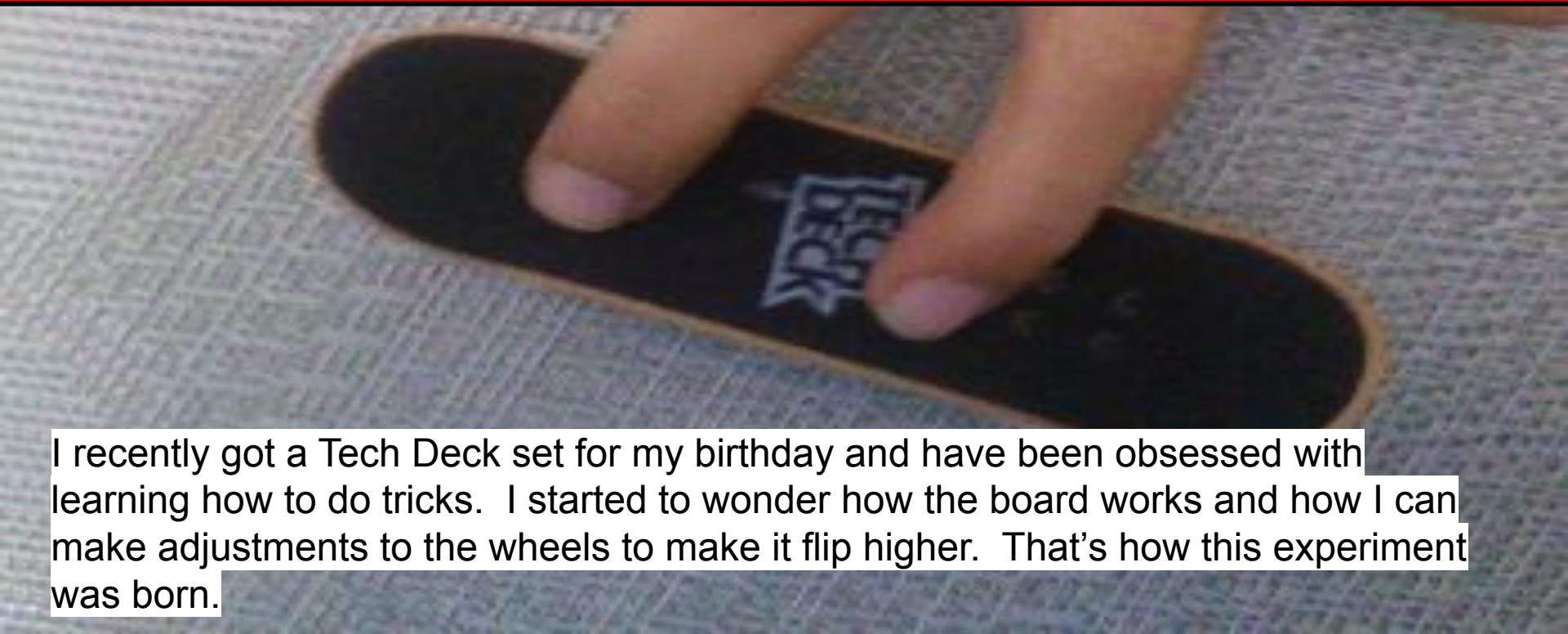
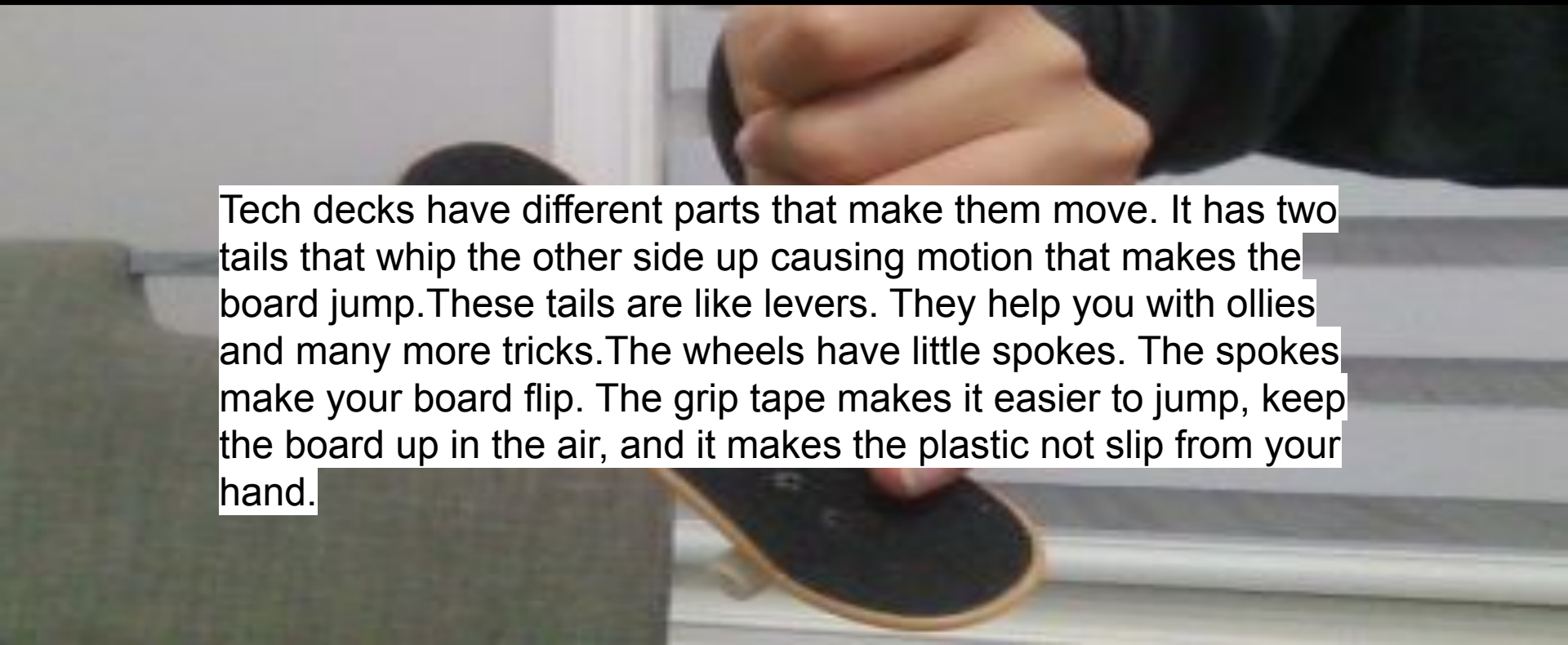
Tech Decks



I recently got a Tech Deck set for my birthday and have been obsessed with learning how to do tricks. I started to wonder how the board works and how I can make adjustments to the wheels to make it flip higher. That's how this experiment was born.

Parts



Tech decks have different parts that make them move. It has two tails that whip the other side up causing motion that makes the board jump.These tails are like levers. They help you with ollies and many more tricks.The wheels have little spokes. The spokes make your board flip. The grip tape makes it easier to jump, keep the board up in the air, and it makes the plastic not slip from your hand.

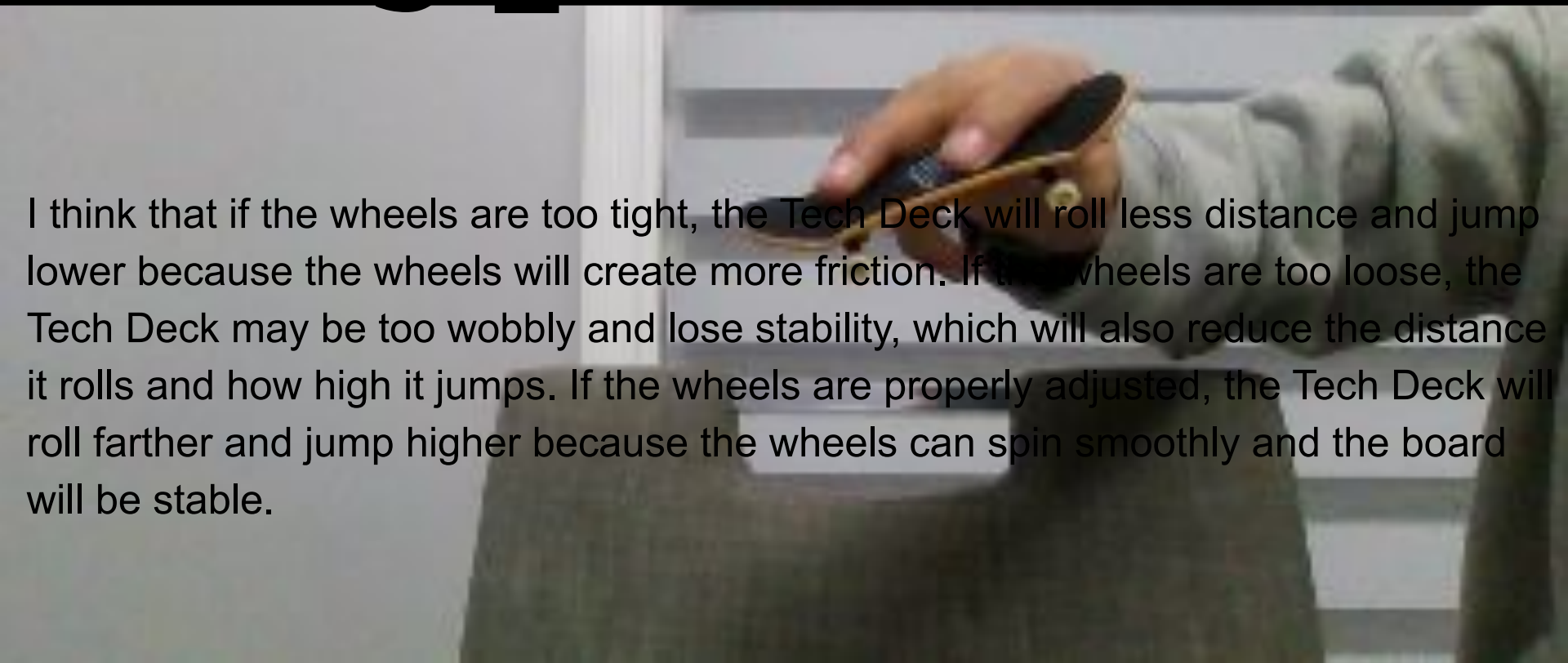
Ramps

Tech Decks have created different kinds of ramps. These ramps help people do many kinds of tricks. These tricks include Ollies, kickflips, shuvits, 50-50 grinds, 360 flips, and footstomps.

Physics

The physics behind tech decks are simple. Friction builds up on the wheels making the board jump. But if you build up to much momentum a bolt might unscrew and the board could break.

Hypothesis



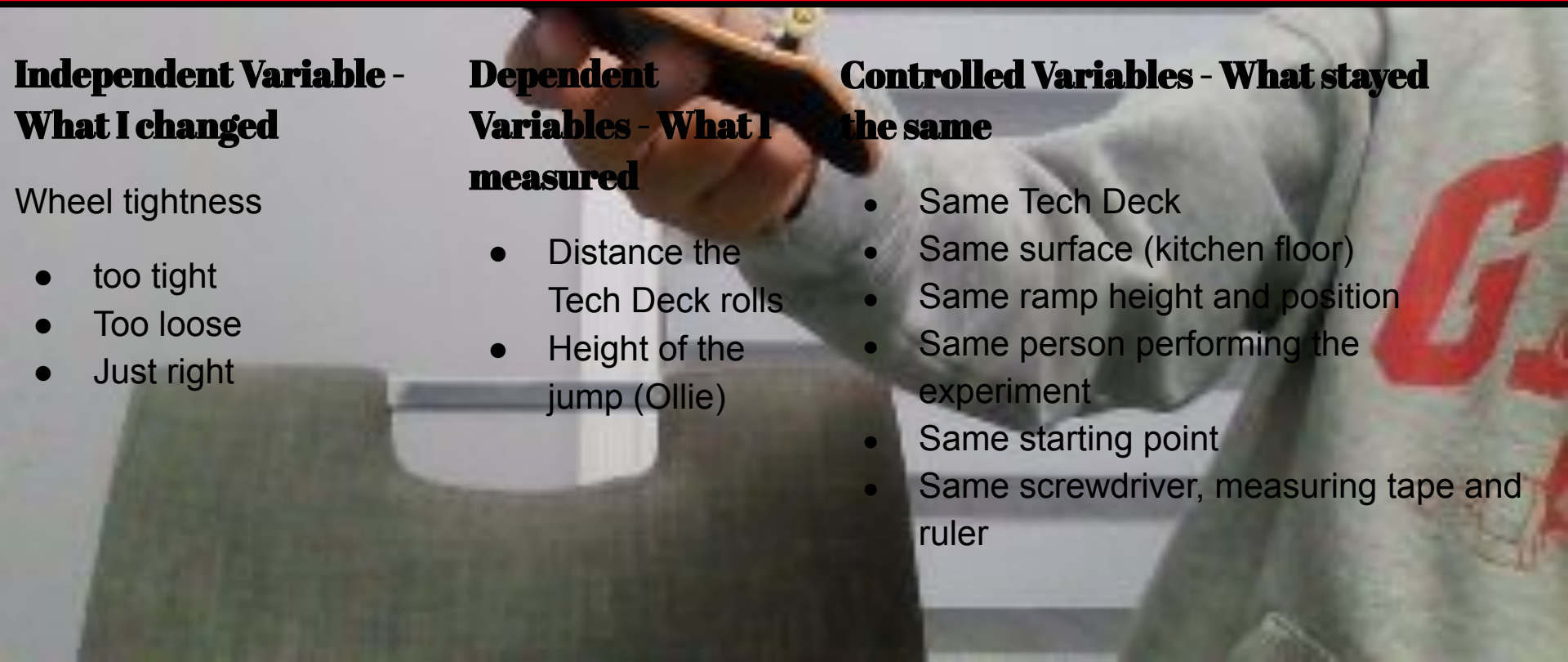
I think that if the wheels are too tight, the Tech Deck will roll less distance and jump lower because the wheels will create more friction. If the wheels are too loose, the Tech Deck may be too wobbly and lose stability, which will also reduce the distance it rolls and how high it jumps. If the wheels are properly adjusted, the Tech Deck will roll farther and jump higher because the wheels can spin smoothly and the board will be stable.

Research

- A Tech Deck is a miniature skateboard that works similarly to a real skateboard, but is controlled by your fingers instead of your feet. It has a deck, trucks, and wheels. The wheels spin on small metal parts called axles.
- One important idea in science is friction. Friction happens when two surfaces rub against each other. Friction can slow things down.
- If the wheels on a Tech Deck are too tight, they can't spin easily. This creates more friction and can slow the skateboard down.
- If the wheels are too loose, the board can wobble and become unstable. This may affect how well the board rolls or jumps.

In this experiment, I tested how different wheel tightness affects how far a Tech Deck rolls and how high it jumps.

Variables



Independent Variable - What I changed

Wheel tightness

- too tight
- Too loose
- Just right

Dependent Variables - What I measured

- Distance the Tech Deck rolls
- Height of the jump (Ollie)

Controlled Variables - What stayed the same

- Same Tech Deck
- Same surface (kitchen floor)
- Same ramp height and position
- Same person performing the experiment
- Same starting point
- Same screwdriver, measuring tape and ruler

Procedure

Part 1: Rolling Distance

1. Tighten the wheels very tight to create the most friction and stability.
2. Place the Tech Deck at the top and center of the ramp.
3. Let the Tech Deck go from the top of the ramp.
4. Measure how far it rolls.
5. Repeat 5 times and record the distance.
6. Adjust the wheels to just right so they spin freely but don't wobble.
7. Repeat the experiment 5 times and record the distance.
8. Loosen the wheels very loose so they wobble.
9. Repeat the experiment 5 times and record the distance.

Part 2: Jump Height

1. Perform an Ollie on t
2. Measure how high th
   jumps using a ruler.
3. Do 5 trials for each w
   1. Too tight
   2. Just right
   3. Too loose

Observations

- I noticed that when the wheels were too tight, the Tech Deck did not roll very far.
- The board stopped quickly when the wheels were tight.
- When the wheels were too loose, the board wobbled from side to side.
- The Tech Deck moved smoothly when the wheels were just right.
- The highest jumps happened when the wheels were just right.

Analysis

My results showed that wheel tightness affects how the Tech Deck moves.

- When the wheels were too tight, they could not spin easily. This created more friction and slowed the board down.
- As a result, when the wheels were too tight, the board only moved forward an average of 35 cm and jumped only 12 cm high.
- When the wheels were too loose, the wheels wobbled and became less stable.
- As a result, when the wheels were too loose, the board moved forward an average of 52 cm and jumped 20 cm high.
- The best results happened when the wheels were adjusted just right because the wheels could spin smoothly and the board stayed balanced. This helped the Tech Deck roll farther and jump higher.
- As a result, when the wheels were adjusted just right, the board moved forward an average of 69 cm and jumped 40 cm high.

This experiment shows that friction and stability affect motion.

Data

Wheel Tightness	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Average
Too tight - distance rolled	37cm	38cm	32cm	39cm	30cm	35cm
Too tight - jump height	12cm	14cm	10cm	13cm	11cm	12cm
Just right- distance rolled	58cm	70cm	69cm	72cm	78cm	69cm
Just right- jump height	41cm	36cm	40cm	44cm	37cm	40cm
Too loose- distance rolled	46cm	50cm	53cm	59cm	50cm	52cm
Too loose- jump height	22cm	24cm	25cm	17cm	14cm	20cm

Graph

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Too loose- jump height	22cm	24cm	25cm	17cm	14cm	20cm

Conclusion

- The purpose of my experiment was to find out how wheel tightness affects how a Tech Deck moves and jumps.
- My results showed that the Tech Deck worked best when the wheels were tight enough to spin smoothly but not loose enough to wobble.
- When the wheels were too tight, they did not spin easily. This created more friction and made the board roll a shorter distance and jump lower.
- When the wheels were too loose, the board became wobbly and did not move as far or high.
- The best results happened when the wheels were just right. The board rolled farther and jumped higher because the wheels could spin smoothly and the board stayed balanced.
- This experiment shows that wheel tightness and friction affect how skateboards move.

Application

This experiment relates to real skateboards and other things with wheels.

- Skateboarders adjust their wheels so they spin smoothly.
- Bike wheels also need to spin freely so the bike can move easily.
- Cars and other vehicles work better when their wheels turn smoothly.

This shows that having wheels adjusted properly helps things move better and more efficiently.

Sources of Error

Things that may have affected my results:

- The drop from the ramp may not have been exactly the same each time.
- The ramp angle may have changed slighlty.
- Measuring the jump height by eye may not be the most accurate.
- The floor surface may not have been totally smooth.
- The wheel tightness may not have been adjusted the exact same each time.

Citations

Tech Deck website for product information Tech Deck | Home

Youtube videos on Tech Deck tricks like the Ollie How To Ollie On A Fingerboard

What is Friction | Types of Friction | Science for Kids

Science Buddies "What is Friction" https://www.sciencebuddies.org/

Acknowledgements

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- My teacher for guiding me with my science fair project.
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