



# Law of Conservation of Mechanical Energy

## **OBJECTIVES**

Students will analyze the conservation of mechanical energy in a system.

## **SAFETY**

Please follow the usual safety procedures regarding use of the Smart Cart and track.

## **MATERIALS**

- PASCO Smart Cart with a rubber nub attachment, track, force bracket

## **PROCEDURE**

1. Set up your track with a force bracket at one end. Elevate the track so that the surface of the track at the 100cm mark is 0.100m above the table and the end with the force bracket is on the table. Measure how high the surface of the track is above the table at the location of the force bracket.
2. Turn on Capstone, connect your car to the Bluetooth, and create a Velocity v. Time graph.
3. Place your Smart Cart so that the end with the rubber nub is facing toward the bottom of the track and is aligned with the 100cm mark.
4. Begin recording data and allow your Smart Cart to fall to the lower end of the track. Then stop recording data.
5. Measure the velocity when the Smart Cart hit the bottom of the track.
6. Wipe the sweat off of your brow after all of that hard work.

## **DATA TABLES & GRAPHS**

- ♥ Record the mass of your car.
- ♥ Record the initial and final heights of your car.
- ♥ Record the final velocity of your car.

## **DATA ANALYSIS**

- ♥ Calculate the change in gravitational potential energy as the car fell.
- ♥ Calculate the change in kinetic energy as the car fell.
- ♥ Calculate the percent difference between the magnitudes of the two values.

## **CONCLUSION**

Draw a conclusion about the objective of this lab.