RACE CAR ON DIFFERENT SURFACES

Introduction

Race car drivers drive race cars on racetracks. The racetracks usually have hard, smooth surfaces. They do not have bumps or ridges. The smoothness or roughness of a surface affects how well a car can move across it.

In this experiment, students can explore the scientific concept of friction by observing how a toy race car rolls across different surfaces. Friction is the force that works against movement. Different surfaces may create more or less friction against moving objects. When an object has less friction against a surface, less force is needed to move the object across the surface.

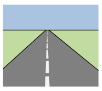
In this experiment, rolling a toy race car down a ramp allows the toy car to pick up momentum. Momentum is the amount of motion an object has gained. But students will change the surface of the ramp to see if that affects how far the toy car will roll off the ramp. They roll the toy car down the smooth surface of the book, the rough surface of sandpaper and the rough surface of a towel. A surface with more friction should make the toy car pick up less momentum and therefore stop sooner than a surface with less friction.

The students should do each roll three times. Scientists often repeat experiments to make sure the results are accurate and consistent.

What We Know:

- The NASCAR Cup Series Championship Race is on November 8.


- Race car drivers drive colorful race cars around the racetrack.

- They drive on a road around the racetrack.

- Roads can be different surfaces.

- Some surfaces are smooth, like a book.

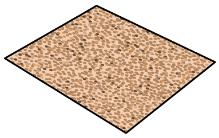
- Some surfaces are rough, like sandpaper or a towel.


Step 1: Ask a Question

- Will a ramp made with a book, sandpaper or towel help a toy race car roll the farthest?

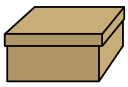

Step 2: Make a Guess / Hypothesis

I think...

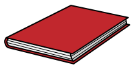

book	sandpaper	towel
		

Need:

short box



thin book



toy race car

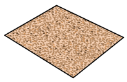
tape measure

pencil

Race Car Distance Chart (page 61)

tape

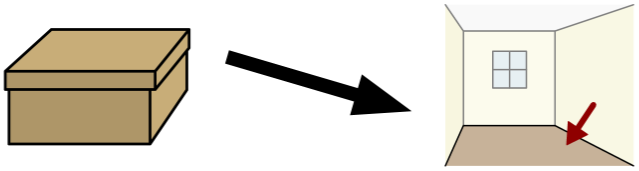
sandpaper



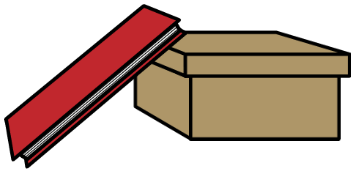
small towel

Step 3: Do an Experiment

1. Put box onto floor.

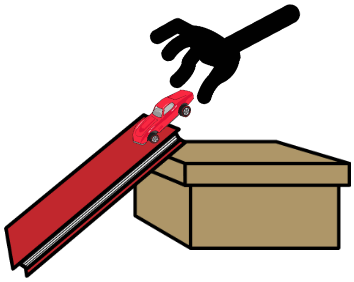


2. Prop book against box to create ramp.

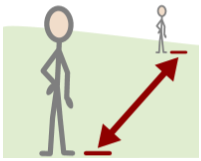


Step 3: Do an Experiment

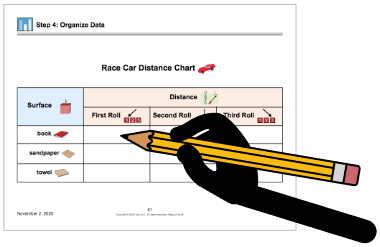
3. Hold toy race car at top edge of book. Let go of toy car.



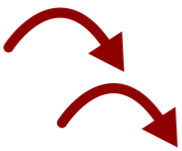
4. Observe how far toy car travels. Measure distance.



5. Write distance on Race Car Distance Chart.



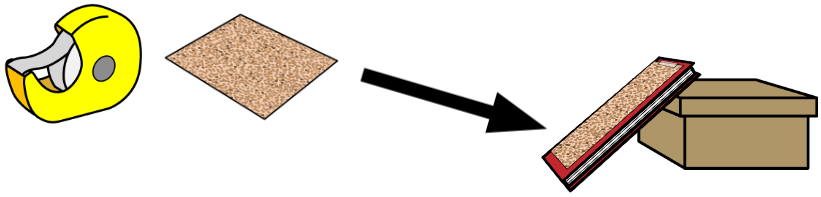
6. Repeat steps 3-5 two more times.



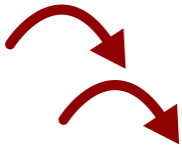
3 - 5 2 X

Step 3: Do an Experiment

7. Tape sandpaper to book.

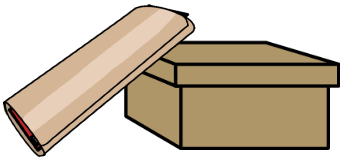


8. Repeat steps 3-5 two more times.

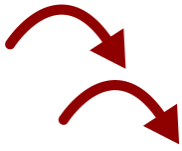


3 - 5 2 X

9. Wrap towel around book.



10. Repeat steps 3-5.



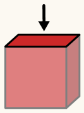
3 - 5

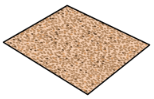
Race Car Distance Chart

Surface	Distance		
	First Roll 1 2 3	Second Roll 1 2 3	Third Roll 1 2 3
book			
sandpaper			
towel			

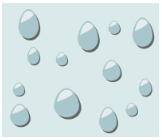
Step 5: Find the Conclusion

1. What ramp surface helped the toy race car roll the farthest?



book	sandpaper	towel
		

2. How would you describe this surface?

rough	smooth	wet
		

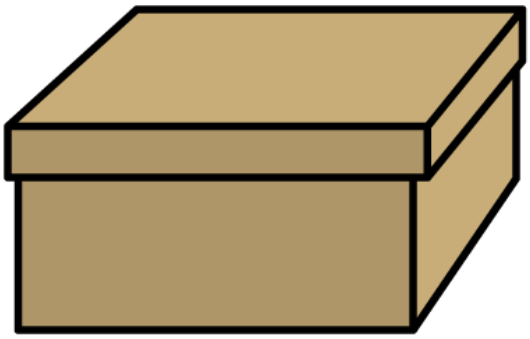
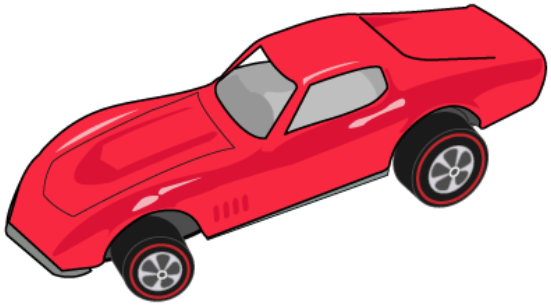
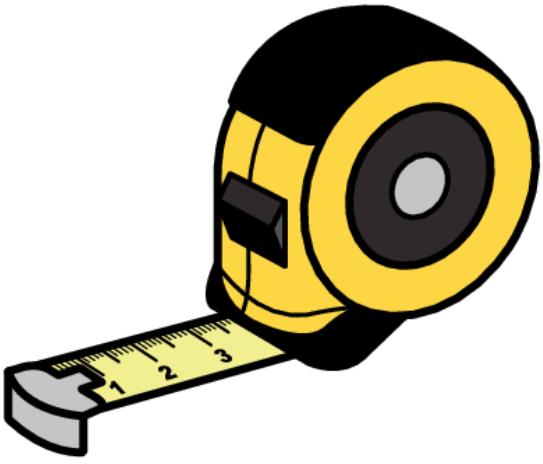
3. Was your guess correct?

yes	no
	

Questions for Class Discussion

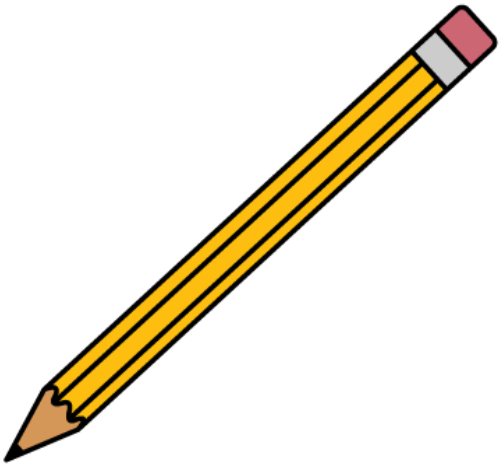
- Do you think the surface of a racetrack is rough or smooth? Why?
- What other surfaces could you test in the experiment?
- Do you think the toy race car would roll farther on grass or on a sidewalk? Why?

Read, practice and post these words on classroom or craft area word walls.

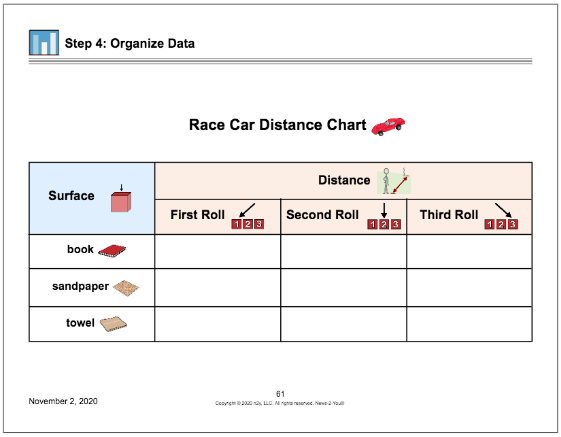
short box 	thin book 
toy race car 	tape measure 

Read, practice and post these words on classroom or craft area word walls.

pencil



Race Car Distance Chart



Step 4: Organize Data

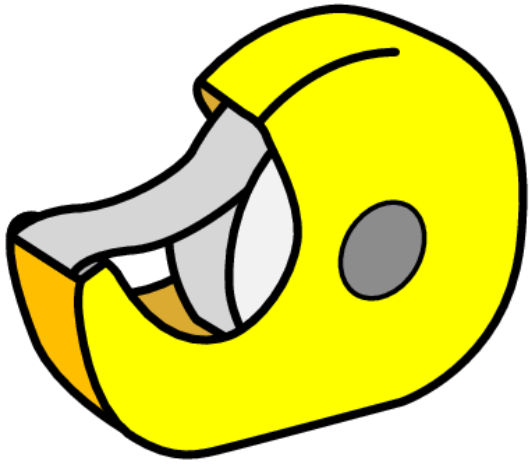
Race Car Distance Chart

Surface	Distance		
	First Roll 1 2 3	Second Roll 1 2 3	Third Roll 1 2 3
book			
sandpaper			
towel			

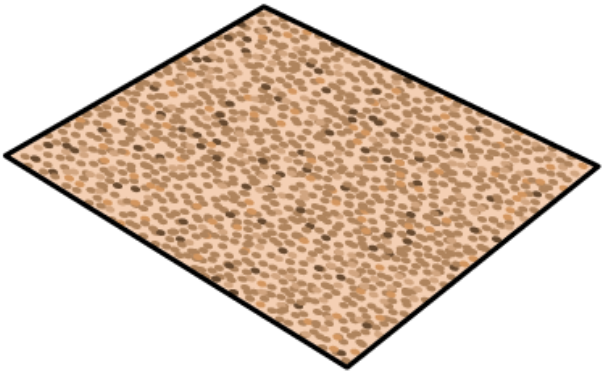
November 2, 2020

61

tape



sandpaper



Read, practice and post these words on classroom or craft area word walls.

small towel