



Energy and Motion: Teacher Tips & Helpful Hints

N.C.S.S: PS.7.1 Understand motion, the effects of forces on motion, and the graphical representations of motion.

PS.7.2 Understand forms of energy, energy transfer and transformation, and conservation in mechanical systems.

- The activity is broken up into three different parts:
 - **Part 1: Potential and Kinetic Energy** (PS.7.2.1)
 - **Part 2: Motion and Graphing** (PS.7.1.3, PS.7.1.4)
 - **Part 3: Simple Machines** (PS.7.2.4)

Part 1: Potential and Kinetic Energy

- The measuring tape is in mm too.
- Students may need to stabilize the tube. They can hold the tube or use tape.
- There is a *Potential and Kinetic Energy: Student Activity Sheet* available.

Part 2: Motion and Graphing

- Students are to begin the time when the marble hits the start line and not when they place it in the tube.
- Assistance may be needed to begin the time vs distance graph.
- The four different Distance/Time graphs are located on the *Motion and Graphing: Student Activity Sheet*.
- There is a *Motion and Graphing: Student Activity Sheet* available.

Part 3: Simple Machines

- We have included YouTube videos that show how to disassemble and assemble the nail clippers.

N.C.S.S Clarifying Objectives

- PS.7.1.3 Analyze and interpret graphical data to summarize the motion of an object to show a change in position over a period of time.
- PS.7.1.4 Analyze and interpret graphical data to summarize the motion of an object to show a change in distance over a period of time for constant speed and variable motion.
- PS.7.2.1 Construct an explanation to summarize how kinetic and potential energy contribute to the mechanical energy of an object.
- PS.7.2.4 Carry out investigations to compare the efficiency of simple machines in relation to their advantages for particular purposes (to include inclined planes, pulleys, levers and wheel and axles) using qualitative data.