

Today we will learn about: WORK and POWER

Work, in a physics sense, is made of a _____ and a _____

•These MUST be in the same _____! •If the force is applied at any angle other than the direction moved, the amount of the force actually doing the work is less than what you're putting into it. (Cos for horiz, Sin for vert) •If something is falling down, even if you are pushing up on it to slow it down, the "work" is being done by the object's weight, not by you. •You exert a force, but the direction of movement is not in the same direction as your applied force. When you mow the lawn, the angle of the handle receives your applied force. Only that portion of your force which actually goes in the direction the mower moves (forward) will actually do the work.

Our work formula is $W = Fd$

Ex. You push on a mower with 945 N of force. The handle makes a 55° angle with the ground. How much work is it to mow 12 m?

We know: 945 N =
12 m =
 55° =
W = ?

Another way of saying Nm is _____ (J), which is the unit of **work and energy**. Since they are small, we often see them written as kJ (KiloJoules) or 1000 J.

_____ is related to **work**. It is how fast work is done. A more powerful motor will either do _____ work in the same time period, or it will finish the same amount of work in a _____ time period. The two factors involved here are clearly: Work and Time The relationship with work is direct, with time is: Inverse!

So the formula becomes: $P = W/t$ also written as: $P = Fd/t$

A 736 N person runs up 20.0 m of stairs in 8.35 seconds. What is his Power?

We know: 736 N =
20.0 m =
8.35 sec = t
P = ?

The unit of power is also better known as a _____ (W), also seen as kiloWatts. So our final answer could be written as 1.76 kW

remember: 1 N.m = J and 1 J/s = W

For homework! • Pbs A, of course...