



# *MND Physics*

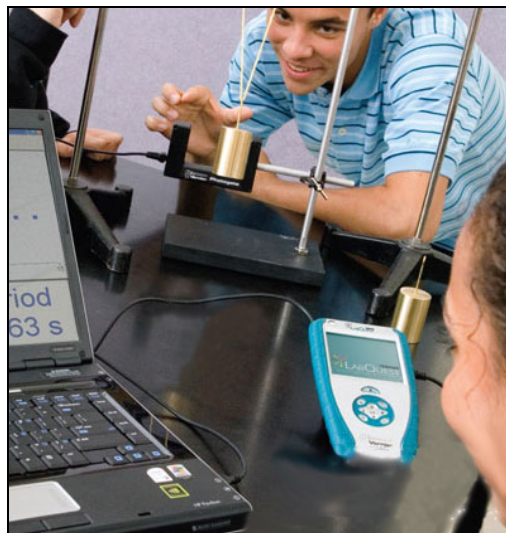
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## Student Designed Conservation of Energy Lab

Student designed physics labs offer the student-scientist an opportunity to explore physical concepts and knowledge in an open-ended, pseudo-nonrestrictive lab environment. In this energy lab, students are charged with applying creative thought to design and test activities that can explore conservation of energy. Specifically, the student will investigate and report on the following conservation of energy principles:

- Conversion of  $PE_g$  to KE
- Conversion of  $PE_{SPRING}$  to  $PE_g$
- Conversion of KE to Q (heat energy)

In each case, the student will define the process, create an activity that demonstrates the specific transfer of energy, conduct the activity collecting data in a lab setting, and finally, analyze the data in a report clearly showing the correlation between the energy transformation studied and the collected data.



**EQUIPMENT:** You have the following equipment available to conduct your experiments: you are not required to use all the items listed. Further, you may ask for other pieces of equipment not listed below. However, equipment not listed below will be subject to availability from Mr. P., i.e. ask for availability and feasibility first.

### **VERNIER LAB QUEST DIGITAL LAB-STATIONS**

#### **AVAILABLE VERNIER SENSORS:**

Dual-range force sensor

Pulleys and string

Motion detector

Photogate

Temperature probe

#### **LAPTOP WITH LOGGER-PRO SOFTWARE (printable graphs)**

#### **MEASUREMENT TOOLS:**

Meter stick

Metric ruler

Protractor

Stopwatch

Calculators

Triple-beam balance

#### **OTHER EQUIPMENT:**

Sand paper

Dart gun with darts

Mass sets

Coffee filters

Masking tape

Ramps

Rubber balls

Tennis balls

Wood blocks

String

Rubber Bands

Paper and paper clips

Ball bearings

Pendulum

Support stands

Clamps for support stands

## Lab Report Format

Your lab report must follow the format outlined in detail on the website. The following sections must appear in your report:

1. Hypothesis
2. Equipment Used
3. Procedure (include 1 for each of the 3 studies)
4. Data (data tables can be informal: the actual collected data must be included in the report)
5. Data Analysis including graphs
6. Verification of Hypothesis Based on Collected Data

Please review the Lab Report Format page on the website for details.