

Name: _____
 Science 7

Date: 12/2/19
 Work and Machines (NOTES)

Aim: I can differentiate between work and power.

Do Now: Solve the following work word problems. Write all 3 steps.

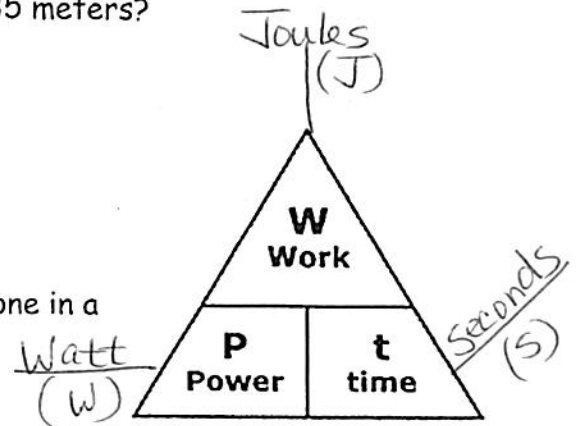
1. You carry a 20 N bag of dog food up a 6 m flight of stairs. How much work did you do?

2. How much energy do you give a 200N couch if you push it 35 meters?

Notes:

Power

- How quickly work is done.
- The amount of work done in a certain amount of time.



Example Questions:

1. A figure skater lifts his partner, who weighs 450N 1.0 m in 3.0s. How much power is required?

Formula:	$W = F \times d$	$P = \frac{W}{t}$
Substitute:	$W = 450N \times 1m$	$P = \frac{450J}{3s}$
Final Answer with Units:	$W = 450.0J$	$P = 150.0W$

2. Frank does 2400J of work in climbing a set of stairs. If he does the work in 6 seconds, what is his power output?

Formula:	$P = \frac{W}{t}$
Substitute:	$P = \frac{2400J}{6s}$
Final Answer with Units:	$P = 400.0 W$

TWO STEPS
 1- Find work
 2- Find power



3. A small motor does 4000J of work in 20 seconds. What is the power of the motor in watts?

Formula:	$P = \frac{W}{t}$
Substitute:	$P = \frac{4000\text{J}}{20\text{s}}$
Final Answer with Units:	$P = 200.0\text{ W}$

4. If 68 W of power is produced in 18 seconds, how much work is done?

Formula:	$W = P \times T$
Substitute:	$W = 68\text{ W} \times 18\text{ s}$
Final Answer with Units:	$W = 1224.0\text{ J}$

5. A person weighing 600 N gets on an elevator. The elevator lifts the person 6 m in 10 seconds. How much power was used?

Formula:	$W = f \times d$	$P = \frac{W}{t}$
Substitute:	$W = 600\text{ N} \times 6\text{ m}$	$P = \frac{3600\text{ J}}{10\text{ s}}$
Final Answer with Units:	$W = 3600.0\text{ J}$	$P = 360.0\text{ W}$

6. You go rock climbing with a pack that weighs 70 N and you reach a height of 30 m . If you finished the climb in 600 s , what was your power?

Formula:	$W = f \times d$	$P = \frac{W}{t}$
Substitute:	$W = 70\text{ N} \times 30\text{ m}$	$P = \frac{2100\text{ m}}{600\text{ s}}$
Final Answer with Units:	$W = 2100.0\text{ m}$	$P = 3.5\text{ W}$