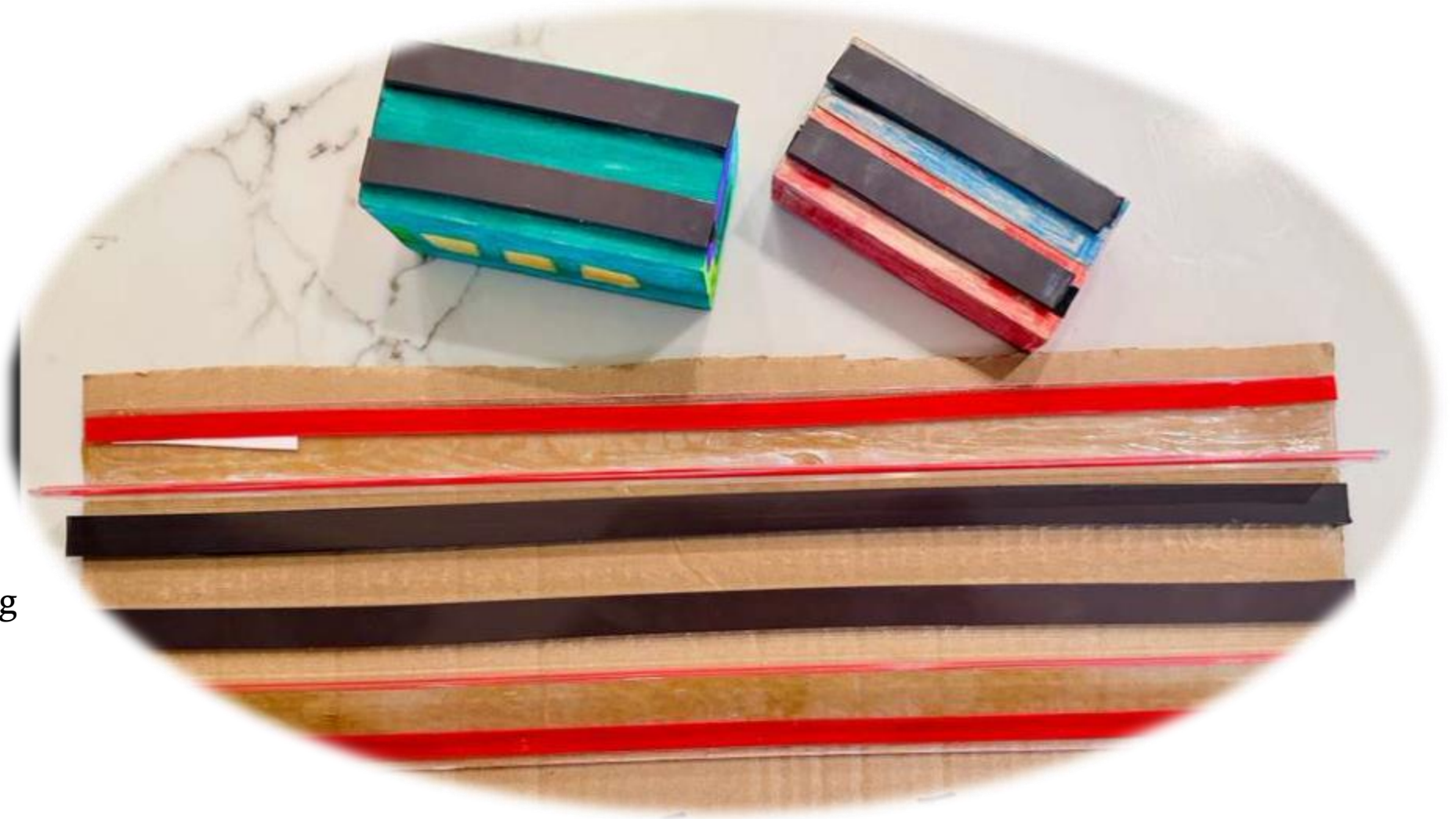

THE FLOATING TRAIN



Category: Engineering

Grade 2

MOTIVATION

This experiment is inspired by real-world maglev trains. In the real world, maglev trains float on magnets too, which helps them go extremely fast without touching the tracks. Lighter trains or lighter parts can move more easily and travel farther or faster than heavier parts which is what I tested in my experiment.

QUESTION?

Can magnets make a train move without touching the tracks, and does a train's weight decide how far it will go?

HYPOTHESES I TESTED

Hypothesis 1:

I think my train will float with magnets because the magnets will push away from each other when the same sides will face each other .

Hypothesis 2:

I think the lighter train will go farther than the heavier train because it weighs less.

INTRODUCTION

I chose this project because I think trains are interesting. In my experiment, I will test how a train moves on a magnetic track. My project is important because it will help people learn about the magnetic force and how weight affects the magnetic push and pull.

MATERIALS

- Cardboard
- Magnetic tape
- Wooden blocks
- Plastic guide rails
- Colored pencils
- Weighing scale
- Markers
- Scissors
- Glue
- Ruler



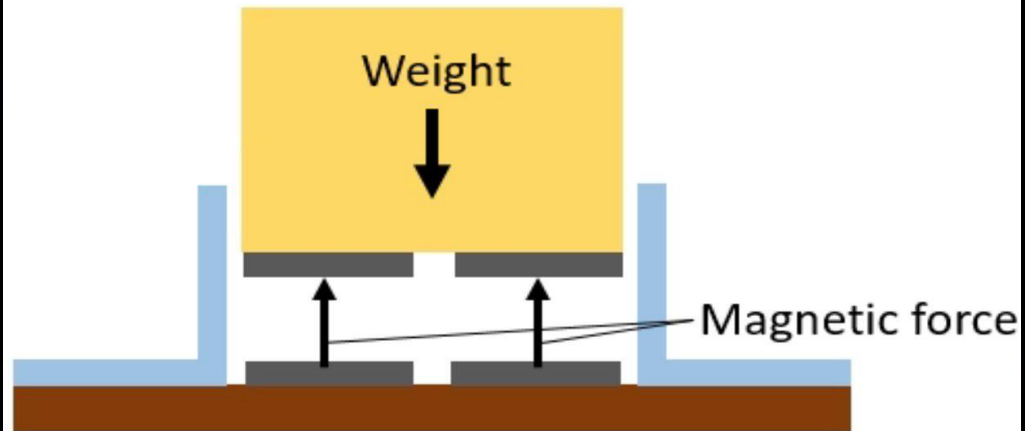
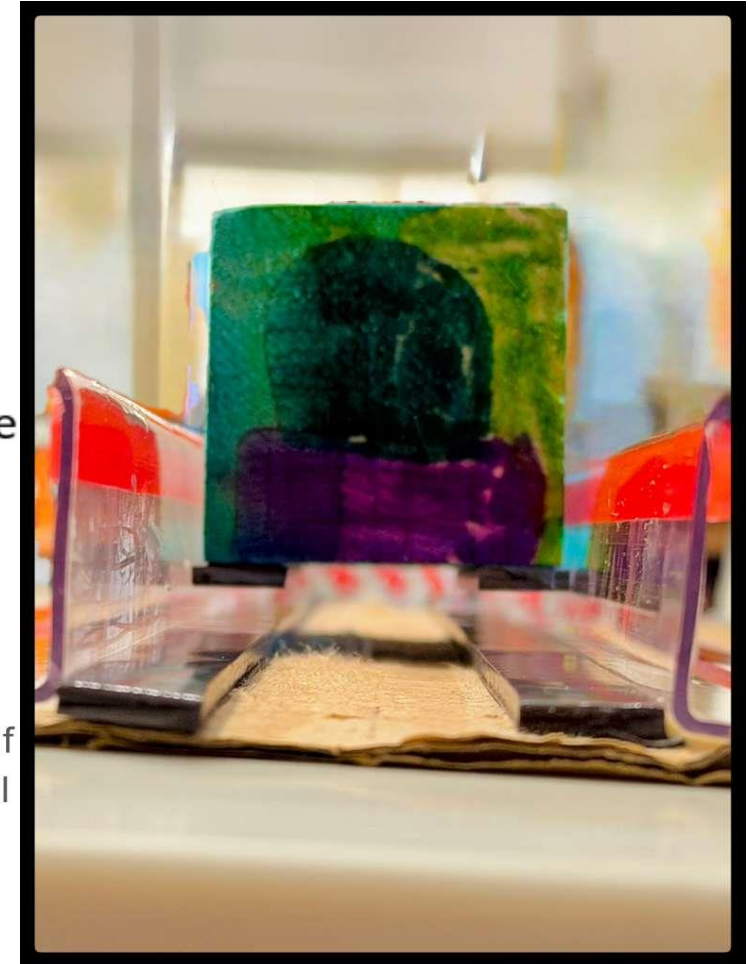


Image Credit: [Ben Finio, Science Buddies / Science Buddies](#)

Figure 1. A cross-sectional diagram of the maglev train.

The train has two magnets on the bottom of it. These magnets push against two magnets that form the tracks. If the force from the magnets is strong enough, the train will float in the air above the tracks.

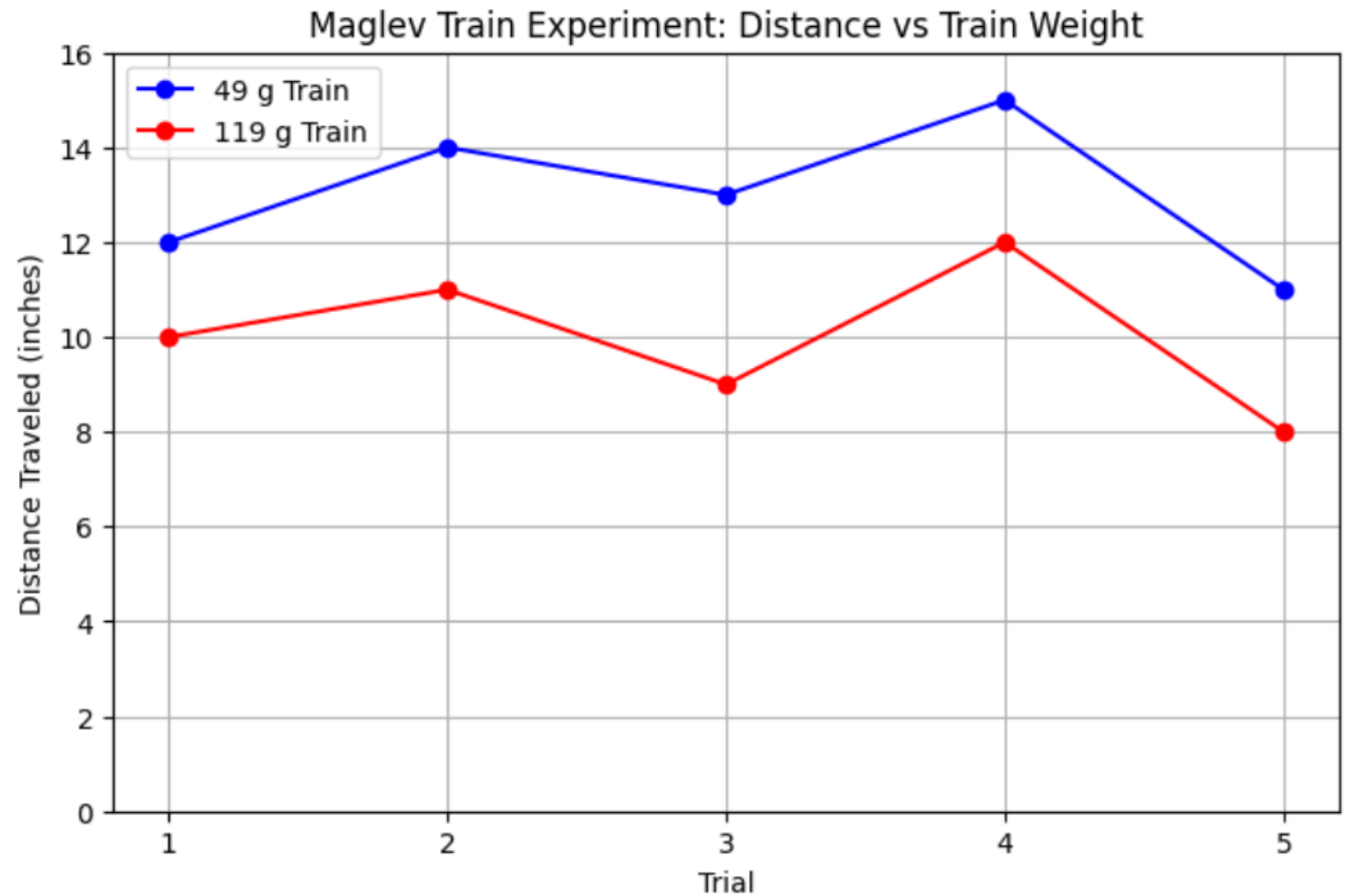
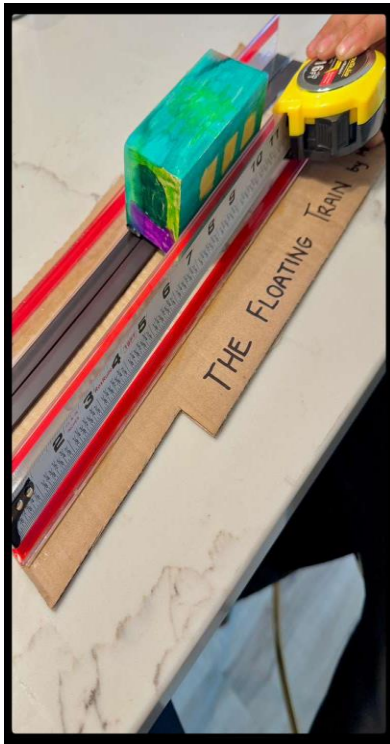
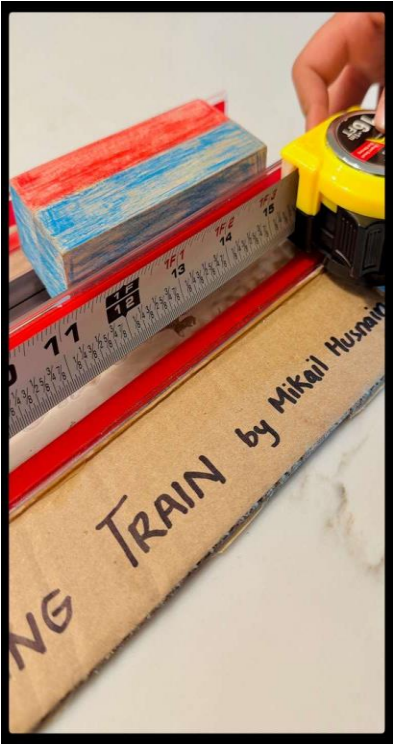


PROCEDURE

- I got the materials for my project and made 2 trains using different sized wooden blocks and weighed and colored them.
- I cut up some cardboard to make my tracks and used glue to stick the guide rails to the cardboard.
- Then I put the magnetic tape with same poles on the trains and the tracks and confirmed that they were repelling each other and my trains were floating.
- Next, I pushed both my lighter and heavier train multiple times to see which one would go farther.
- I calculated the distance both trains travelled and made a graph and wrote down all my observations in my science journal.



COMPARING DISTANCE TRAVELLED BY BOTH TRAINS



I carried out the experiment with both the trains 5 times and recorded how far each train would go every time and made a table recording my observations.

Trial	49 g Train (inches)	119 g Train (inches)
1	12	10
2	14	11
3	13	9
4	15	12
5	11	8

RESULTS

I observed that both my trains floated on the magnetic tracks. I pushed both the trains on the tracks and noted that every time I conducted the experiment, the lighter train would go farther than the heavier train.

CONCLUSION

I thought both trains would float on the track, and the lighter train would go farther. The experiment showed that my hypothesis was correct. Both trains floated because the magnets on the train and the tracks repelled each other and lifted the trains off the track. The lighter train went farther than the heavier train because it was easier for it to move and didn't have as much weight to slow it down.

IMPROVEMENTS

- I would like to conduct this experiment with more trains of different weights to have more information to strengthen my results.
 - I would also like to ensure I could apply the same amount of force every time I push the train.
-

THANK YOU
