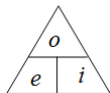


# 5.1 - Jambalette!!! - Work, Power, Force

Name \_\_\_\_\_

Efficiency:  $e = \frac{o}{i}$



1) A heater consumes 1210 J of energy from natural gas, and puts out 1150 J of heat into the home. What is its **efficiency**?

2) An electric motor is 91.0 % efficient. What is its **power output** if it consumes 832 W of electrical power?

3) A car is 23.0 % efficient. If it does 13,200 J of work, what **energy** in fuel does it consume? If it consumes 4,230 J of fuel, what **work** does it do?

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



4) A heater puts out 340. J of heat in 2.40 s. What is its **power**?

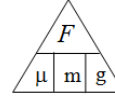
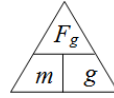
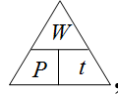
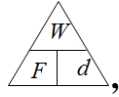
5) A 210. W motor does 4,520 J of work in what **time**?

6) A 40.0 W light bulb consumes what **energy** in a minute (60 s)?

1) 0.950 or 95.0 %, 2) 757 W, 3) 57,391 J, 972.9 J, 4) 142 W, 5) 21.5 s, 6) 2400 J

# Jambalaya!!

$$W = Fd, \quad P = \frac{W}{t}, \quad F = mg \text{ or } F = \mu mg$$



## Two step problems:

7) What **work** is it to drag a 12.0 kg box 17.0 m across the floor where the coefficient of friction is 0.210?

8) A winch does 732 J of work lifting what **mass** to a height of 3.20 m?

9) Sled dogs do 11,300 J of work dragging a 117 kg sled 75.8 m. What is the **coefficient of friction**?

## Three Step:

10) A survivor contestant drags a 125 kg box 214 m across a surface with a coefficient of friction of 0.170 in 145 s. What is their **power** output?

11) What is the minimum **time** a 746 W motor can lift a 2130 kg Land Rover 3.20 m?

12) A sled dog team has a power output of 895. W. In what **time** can it drag a 141 kg sled 1,320 m across a frozen lake where the coefficient of friction is 0.110?

13) An elevator motor must lift a 3,210 kg elevator 18.3 m in 13.0 s. What is its minimum **power** rating?

7) 419.8 J, 8) 23.3 kg, 9) 0.130, 10) 307 W, 11) 89.5 s, 12) 224 s, 13) 44,283 W