

> If the gravitational potential energy of the object at its initial position is zero, then the final gravitational potential energy can be written as

$$PE_{\text{grav}} = m a_g h$$

POWER

*** The rate of doing work is known as **power**.

*** By rate, we mean the speed with which work is done.

*** And when we speak of speed, we always think of time.

*** Power depends on the time one does a particular piece of work.

Example:

ooo Two students of the same weight are helping a charity drive. They run up the stairs where the event is happening. The students climb 12 meters up, one in 7 minutes and the other in 10 minutes.

ooo The work done by the students are the same, but the times are different. Thus, some other factors are influencing the two students. This factor is the student's power. Power is the rate of doing work or transforming energy.

$$P = W/t$$

or

$$P = \Delta E/t$$

...> The unit of power is **joules per second (J/s)**.

...> This SI unit. has the name watt (W), in honor of **James Watt**, who invented the steam engine. For historical reasons, the horsepower is occasionally used to describe the power delivered by a machine.

...> One horsepower is equivalent to approximately **746 Watts**.