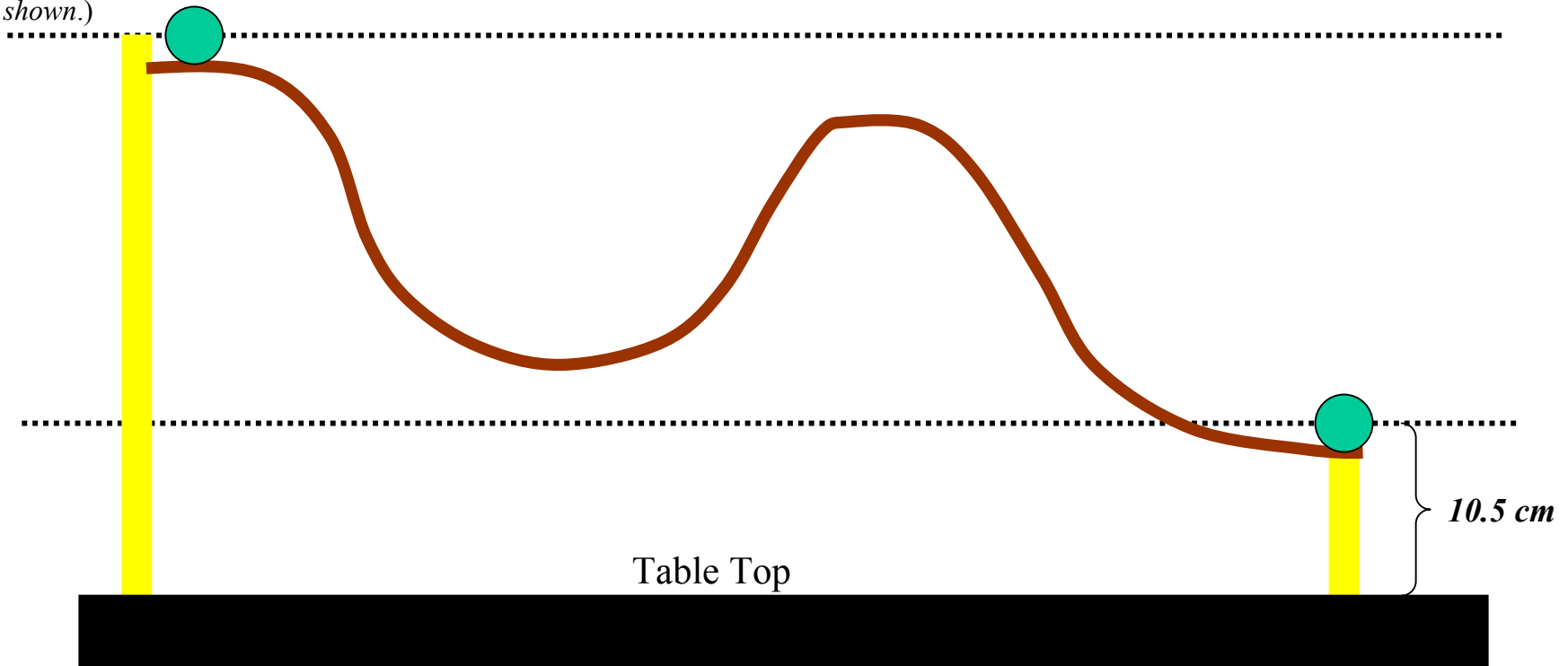


ROLLER COASTER “ENERGY CONSERVATION” LAB (i.e. CPO LAB 5.2)

Graphing Potential & Kinetic Energy vs. Position on Coaster – Required for Sections D & E as part of their lab submittal – Optional / Alternative Submittal for Sections A & B.

Instructions: On a separate piece of graph paper and using Position, Height & Velocity data already recorded in the table of Part 3 of your lab, calculate and plot the Kinetic Energy [$KE = \frac{1}{2} (m)(V^2)$]* and Potential Energy [$PE = (m)(g)(\Delta h)$]* for each Position along the Roller Coaster. NOTE: Prior to preparation of your graph you’ll need to prepare a Table of pertinent data with associated KE & PE calculations. Calculate your Kinetic & Potential Energies in “Ergs” (*one Erg = 10^{-7} Joule*) using the CGS (*aka the Centimeter, Gram, Second*) System. Use 4.360 grams as the mass of the plastic ball or 28.203 grams as the mass of the steel ball. Further, use 10.5 cm as the height between the Table Top and lowest-most position on the coaster as shown below. (*NOTE: The KE & PE (for each position) must be calculated separately / independently – with all work shown.)



Fyi – Recall that on 02-15-07 the SOC problem showed that there was a maximum of about 710,000 Ergs of energy available (*via the ball*) in our roller coaster due the maximum change in height (Δh) from the highest to the lowest points on our coaster. As such, layout your dependent axis (graduations) accordingly. **Remember, “g” in the CGS system is 981 cm/s².**