

# POTENTIAL ENERGY EXPERIMENT

FEBRUARY 16, 2023

## THEORY RECAP

No new theory was discussed today. We continued studying potential energy and watched a couple of videos of an experiment with bouncing balls. The homework is about studying the data we obtained in this experiment.

## HOMEWORK

1. In the class we watched videos comparing how two different balls bounce off a desk. A black rubber ball has mass 43 grams while a tennis ball has mass 56 grams. They are both initially held at 60 cm above the desk and then released with zero initial speed. After the first bounce maximal elevation reached by the black rubber ball was 46 cm, while for the tennis ball it was 35 cm. Compare how much energy (in Joules) each of the balls lost during the first collision.
2. In the conditions of the last problem, the full sequence of maximal elevations reached after subsequent collisions was **for the black rubber ball**: 46 cm, 34 cm, 25 cm and **for the tennis ball** 35 cm, 20 cm. Find what **fraction of mechanical energy** was lost during each collision by each of the balls.
- \*3. Assume I want to keep the black rubber ball bouncing up to 60 cm every time. In order to do so, I supply it with some downward momentum every time it reaches the highest point. Using our experimental data given above estimate the momentum which is needed to keep it bouncing up to 60 cm every time.