

Speaking Roles & Script

BTB - Beat the Brakes | General Physics

Roles retained as requested. Every member should know the whole investigation and be able to explain the road-length limitation.

Mohammad Mustafa Hussain Chattha

Introduction, question and prediction

Our group is BTB - Beat the Brakes. Our question is: how does road surface affect the mean stopping distance of a toy car? We used a fixed ramp height of 25 centimetres and predicted a stopping point of 90 centimetres. Visitors can place our prediction marker before a demonstration.

Aisha Shariq Shaffi

Variables and fair testing

We changed the road surface: smooth cardboard, felt and sandpaper. Our intended dependent variable was natural stopping distance in metres. We used the same car, release point and ramp height and released without a push. We measured from the ramp exit using the front wheels as our reference.

Usman Anjum Jajja

Working model, demonstration and safety

The ramp gives the car its starting motion. Our car rolled down and along the road, but all recorded trials reached the road end before stopping naturally. We must not treat an end barrier as friction stopping the car. We keep the ramp secure and hands clear during demonstrations.

Nivyan Asif Ali

Data, calculations and graph

Our three recorded distances were 100, 100 and 100 centimetres on smooth cardboard; 100, 95 and 98 on felt; and 85, 90 and 95 on sandpaper. We added each set and divided by three. The recorded means are 1.000, 0.977 and 0.900 metres. The graph shows recorded distances, not true natural stopping distances.

Ibrahim Bilal Haye

Physics, conclusion and improvements

Resistance at the surface, wheels and axles slows a rolling car. However, the road was too short in our tests. We cannot reliably compare natural stopping distances or confirm our 90-centimetre prediction. We would extend the road and repeat all trials. Our website includes a separate simulation for exploring the physics.

Questions & Honest Answers

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What did you change and measure?

We changed surface type and recorded the distance reached by the car. We intended to measure natural stopping distance, but every run reached the road end.

What did you keep constant?

The same car, 25 cm ramp height, release point and no-push release. We measured using the front wheels from the ramp exit.

What does your graph show?

The mean recorded distances: smooth 1.000 m, felt 0.977 m and sandpaper 0.900 m. These road-limited trials cannot establish a true stopping-distance ranking.

What would you improve next time?

Extend the flat road. Then repeat three trials for every surface with one fixed height and allow the car to stop naturally.

Was your prediction supported?

We predicted 0.90 m. Sandpaper's recorded mean is 0.90 m, but no run stopped naturally, so that numerical match does not confirm the prediction.

Why did you use a mean?

It summarizes three recorded values. Calculating a mean does not make road-limited trials valid natural-stop measurements.

Why does the car slow down?

Wheel, axle and road resistance oppose rolling and transfer mechanical energy to thermal energy and deformation. A barrier impact is a different stopping mechanism.

Can you lower the ramp instead?

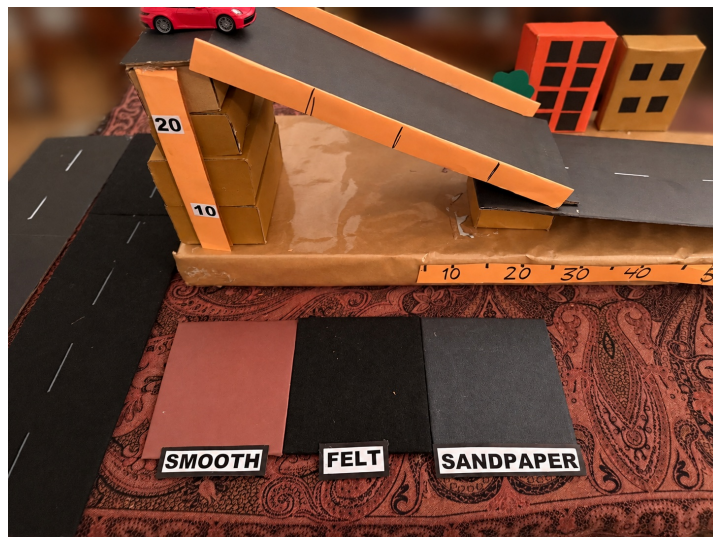
Yes, as a new fair test. Choose one lower fixed height for all three surfaces and collect a fresh full set; keep those results separate from the 25 cm runs.

Evidence Photos & Video

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Actual completed model - supplied group photo



Ramp and labeled smooth, felt and sandpaper samples

The supplied photos show the ramp, car, road, measuring strip and prediction marker. The provided videos document the model demonstration. A shortened 25-second clip is included separately. Road-end-limited runs remain a scientific limitation, even when the demonstration works.

What Remains Before Submission

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PREPARED

Poster with the required school details, names, question, variables, 25 cm setup, results and limitation.

PREPARED

Completed recorded-data table, worked calculations and labeled graph; scientific limitation stated.

PREPARED

Five named speaking roles and updated presentation script.

RECEIVED

Clear photos of the actual working model and several demonstration videos.

PREPARED

25-second demonstration video trimmed from your original recording; original files preserved.

STILL NEEDED

A longer road (or a new lower fixed-height test) and three natural-stop trials per surface to answer the intended question reliably.

STILL NEEDED

Print or mount the completed academic poster. The decorative model backdrop does not show all required school details.

STILL NEEDED

Photograph the completed printed poster and final data/graph display.

STILL NEEDED

Every member rehearses, understands the limitation and is ready to answer questions.

STILL NEEDED

One student submits all group files using Classroom OR email and brings the physical model and poster on Monday.

If valid repeat trials cannot be completed, submit the current documented work with its limitation and tell Mr. Mostafa Allam clearly that the stopping-distance investigation needs support. Do not claim that road-end contact is natural stopping.