



The Great Hot Wheels Race!

2026 Science
Fair



Background Information

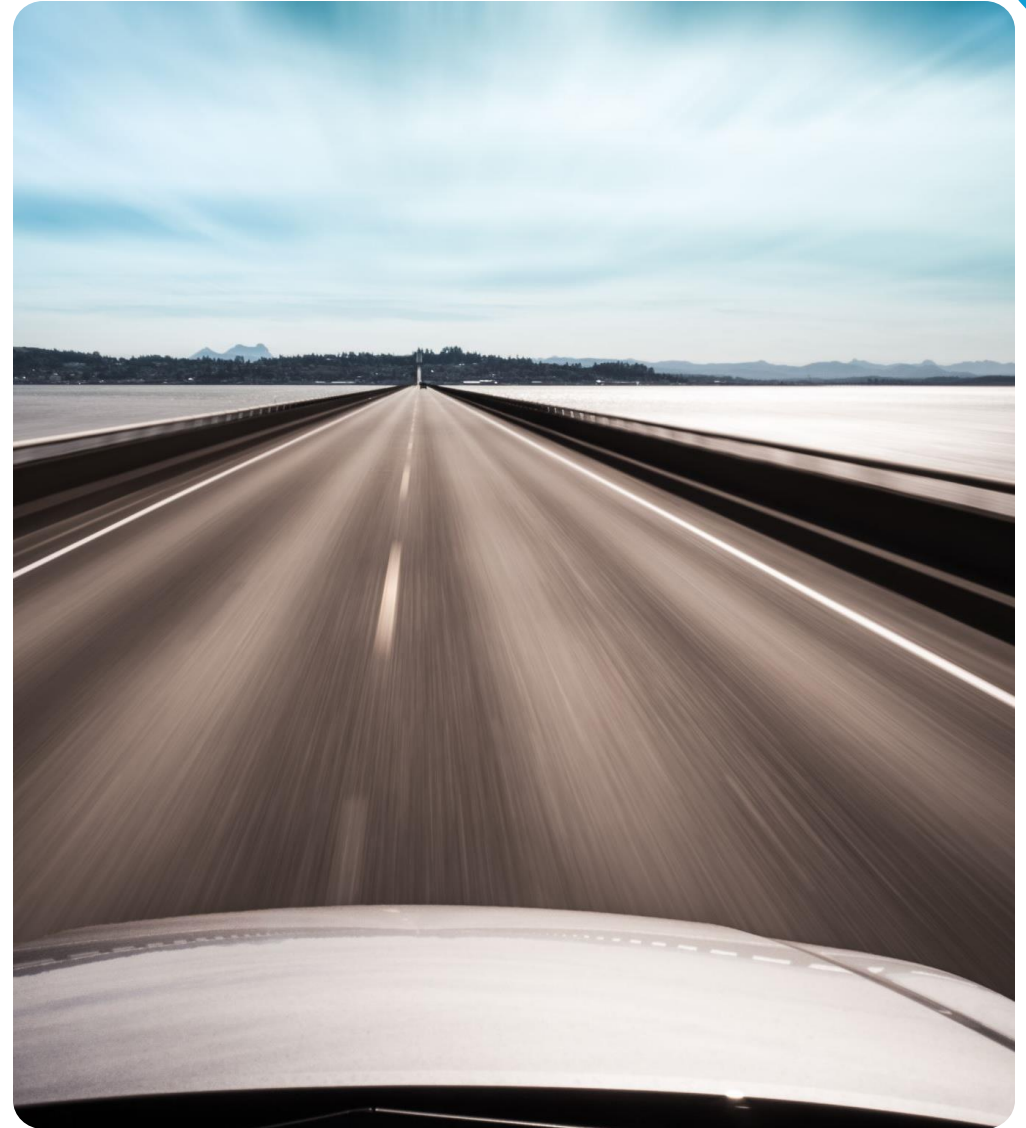
- We love playing with hot wheels during play to learn time. When we were playing, we noticed the car would stop or slow down a lot when it was on the carpet and go faster on the tile or track.
- We wanted to know:
How does the texture of the track affect how fast the car goes?

Research

- Smooth things can help objects move faster.
- Rough things can slow objects down.
- Slippery surfaces can make things slide.
- Bumpy roads can make cars shake and lose speed.

We read books and watched videos about how real cars drive on different roads like dirt, ice, and pavement. We learned a new word: **friction**. Friction is what happens when two things rub together. More friction can make things go slower. Less friction can make things go faster.

We are excited to see what happens with our car.



the hypothesis is
(our) the car will
go the
fastest

only the

Plain III
frozen IIII

Sloist

Plain II

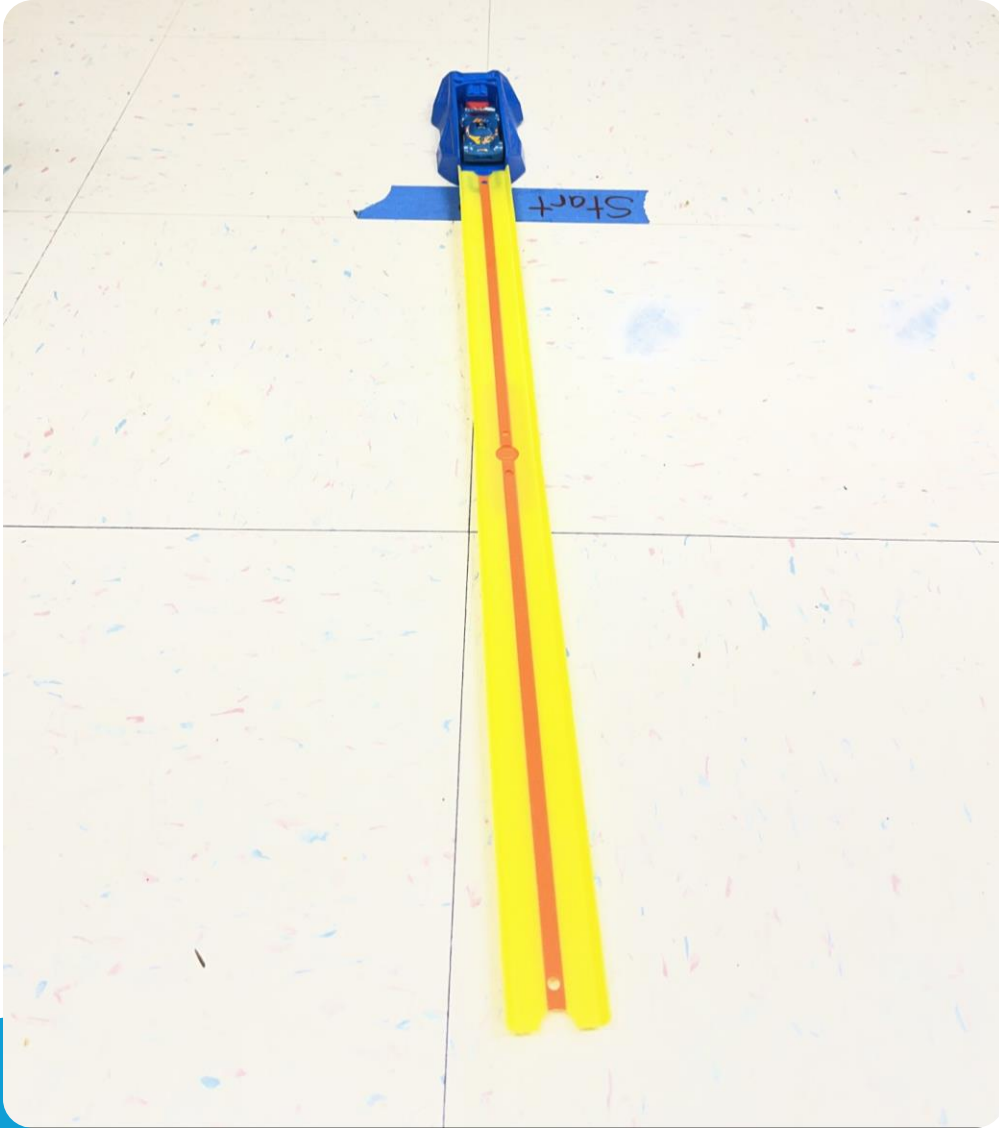
oily III
frozen IIII

dirt O

dirt IIII

Hypothesis

- Most of us thought the car would go the fastest on the frozen track because we slip on ice.
- We also think the car will go the slowest on the dirt track because it is way more stuff on it.



Materials

- Hot Wheels car
- Hot Wheels launcher
- 8 12" Hot Wheels track
 - Plain track (control)
 - Sand and dirt for another track
 - Water and a freezer for the frozen track
 - Canola oil for the oily track
- Tape to mark start and end
- Timer
- Recording sheet

Procedures

We said we had to keep the car and the launcher the same so we would be measuring the same starts and what the car did.

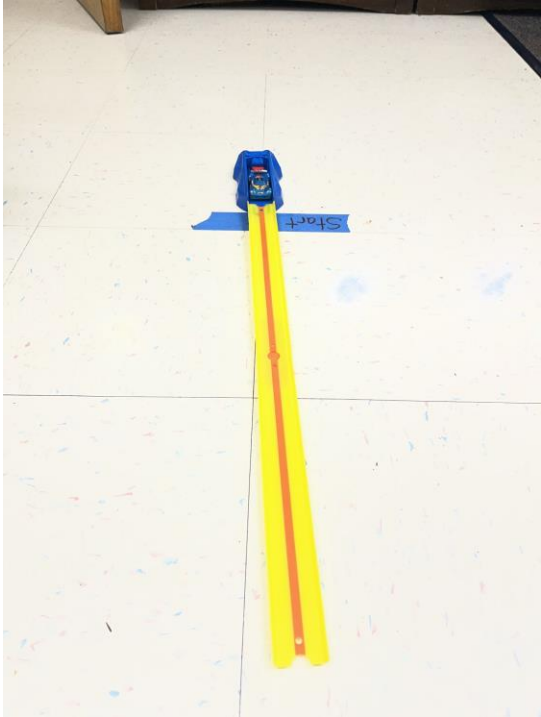
Using Hot Wheel Tracks build four different tracks:

- A plain track
- Sprinkle sand and dirt from the playground to cover a track
- Pour water and put a track in the freezer to make a frozen track
- Pour canola oil to cover a track to make an oily track

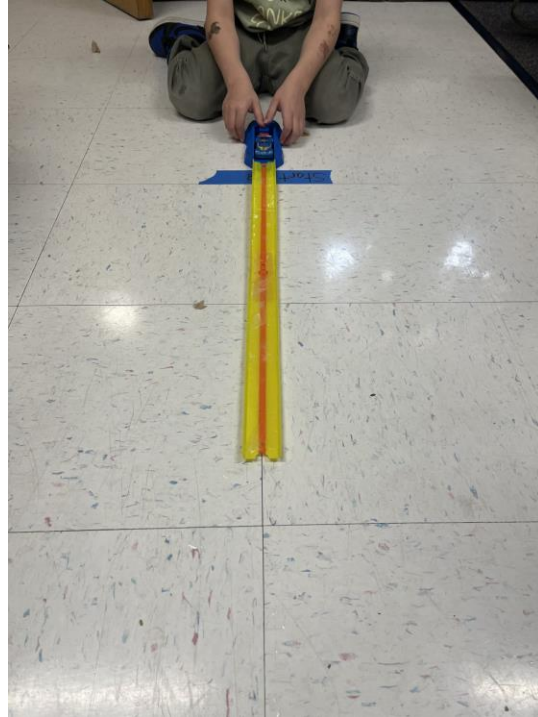
Steps:

- Put down tape for a start line and 14 feet later put down another piece of tape for the finish line.
- Attach the plain track to the launcher.
- Put the car in the launcher and line it up to the start line.
- Push the launcher button.
- Time how long it takes for the car to reach the end or when it stops.
- Record the time.
- Repeat five times.
- Do everything again for each track be sure to change out the track to get times for the frozen, dirt, and oily tracks. Put paper down under the track for the dirt and oily tracks to keep the floor cleaner.

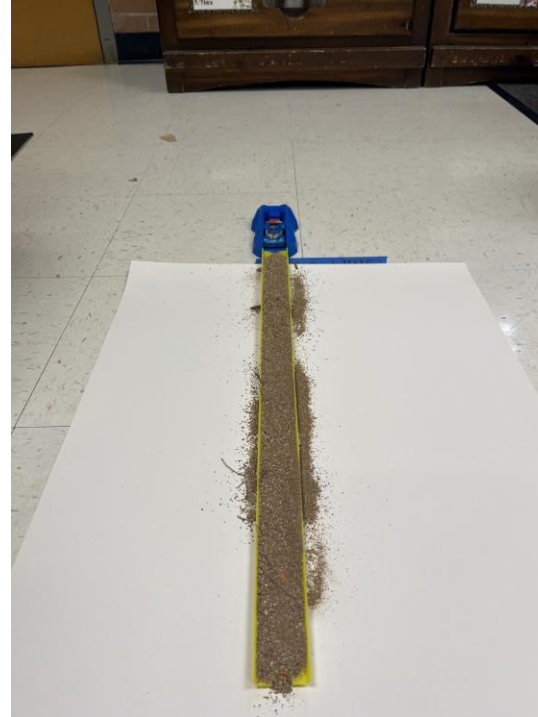
Plain



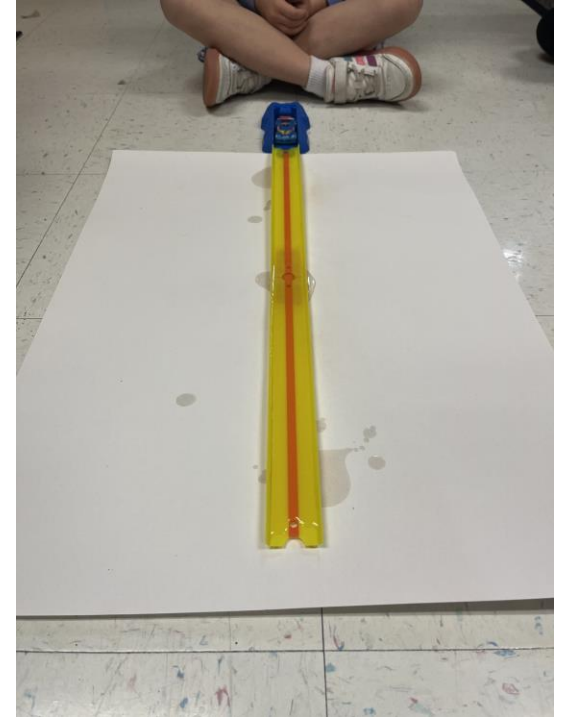
Frozen



Dirt



Oily



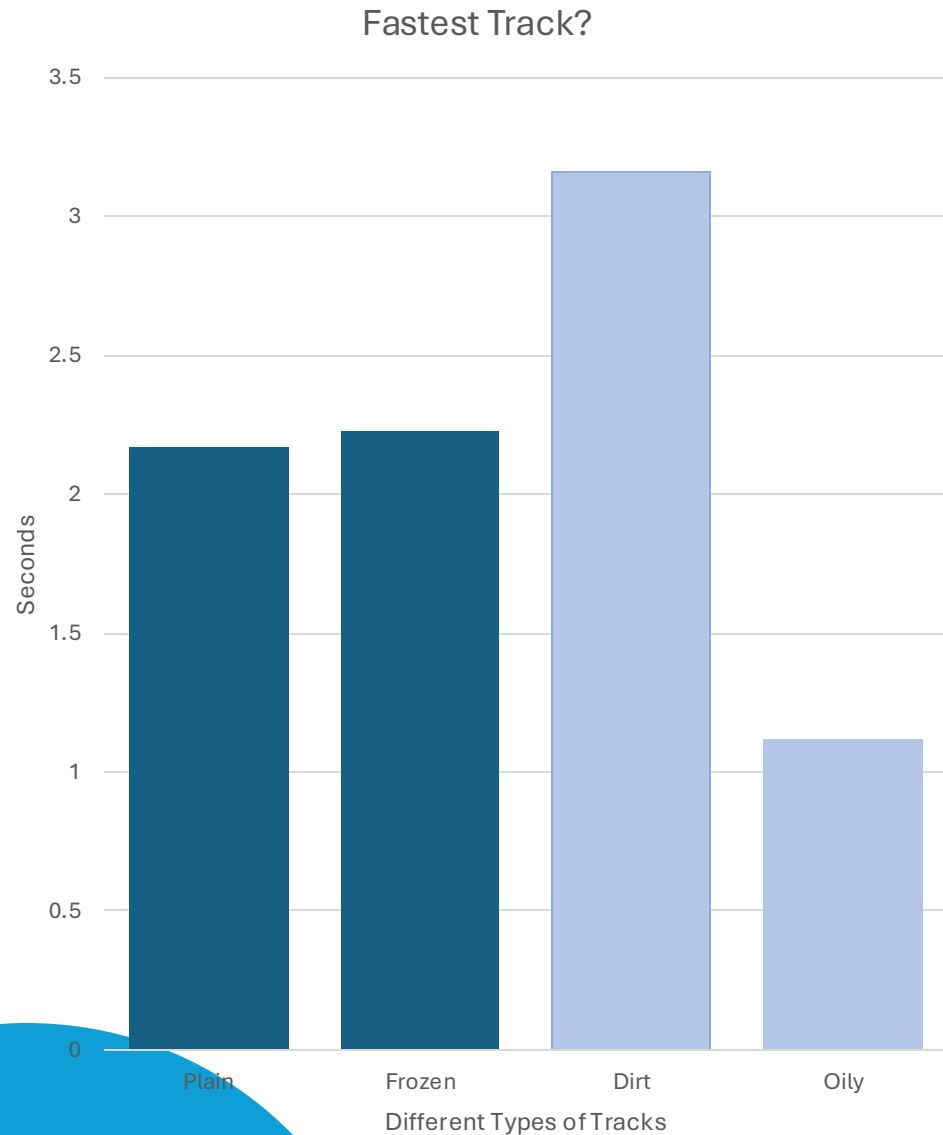
Results

- The plain track was the fastest track.
- The frozen track was slippery, and the car went fast but not as fast as the plain track.
- The car made it off the dirt track, but it didn't make it to the finish line because it was so much slower because it was bumpy.
- The car didn't make it off the oily track. It got stuck on the track.
- The smoother the track, the faster the car went.
- The rougher the track, the slower the car went.
- We saw that more friction made the car go slower. When there wasn't anything, the car went faster.

Time Trials

	1 st	2 nd	3 rd	4 th	5 th
plain	2.25	2.03	2.15	2.29	2.13
oily	7.94*	.51*	.86*	1.14*	2.28*
frozen	2.26	2.08	2.29	2.33	2.19
dirt	5.07*	4.28*	1.44*	2.28*	4.99*

Plain	2.17 seconds
Oily	1.116 seconds
frozen	2.23 seconds
dirt	4.612 seconds



Results

- On the plain track the car went from the start to the finish in 2.17 seconds.
- On the frozen track the car went from the start to the finish in 2.23 seconds.
- On the dirt track the car went 3.612 seconds. It didn't make it to the finish line. It went slower if it got off the track and then stopped.
- On the oily track the car went 1.116 seconds. The car never got off the track. It got stuck in the oil.

Conclusion

- Our hypothesis was not correct. The plain track was faster. We think that the car might have slowed down on the frozen track as the ice melted which made it a little slower.
- The smoother the surface, the faster the car went.
- The rougher the surface, the slower the car went.
- Texture changes how fast something can go, and friction changes how fast and slow the car goes.

Things we Learned Through this Experiment

- Friction makes things faster and slower like when it is on the carpet or when it is on the tile.
- We had to try different cars because the light cars launched out into the air.
- We also had to try different tracks because some of our tracks weren't flat and the car would go to the sides.
- We had to try different launchers to make sure that we didn't push it too hard or too soft. When we did that, it would make the car flip. When some people pushed harder it would go longer but the next person would soft and it wouldn't be the same. It wouldn't count. So, we found a launcher that was just a button.
- Friction can cause things to not move.



Next Steps

- We would try different tracks like a wet, Jello, grass, gum, wood, cotton, or candy roads.
- What would a car do on curvy roads? Would it go faster or slower?
- What would happen with different size wheels?
- How long can a car go straight on the different types of roads?
- Does weight change the speed of the cars on the tracks?
- Would a ramp change the speed and distance that the car could go?

Resources

- **What is Friction | Types of Friction | Science for Kids -**
<https://www.youtube.com/watch?v=pVCeZfBNE9Y>
- **Introduction to Friction for Children - Friction for Kids: FreeSchool -**
<https://www.youtube.com/watch?v=lkmAnLmXENo>
- **A True Book – Friction** by Matt Mullins
- **First Science - Motion** by Julie Murray
- **The Flash's Book of Speed** – Clare Hibbert