

# Weight vs. wheels

4th grade



VS



## Testable Question:

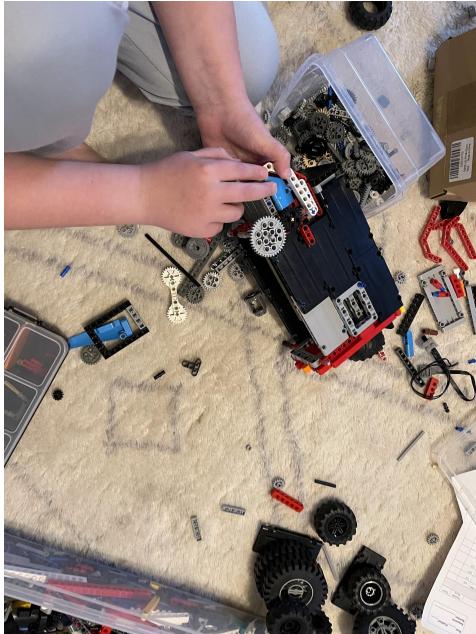
How does the weight and size of the wheels affect a car's speed?

## Prediction:

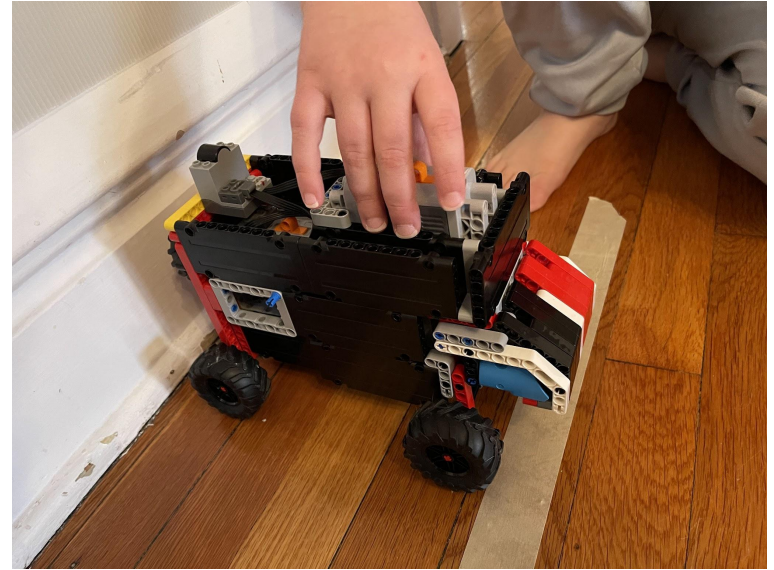
I think that the bigger wheels will make the car faster because the smaller wheels take more rotations to move the same distance. However I think the weight will make it have slower acceleration.

# Procedure

## 1. I built the basic model



## 2. Heavy car = Basic + Battery Pack

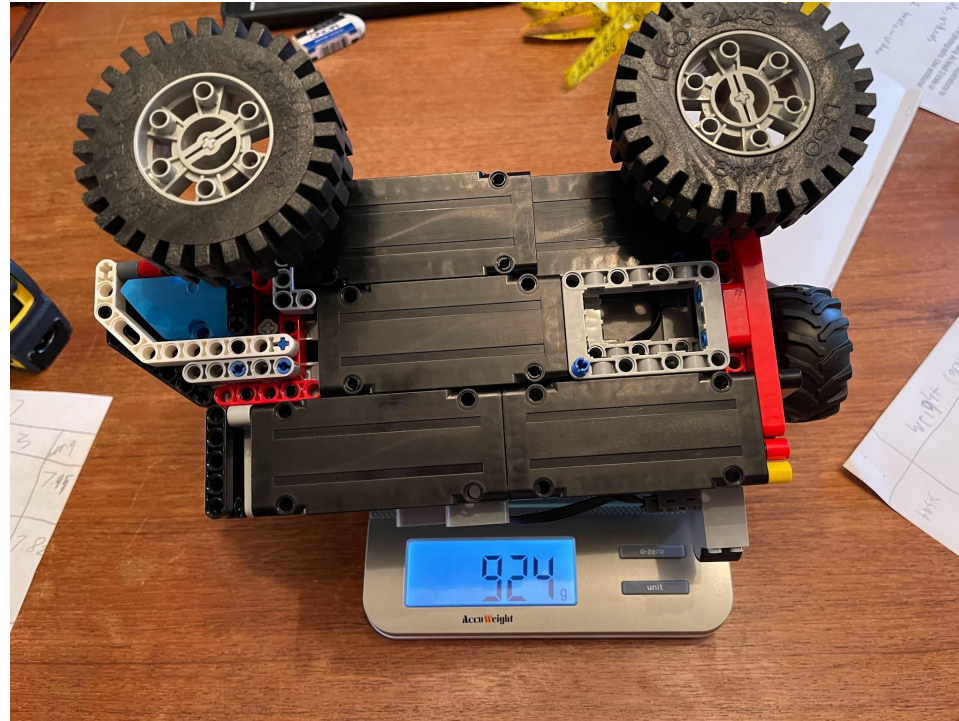




### 3. Big Wheels car = Basic + Bigger Wheels



## 4.I weighed the cars and recorded my data



5. I took the circumference of the wheels and recorded my data



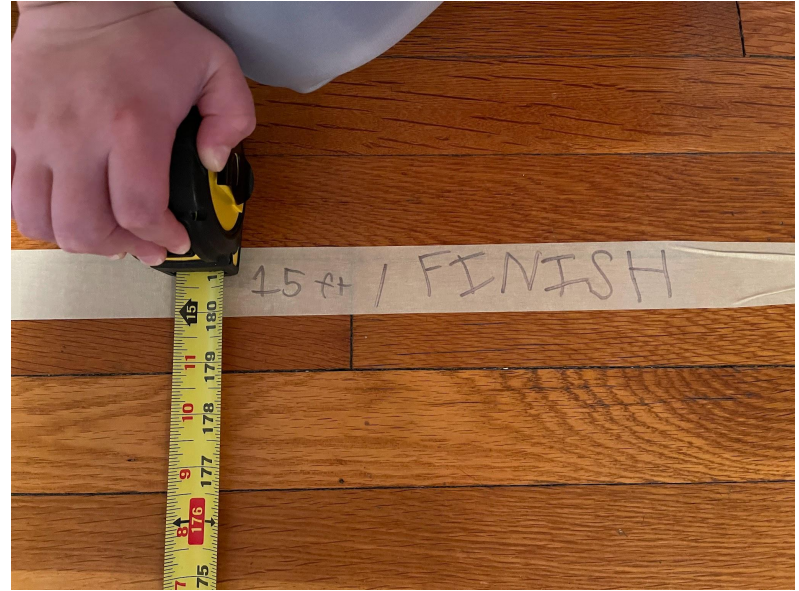
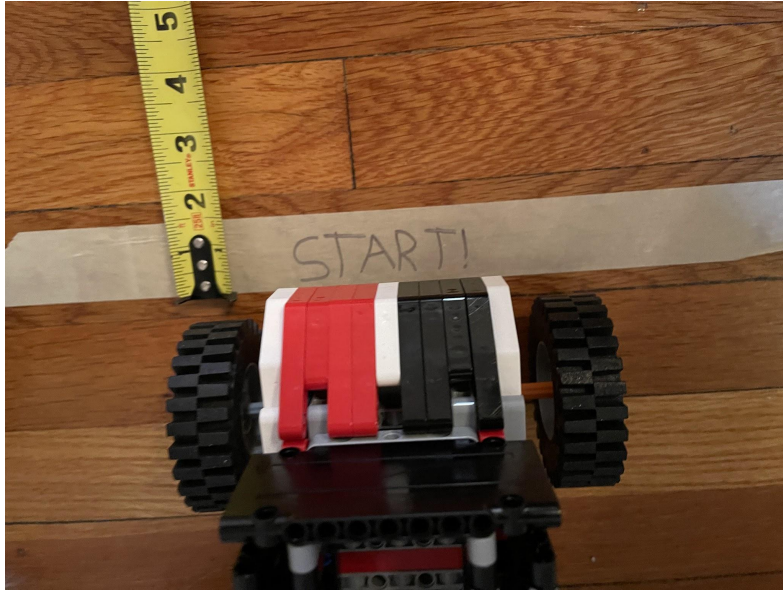
## 6. I put my data on this chart

Note big wheels weight is only 924 because the wheels weigh more ■

Car type	Weight (grams)	Wheel circumference ( cm)
basic	800	18
Heavy weight	1024	18
Big wheels	924	26



## 7. I made a start and finish line for my cars



## 8. I raced my car and recorded my data



# Background

I chose this project because I really like building lego cars and then racing them and that's basically what my project is.

In my research I found out that:

- Speed equals distance over time  $s=d/t$
- Wheel speed is measured in rpm's or revolutions per minute
- Extra weight slows exceleration

This project is important because it can help humanity convert to fuel efficient vehicles with bigger wheels therefore slowing down global warming.

# Constant Conditions:

Independent Variable: the weight or the size of the wheels

Dependent Variable: the time it takes go 3 meters

Constant Conditions: the base and the weight or the size of the wheels

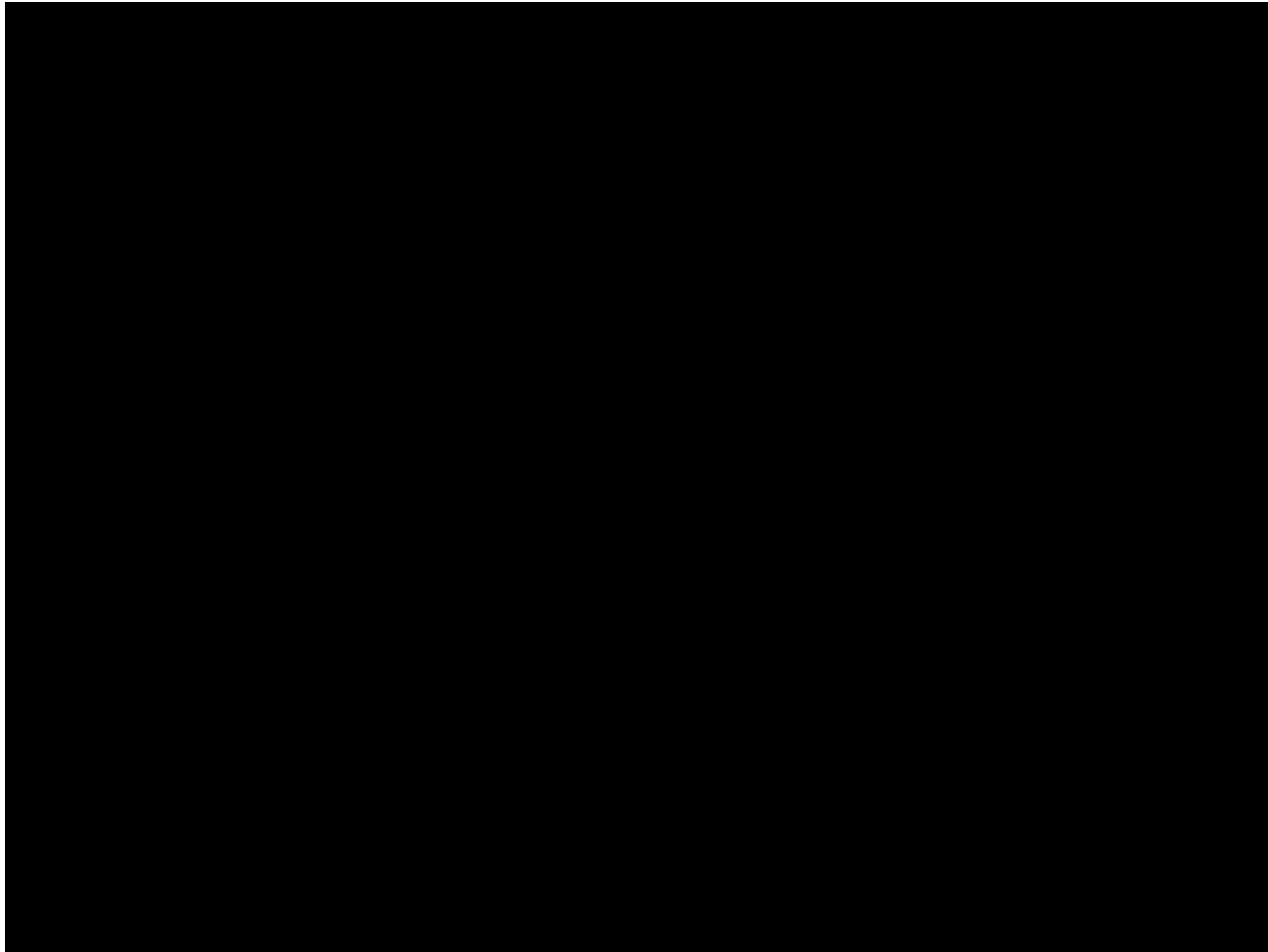


Data:

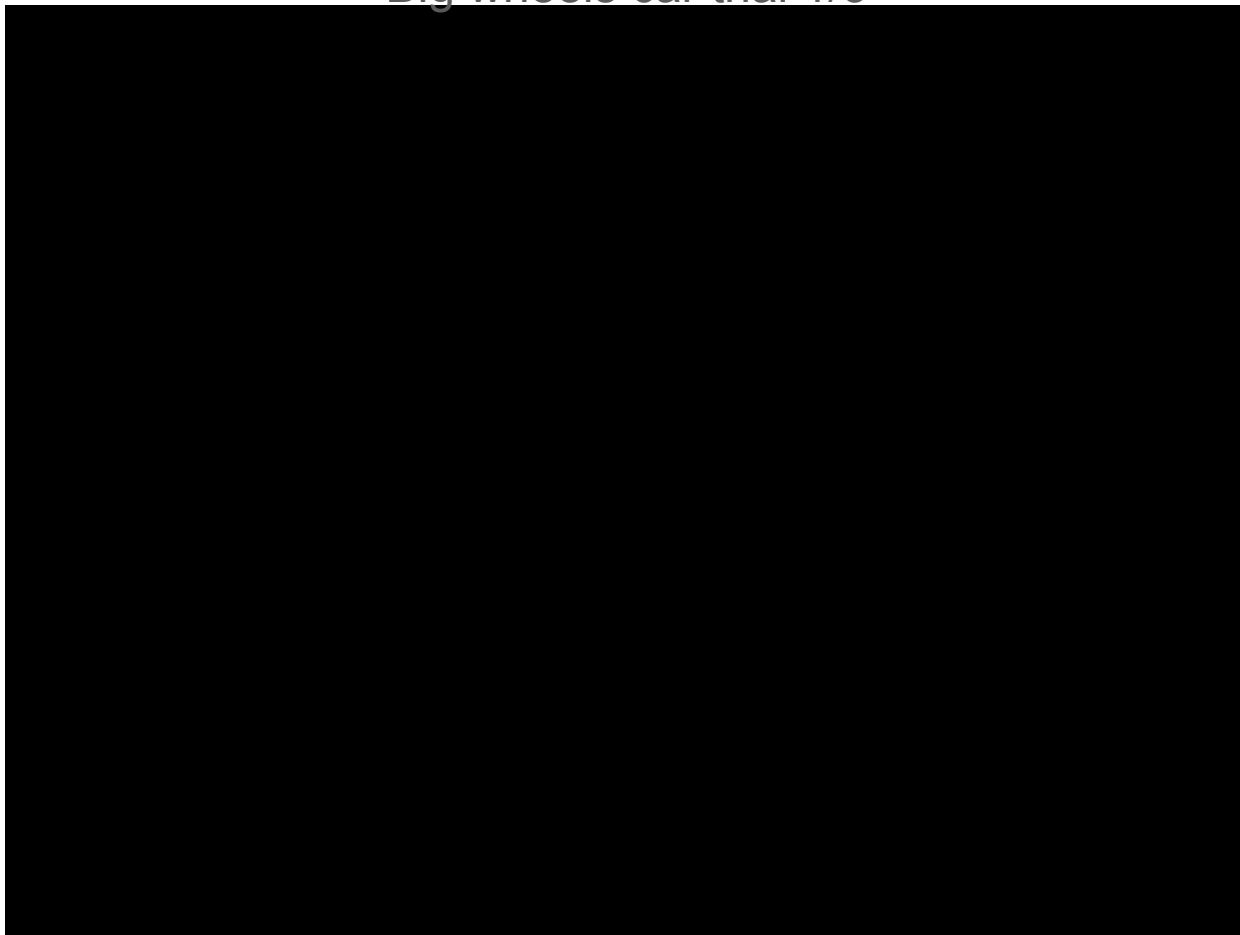
Basic model test 1/3



Data:



Data:



Data:

		Speed of Cars (seconds)			
		Trial 1	Trial 2	Trial 3	Average
Type of Car	basic	7.58	7.26	7.50	7.45
	Heavy weight	7.68	7.96	7.81	7.82
	Big wheels	6.23	6.00	6.13	6.12



## Conclusion and Reflection:

I found out that my hypothesis was right greater wheel size was faster and greater weight made it slower.

I was surprised that weight had such a negative affect i thought it would make up for it in momentum.

If I did this project again i'd use a longer race track so i could learn about momentum

# Bibliography:

“Speed.” *Encyclopædia Britannica*, Encyclopædia Britannica, inc., kids.britannica.com/. Accessed 22 Jan. 2024.

Name. “Weight Has No Effect on Your Car’s Top Speed!: Know It All with Jason Cammisa: EP. 09.” *Hagerty Media*, [www.hagerty.com/media/videos/weight-has-no-effect-on-your-cars-top-speed-know-it-all-with-jason-cammisa-ep-09/#:~:text=Adding%20extra%20weight%20to%20your,rolling%20resistance%20and%20aerodynamic%20drag](http://www.hagerty.com/media/videos/weight-has-no-effect-on-your-cars-top-speed-know-it-all-with-jason-cammisa-ep-09/#:~:text=Adding%20extra%20weight%20to%20your,rolling%20resistance%20and%20aerodynamic%20drag). Accessed 22 Jan. 2024.

Markings, Samuel. “How to Calculate Wheel Speed.” *Sciencing*, 2 Mar. 2019, [sciencing.com/calculate-wheel-speed-7448165.html](http://sciencing.com/calculate-wheel-speed-7448165.html).