

Experiment #3

79320

Comparing Rubber Band Racers



Objectives: Correctly identify and describe the difference between potential and kinetic energy in a rubber band racer system.

Materials You Will Need:

- built **SHORT RUBBER BAND RACER** and **RUBBER BAND RACER WITH MASS HOLDER** model (**NOTE: you will not be able to build both models at once**)
- #32 rubber bands

PROCESS:

1. Build the **SHORT RUBBER BAND RACER** model by following the step-by-step building instructions.
2. Describe the energy source that powers this vehicle.
3. Describe the action of this vehicle, using the terms potential and kinetic energy.
4. Compare the Short Rubber Band Racer model you have built with the picture of the Rubber Band Racer with Mass Holder from the instructions. Which vehicle do you think will travel the furthest, given the same amount of potential energy (rubber band windings)?

5. Test your prediction:

- a. Making sure to wind each rubber band the same number of times, measure the distance that the Short Rubber Band Racer travels once released. Perform the test 3 times and calculate the average. Once you have performed the test 3 times on the Short Rubber Band Racer, disassemble the model and build the Rubber Band racer with Mass Holder. Perform the test 3 times on that racer and calculate the average. Record all of your results in the table below.

DISTANCE THE RACERS TRAVELED IN CENTIMETERS

Racers	Trial #1	Trial #2	Trial #3	Average
Large Racer				
Small Racer				

6. Describe the results of your investigation.

EXTENSION ACTIVITY: Will a heavier car travel further than a lighter car?

For this extension activity, you will use the Rubber Band Racer with Mass Holder. For mass, you can use standard mass sets, rolls of pennies (20 per roll) or AA batteries.

1. What do you think will happen to the distance a rubber band powered vehicle travels if more and more weight is added? Why?
2. Test your prediction:
 - a. Find a way to give the rubber band racer different weights. Since we do not have a scale for this experiment, pick items that all have approximately the same weight, such as 3 AA batteries. Increase the number of batteries in the mass holder for each release, making sure to wind the rubber band the same number of times each time. Measure the distance that the racer travels once released and record your data in the table below.

DISTANCE THE RACERS TRAVELED IN CENTIMETERS

Weight	Trial #1	Trial #2	Trial #3	Average
No batteries				
1 battery				
2 batteries				
3 batteries				

3. Describe the results of your investigation