

Energy, Work, & Simple Machines

Section 3: Work



Work is the transfer of energy that occurs when a force makes an object move. For work to be done, something has to move, and the motion must be in the same direction as the force. For example, if you push a wheelbarrow and it does not move, then you haven't done any work. When work is done, a transfer of energy from one object to another always takes place.

To calculate work, you multiply the applied force by the distance traveled.

Work (in joules) = applied force (in newtons) x distance (in meters)

$$W = F \times d$$

You push a wheelbarrow with a force of 135 N a distance of 25 m. How much work did you do?

The rate at which work is done or energy is transferred is called **power**. When you run a mile, you are using more power than you would if you were walking that mile because you've gone the same distance in less time.

**Power (in watts) = work (in joules)
time (in seconds)**

$$P = \frac{W}{t}$$

You do 800 Joules of work in 10 seconds. What was your power?

Review:

1. Define work.
2. Identify the formula used to calculate work.
3. Identify the formula used to calculate power.