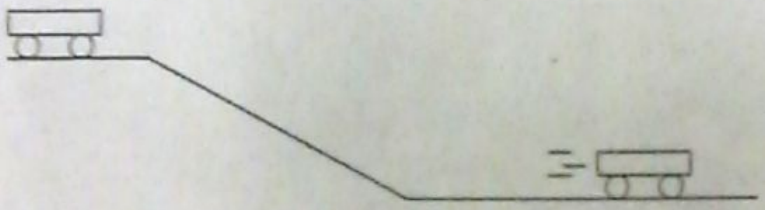
Conservation of energy: A Hot wheels car rolling down a track

Conservation of energy **means that the total energy of a closed system does not change: however, some of the energy can change from one form to another.**

We will let a hot wheels car roll down a hill. We will make measurements to determine the initial potential energy at the top of the hill and the final kinetic energy of the bottom of the hill.

When the car is at the top of the hill it has potential energy. It has no kinetic energy.

When the car reaches the bottom of the hill, it has kinetic energy. Since it is at ground zero, we say that it has no potential energy.



Make a hypothesis: Make an educated guess regarding the initial potential energy of the car and the final kinetic energy of the car.

a) The final kinetic energy of the car will be *greater than* the initial potential energy of the car.

b) The final kinetic energy of the car will be *less than* the initial potential energy of the car.

c) The final kinetic energy of the car will be *equal to* the initial potential energy of the car.

We will now run the experiment and make measurements to test your hypothesis.

PHY 111 **Conservation of Energy: Hot Wheels**

Set up the track as shown.
The initial state is the car at rest at the top of the track at y_o.

The final state is the car moving with velocity v_f at the bottom.

Record:

$y_o =$ $v_o =$ $m =$

1. Calculate the initial potential energy of the car.

2. Calculate the final kinetic energy of the car.

3. How many joules of heat were generated by the car as it rolled down the track?

4. What percent of the initial potential energy was "lost" to heat?

5. Explain why it was reasonable to predict that the final kinetic energy should be less than the initial potential energy.