Rotational Kinetic Energy on a Ramp Lab

Purpose-

Design an experiment that combines energy considerations with 2D kinematics to determine how much of the initial potential energy is converted into rotational kinetic energy.

Equations-

Gravitational Potential Energy= (Mass)(Gravity)(Height)

Kinetic Energy= (1/2)(Mass)(Velocity) ^{2}

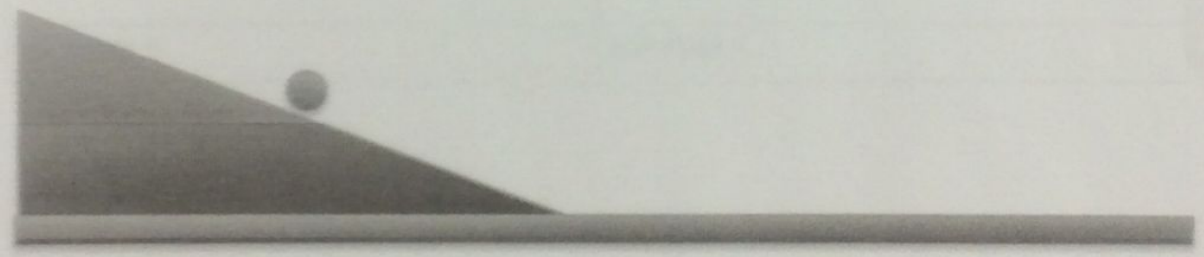
Rotational Kinetic Energy= (1/2)(Inertia)(Angular Velocity) ^{2}

Inertial of Sphere= (2/3)(Mass)(Radius) ^{2}

Materials-

Steel Ball, Hot Wheels Track, Tape, Meter Stick, and Stop Watch

Diagram of Setup-



Experiment-

1. Gather all materials and set up apparatus to match the diagram above.
2. Measure the height of the ramp and solve for the initial energy of the system.

3. Roll the ball down the ramp and measure the linear kinetic energy as it hit the bottom of the ramp.
4. Solve for the rotational kinetic energy and determine what fraction of the initial energy converts into rotational.
5. List all potential sources of error.

Data-

Mass of Ball = _____

Radius of Ball = _____

Height of Track = _____

Time (sec)	Distance (meters)
Average =	Average =

Potential Energy = _____

Linear Kinetic Energy = _____

Rotational Kinetic Energy = _____