

Small Engine Horse Power Lab

Submitted by Corrine Smith and used in cooperation with the University of Illinois at Urbana-Champaign.

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Small Engine Horse Power Lab
Ag Mechanics Class

Name _____

This is an introduction lab I use to my small engines class.

Materials needed are a stop watch – I use my wrist watch which has a stop watch on it, a set of stairs, weights from weight room, and clipboard and paper to record results.

The purpose of this lab is to demonstrate the principle of Horsepower. HP is 33,000 foot-pounds of work done in one minute or 550 ft-lbs done in one second. A foot pound is done when one pound is lifted one foot. If students know their approximate weight and you can measure the height of the stairs in feet, you can figure the foot pounds lifted over time. Ex. A 150 lb person running up 10 feet stairs in 10 seconds would put out 150 ft-lbs per second. Divide this by 550 would give you .27 Horse Power of work.

I have students run up the stairs individually and time them. They have to give me a weight they want me to use that they weigh. I often assign a weight to avoid embarrassment if I have over weight students in class.

After students run up the stairs, I give them a 20 lb. or more weight. They repeat the run up the stairs and refigure the HP.

I record all data. When done, I give all students a copy of the data. They figure their own hp at different weights. I also ask that they graph the results to show comparisons of class members. I use this to introduce graphing and reading graphs, something that is emphasized on the PSAT test.

Other activities are possible to add and modifications can be made to the lab.

NOTE: I am very careful in making sure all students are aware of the dangers of running up stairs as not to have accidents with injuries. The purpose is to demonstrate, not compete. Any student who does not follow directions is eliminated from adding their data and receives a deduction in grade. I also am careful that the noise made does not interfere with other classes.