

Pull-Back Car Experiment

Materials:

- Pull-Back Car
- Ruler
- Tape
- Marker
- 5 Pennies
- A large, flat, smooth surface such as a wood or tiled floor, or a big table

Instructions:

1. Set up:
 - a. Find a large, flat, smooth surface where you can perform your experiment.
 - b. Place a piece of tape in your work area. Mark this piece of tape “START” with your marker. Note: You will need a few feet of space on either side of this piece of tape in order to conduct the experiment.
 - c. Use your ruler to measure six inches TO THE LEFT of the tape marked “START.” Place another piece of tape in this spot and mark it “1.”
 - d. Use your ruler to measure six inches TO THE LEFT of tape “1.” Place another piece of tape in this spot and mark it “2.”
 - e. Use your ruler to measure twelve inches TO THE LEFT of tape “2.” Place another piece of tape in this spot and mark it “3.”
2. Experiment Part One:
 - a. Place your pull-back car at the “START” tape. Pull it back to tape “1” and release. Write down your observations in the box below. Repeat the process for a second trial.
 - b. Place your pull-back car at the “START” tape. Pull it back to tape “2” and release. Write down your observations in the box below. What was different this time? Repeat the process for a second trial.
 - c. Place your pull-back car at the “START” tape. Pull it back to tape “3” and release. Write down your observations in the box below. What was different this time? Repeat the process for a second trial.
3. Experiment Part Two:
 - a. Tape 5 pennies to the top of your pull-back car. Place your car at the “START” tape and run more trials pulling the car back to tapes “1,” “2,” and “3.” Compare your results to your trials without the pennies. What was different this time?

Here is some important vocabulary. Try to use some of these words in your observations!

- **Energy:** The ability to do work
- **Potential Energy:** Stored energy an object has because of its position or state
- **Elastic Potential Energy:** Energy that is stored when an object is stretched or squeezed (like stretching a rubber band on your fingers)
- **Kinetic Energy:** The energy of motion that makes an object move
- **Speed:** How quickly an object changes position from one place to another
- **Mass:** An object's weight
- Force: A push or pull on an object
- Collision: When two objects come into contact with each other
- Gravity: An invisible force that pulls things towards each other/the ground
- Friction: The resistance of motion when one object rubs against another

Observation Sheet: No Pennies

TAPE #	TRIAL #	OBSERVATIONS OF MOVEMENT
Tape "1"	Trial 1	
Tape "1"	Trial 2	
Tape "2"	Trial 1	
Tape "2"	Trial 2	
Tape "3"	Trial 1	
Tape "3"	Trial 2	

Observation Sheet: With Pennies

TAPE #	TRIAL #	OBSERVATIONS OF MOVEMENT
Tape "1"	Trial 1	
Tape "1"	Trial 2	
Tape "2"	Trial 1	
Tape "2"	Trial 2	
Tape "3"	Trial 1	
Tape "3"	Trial 2	