



ELASTIC CAR RACE

5-12 yrs | 20 min | Stage 2 - 3

Mission Question

Does adding extra mass change how far a car travels?



? Wonder & Predict

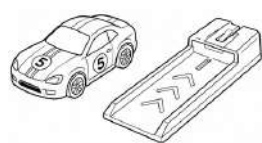
You are about to add extra mass to a toy car.
What do you think will happen?

- ☐ The heavier car will travel further
- ☐ The heavier car will travel a shorter distance
- ☐ The distance will stay about the same
- ☐ Something else: _____

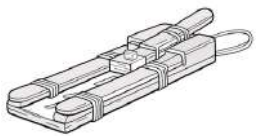
WHY DO YOU THINK THAT?



What you will need



- Elastic car launcher
(bought or made... see STEM section for launcher instructions)



- Toy car



- Playdough



- Tape measure



- Recording sheet



Investigate

Follow the steps carefully while observing.

1 Prepare the Car

Place the toy car in the launcher. Launch it once without any extra mass.

2 Measure the Distance

Measure how far the car travels.

Record your result.

3 Add Mass

Add a small amount of playdough. Predict what will happen.

- ☐ Travel further ☐ Travel less distance ☐ Stay the same

4 Test Again

Launch the car again. Measure the distance.

5 Increase the Mass, test & compare the results

Add more playdough. Launch again. Measure the distance.

Look for patterns.

Did changing the mass affect the distance?



Observe & Record

What clues did you discover?

- ☐ Heavier cars travelled less distance
- ☐ Adding mass changed the results
- ☐ The launcher force stayed the same
- ☐ Some results were different than expected
- ☐ The heaviest car travelled the shortest distance
- ☐ I noticed a pattern



What did you observe?

Describe what happened.

Why do you think this happened?



What happened?

Fill in the sentences using words from the box.

mass | force | acceleration | distance | heavier | speed

1. The launcher applies a _____ to the car.
2. Cars with more _____ are harder to speed up.
3. A _____ car usually accelerates more slowly.
4. Acceleration is a change in _____.
5. Less acceleration often means less _____ travelled.
6. Newton's Second Law links force, mass and _____.



The science behind it

More Mass = Less Acceleration

When the launcher pushes the car, it applies a force. Cars with more mass are harder to accelerate.

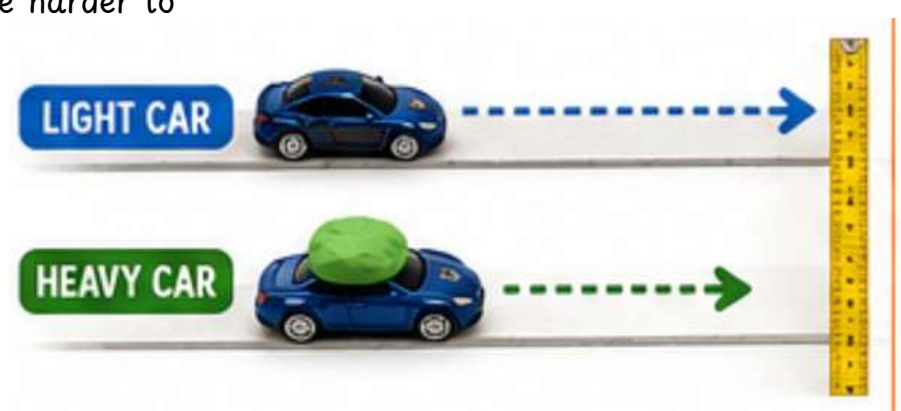
The same force produces less acceleration when the mass increases.

Less Acceleration = Less Distance

A car that accelerates less often leaves the launcher at a lower speed.

Lower speeds usually result in shorter distances travelled.

Engineers must think carefully about mass when designing vehicles, rockets and racing cars.



Take it further - Professor Picklebottom's Question

Can A Bigger Force Beat A Heavier Car?

You discovered that adding mass changes how far the car travels.

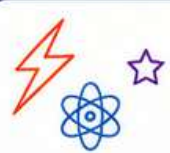
Now investigate a different variable.

Keep the mass the same, but change how much force the launcher applies.

My prediction:

What happened?

Try
Small pull-back
Medium pull-back
Large pull-back



KEEP THE SCIENCE GOING!

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start with wonder!



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what happens!



LOOK FOR PATTERNS
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lead to discoveries!



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change the world!



NEVER STOP EXPLORING!
There's always more
to discover!

