

Pull-Back Car Experiment

Materials:

- Pull-Back Car
- Ruler
- Tape
- Marker
- 5 Pennies
- A large, flat, smooth surface such as 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 “2” 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	It turned then went forward then stop at my kitchen rug
Tape "1"	Trial 2	This time when I pulled it went straight and went further and touched my kitchen counter
Tape "2"	Trial 1	It did not go far it twirled then went 12 inches away from the start tape
Tape "2"	Trial 2	This time it twirled again then curved and went 12 feet 1 in a half inches away from the
Tape "3"	Trial 1	It used a lot of energy at tape 3 and curved far away from the track
Tape "3"	Trial 2	This time it went from tape 3 to tape 1 and curved

Observation Sheet: With Pennies

TAPE #	TRIAL #	OBSERVATIONS OF MOVEMENT
Tape "1"	Trial 1	It moved only 7 in a half inches away from tape 1
Tape "1"	Trial 2	This time all the mass on it push it down that it went no were
Tape "2"	Trial 1	It went very far this time but then slowed down
Tape "2"	Trial 2	This time it went very fast and a penny fell off
Tape "3"	Trial 1	It went very very fast it started fro kinetic energy to potential energy

Tape "3"	Trial 2	This time it was going fast but curved and headed toward me
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