measure time.

Processing and analysing data and information:

Predicted order (slowest to fastest)

Shape	Predicted Speed
Flat paper	Slowest
Half fold	Slow
Tri-fold	Medium fast
Accordion fold	Medium fast
Quarter-fold	Fast
Crumpled paper ball	Fastest (prediction: almost fastest)



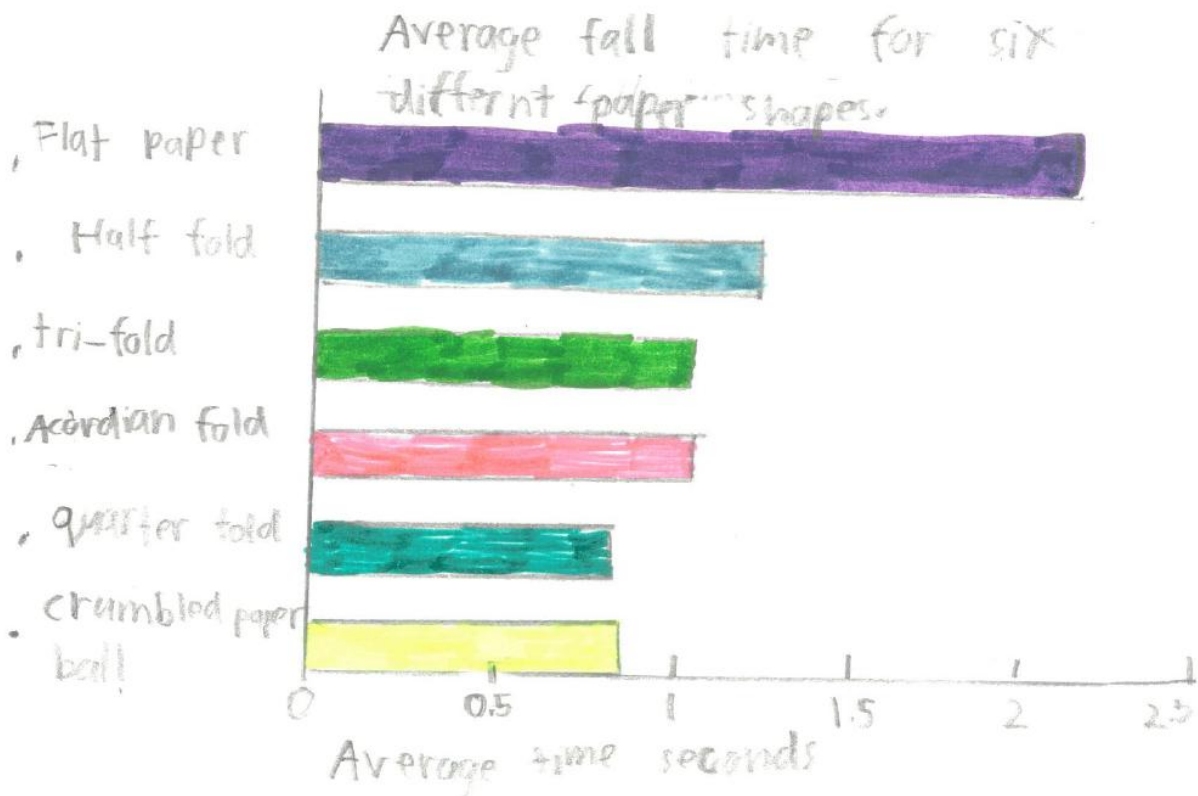
Results

Shape of the paper	Time taken (seconds)					Average Time (seconds)
	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
Flat paper	1.93	2.12	2.19	2.13	2.30	2.13
Half fold	1.13	1.13	1.20	1.33	1.26	1.21
Tri-fold	0.87	1.27	0.94	1.08	0.94	1.02
Accordion fold	0.94	0.88	1.08	1.2	1.01	1.02
Quarter-fold	0.74	0.80	0.68	0.88	0.81	0.78
Crumpled paper ball	0.55	1.14	0.55	1.15	0.55	0.79

Results slowest to fastest

Slowest to fastest	Average time (seconds)
Flat paper	2.13s
Half fold	1.21s
Tri-fold	1.02s
Accordion fold	1.02s
Crumpled paper ball	0.79s
Quarter-fold	0.78 s

Average time taken for each paper shape to reach the ground



The flat paper took the longest time (2.13 seconds) to reach the ground. The quarter-folded paper fell the fastest. The crumpled paper ball was almost as fast. The difference between them was only 0.01 seconds.

The flat paper had the largest surface area, so it caught more air. This meant it had more air resistance and fell more slowly.

The quarter-folded paper and the crumpled paper ball had less surface area exposed to the air. They **caught** less air, so they **had** less air resistance and **fell** faster.

The tri-fold and accordion fold took almost the same time to reach the ground. I think this is because they had a similar surface area and experienced a similar amount of air resistance.

- **Conclusion**

My prediction was almost correct.

I thought the crumpled paper ball would fall the fastest. I was surprised that the quarter-folded paper was a tiny bit faster. The difference was only 0.01 seconds, so both shapes fell at almost the same speed.

My investigation showed that the shape of the paper affects how fast it falls. Smaller paper shapes catch less air and usually fall faster than larger paper shapes.

Evaluating:

- **How could your investigation be improved?**

I could increase the number of trials to make my results more accurate.
I would drop the paper from a higher place.

- **How could your findings be useful to others?**

This investigation helps us learn that the shape of an object changes how fast it falls because of air resistance.

- **What could be further investigated?**

Does a thicker paper fall differently?
What would happen if I did the same investigation on a windy day?

Communicating using scientific terms and methods:

I used a results table, a bar graph and photographs to show my investigation.

I learned new science words like air resistance, surface area and variables by watching science videos and using ChatGPT to help me understand them.

I learned that air resistance is a force that slows down falling objects. Objects with a larger surface area catch more air and fall more slowly. Objects with a smaller surface area catch less air and fall faster.

References

<https://www.youtube.com/watch?v=dxcx35x5L9Y> **Danger! Falling Objects: Crash Course Kids #32.1**

<https://www.youtube.com/watch?v=suQDwZcnJdg> **Gravity | The Dr. Binocs Show | Learn Videos For Kids**

<https://www.youtube.com/watch?v=IP9qwbn6lik&t=19s>

Physics | Force & Motion | Introduction to Air Resistance & Gravity | Science for Kids

<https://www.twinkl.com.au/teaching-wiki/air-resistance>

<https://www.youtube.com/watch?v=5-2NLHB4Gxg> **Work, Force & Energy | What Is Force? | Science For Kids | The Dr Binocs Show | Peekaboo Kidz**

Acknowledgement of AI tools and other support

ChatGPT was used to help me understand air resistance and how to make a bar graph. My dad helped me type my report, check my grammar and keep me safe while I did the experiment. My sister helped me measure the time using a stopwatch. My mum took photos and videos of my investigation.

COVER SHEET

PLEASE UPLOAD THIS COVER SHEET AS A SEPARATE DOCUMENT TO YOUR PROJECT FILE.



Your Electronic Submission Upload Code is: **HER6MGZV**

This will allow your project to be uploaded to our website
(www.oliphantscienceawards.com.au) from 5 June to 28 June 2026.

ID: 0358-007	Mawson Lakes School	
	Coordinator:	Justin Grubb
	School Phone:	08 8260 1681

Student

Diyon Kodithuwakky

Gender

M

Patent: N

505-2638

Year Level: R-2

Group Entry: N

Students: 1

Category: Science Investigation

Keycode: HER6MGZV

Title: Why does crumpled paper fall faster?



My Logbook – Diyon Kodithuwakku

My log book - Diyon kodithuwakku

My Project title:

How does the shape of paper affect how fast it falls?

10 June 2026 my idea

My question:

Which paper shape falls the fastest?

My prediction: I think the crumpled paper ball will fall the fastest because it catches less air.

11 June 2026
my plan

Today I planned my investigation
I made six paper shapes

Flat paper

Half-folded paper

Tri-folded paper

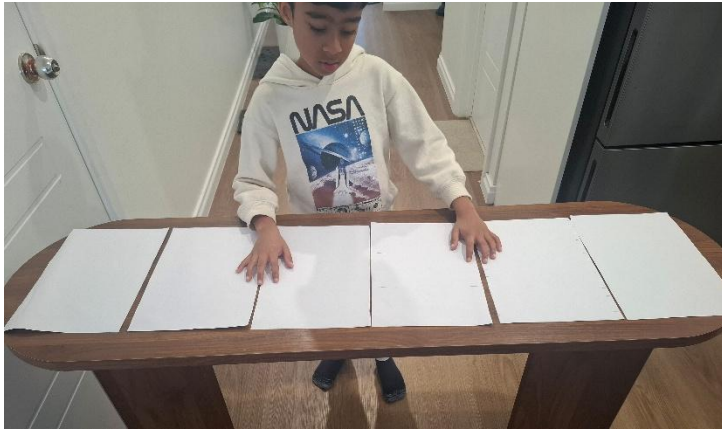
quarter-folded paper

Accordion-folded paper

crumbled paper ball

I decided to:

- use the same size A paper sheets.
- drop them at the same height.
- test each five times
- only changed the shape of the paper



I collected six same-sized papers



Making a crumpled paper ball



Making a tri-folded paper



These are my six shapes

13 June 2026

my investigation

Today I did my investigation.

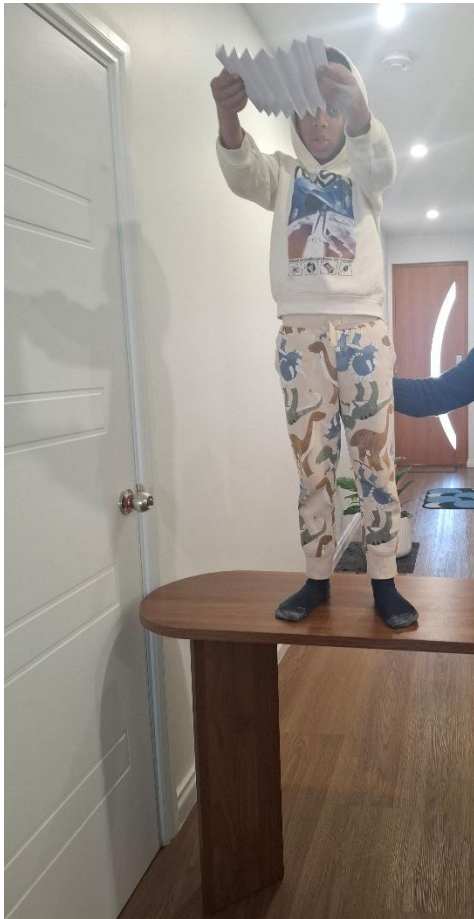
At first I used a chair but it was not high enough. I changed to a sturdy table

so I could drop the papers at a higher place.

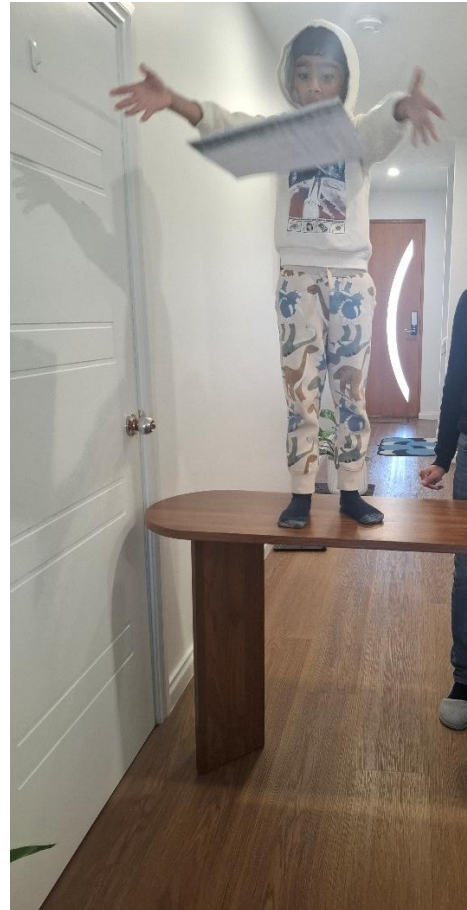
my dad marked the same height with sticky tape.

my sister used a stopwatch to measure the time.

my mum took photos and videos.



Testing accordion fold



Testing flat paper



Testing crumpled paper ball

13 June 2026
my Results

I tested each paper shape five times.
these are my results

	1	2	3	4	5
Flat paper	1.93	2.12	2.19	2.13	2.30
Half fold	1.13	1.13	1.20	1.33	1.26
Tri-fold	0.87	1.27	0.94	1.08	0.94
Acordian fold	0.94	0.88	1.08	1.2	1.01
quarter fold	0.74	0.80	0.68	0.88	0.81
crumpled paper ball	0.55	1.14	0.55	1.15	0.55

14 June 2026

what I found

my dad helped me to calculate the average time for each paper shape

$$\begin{aligned}\text{Flat paper} &= \frac{1.93 + 2.12 + 2.19 + 2.13 + 2.30}{5} \\ &= \frac{10.67}{5} = \underline{\underline{2.13}}\end{aligned}$$

$$\begin{aligned}\text{Half fold} &= \frac{1.13 + 1.13 + 1.20 + 1.33 + 1.26}{5} \\ &= \frac{6.05}{5} = \underline{\underline{1.21}}\end{aligned}$$

$$\begin{aligned}\text{Tri. fold} &= \frac{0.87 + 1.27 + 0.94 + 1.08 + 0.94}{5} \\ &= \frac{5.1}{5} = \underline{\underline{1.02}}\end{aligned}$$

$$\begin{aligned}\text{Accordion fold} &= \frac{0.94 + 0.88 + 1.08 + 1.2 + 1.01}{5} \\ &= \frac{5.11}{5} = \underline{\underline{1.02}}\end{aligned}$$

$$\begin{aligned}\text{Quarter fold} &= \frac{0.74 + 0.80 + 0.68 + 0.88 + 0.81}{5} \\ &= \frac{3.91}{5} = \underline{\underline{0.78}}\end{aligned}$$

$$\begin{aligned}\text{Crumpled paper ball} &= \frac{0.59 + 1.14 + 0.55 + 1.16 + 0.55}{5} \\ &= \frac{3.94}{5} = 0.788 = \underline{\underline{0.79}}\end{aligned}$$

Average fall time

	Average time fall (s)
Flat paper	2.13
Half fold	1.21
Tri-fold	1.02
Acordian fold	1.02
crumbled paper ball	0.79
quarter fold	0.78



I found that:

Flat paper was the slowest.

Quarter-folded paper was the fastest.

The crumpled paper ball was almost as fast as the quarter-folded.

The tri-fold and gordion fold took almost the same time.

15 June 2026
what I learned

I learned that the shape of a paper affects how fast it falls.

I learned new science words

- Air resistance
- surface area
- Variables

next time I would

do more trials

drop the paper from a higher place

test thicker paper

test on a windy day

OSA RISK ASSESSMENT FORM

for all entries in ☒ Models & Inventions and ☐ Scientific Inquiry

This must be included with your report, log book or entry. One form per entry.

STUDENT(S) NAME: Diyon Kodithuwakku ID: 0358-007

SCHOOL: Mawson Lakes School

Activity: Give a brief outline of what you are planning to do.

I am going to find out how the shape of paper affects how fast it falls. I will make different paper shapes using the same size paper. I will drop them from the same height and measure how long they take to reach the ground. I want to find out which paper shape falls the fastest.

Are there possible risks? Consider the following:

- Chemical risks: Are you using chemicals? If so, check with your teacher that any chemicals to be used are on the approved list for schools. Check the safety requirements for their use, such as eye protection and eyewash facilities, availability of running water, use of gloves, a well-ventilated area or fume cupboard.
- Thermal risks: Are you heating things? Could you be burnt?
- Biological risks: Are you working with micro-organisms such as mould and bacteria?
- Sharps risks: Are you cutting things, and is there a risk of injury from sharp objects?
- Electrical risks: Are you using mains (240 volt) electricity? How will you make sure that this is safe? Could you use a battery instead?
- Radiation risks: Does your entry use potentially harmful radiation such as UV or lasers?
- Other hazards.

Also, if you are using other people as subjects in an investigation you must get them to sign a note consenting to be part of your experiment.

Risks	How I will control/manage the risk
- Paper cuts - Falling from a chair - Tripping over objects - Dropping the phone	Handle the paper carefully Have parent supervision and help Keep the floor clear Hold the phone carefully

(Attach another sheet if needed.)

Risk Assessment indicates that this activity can be safely carried out

RISK ASSESSMENT COMPLETED BY (student name(s)): Diyon Kodithuwakku

SIGNATURE(S): Diyon

☒ By ticking this box, I/we state that my/our project adheres to the listed criteria for this Category.

TEACHER'S NAME: Justin Groll

SIGNATURE: J Groll DATE: 22/6/26