

Lesson 5

Percent Efficiency

Recall labs done of work-energy theorem and conservation of energy. Friction was a big source of error in these labs that resulted in less than 100% energy transfer.

We compute a percent efficiency to determine how complete an energy transfer is.

$$\text{Efficiency} = \frac{\text{useful output energy}}{\text{total input energy}} \times 100\%$$

Example:

What is the efficiency of a crane that uses 5.10×10^5 J of energy to lift 1.0×10^3 kg a vertical height of 32.0 m?

Example:

A worker uses a pulley system to raise a 24.0 kg carton 16.5 m. A force of 129 N is exerted and the rope is pulled 33.0 m. What is the efficiency of the system?

Example:

A boy exerts a force of 225 N on a lever to raise a 1250 N rock a distance of 13 cm. If the efficiency of the lever is 88.7%, how far did the boy move his end of the lever?

STSE: Bungee Jumping