PS Physics – Unit 2A – Part 1

Work, Power, and Machines

What is Work?

* In science, the word \_\_\_\_\_\_\_\_\_ has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than you may be familiar with.
* The scientific definition of \_\_\_\_\_\_\_\_\_\_ is: using a \_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_ an object a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (when \_\_\_\_\_\_\_\_\_\_\_\_ the force and the motion of the object are in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_).

Formula for work

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_ = Force x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ W=FD
  + The unit of force is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The unit of distance is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The unit of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is newton-meters
  + One newton-meter is equal to one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + So, the unit of work is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Power

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the \_\_\_\_\_\_\_\_\_\_\_\_\_ at which \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is done.
  + Power = Work\*/Time

\*(\_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

* + The unit of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the \_\_\_\_\_\_\_\_\_\_\_\_\_.

Work and Power

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – done when a \_\_\_\_\_\_\_\_\_\_\_\_ acts on an \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the object moves
  + Requires \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Man is not actually doing work when holding barbell above his head
    - Force is applied to barbell
    - If no movement, no work done
* Work Depends on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + If all \_\_\_\_\_\_\_\_\_\_\_\_ acts in same \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of motion = all \_\_\_\_\_\_\_\_\_\_\_ does work.
  + If \_\_\_\_\_\_\_\_\_\_\_\_\_ applied force acts in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of motion = part \_\_\_\_\_\_\_\_\_\_\_\_\_\_ does work.
  + If none of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the motion = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ does no work.

Calculating Work

* \_\_\_\_\_\_\_\_\_\_\_\_\_ = Force x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* W = Fd
  + Force = \_\_\_\_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 F = ma
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (J) = SI unit for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Unit: J = N(m)
  + Named after James Prescott Joule (1818 – 1889)
  + Researched \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

What is Power?

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a measure of the \_\_\_\_\_\_\_\_\_\_\_\_\_ of doing \_\_\_\_\_\_\_\_\_\_\_\_\_
* More \_\_\_\_\_\_\_\_\_\_\_\_\_\_ = work at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate
  + Size of engine often indicates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Can work at a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ rate
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ = Work/\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + P= W/t
  + \_\_\_\_\_\_\_\_\_\_\_\_ (W) = SI unit for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Units: W = J/s

James \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (hp) = another unit for power
  + Equals ~\_\_\_\_\_\_\_\_\_\_ watts
  + Defined by James \_\_\_\_\_\_\_\_\_\_\_\_\_ (1736- 1819)
    - Trying to describe power outputs of steam engines
      * Horses were most common used source of power in 1700s