Physics 200

Projectile Launcher Efficiency

\*\*Pretend for this assignment that there is no air resistance!

**Goal**: to answer the question and have a solid general understanding of the underlying energy principles behind this event. Don’t focus on an extremely high level of precision.

**Question**: How will the efficiencies of an oak projectile and a steel spherical projectile compare when launched vertically from one of the class projectile launchers – using the same “power setting” for both projectiles?

**Hypothesis** [what do you think? Why?]:

**Data:** Experiment with the launcher until you can launch the oak projectile vertically to a point that almost reaches the ceiling. Then collect (or determine) the following for both projectiles:

1. The work done in cocking the launcher before firing (should be the same for both projectiles). To find this, you will need to measure the force applied to the string as you cock the launcher.
2. The starting height and ending height of the projectile during a launch.
3. The projectile mass.
4. The total energy of the projectile at its highest point.

**Fill this out so that I can check your work:**

Questions:

1. Does it matter whether you measure height at the bottom, middle, or top of the projectile? Explain.