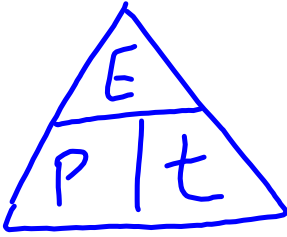
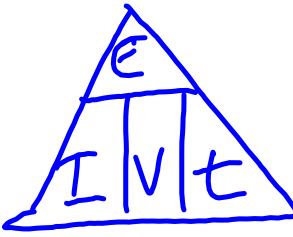


# Energy

Def: An **electric** charge that lets work be accomplished

## Formulas, triangles and units

Formulas	$E = Pt$	$E = I V t$
Triangles		
Units	$E = J, kJ, kWh$ $t = S_{seconds}$	

## Conversions

J to kJ  $\div 1000$       sec to hrs  $\div 3600$

J to kWh  $\div 3600000$       hrs to sec  $\times 3600$

min to sec  $\times 60$       sec to min  $\div 60$

Energy Questions



1. A radio is on for 2 hours and has 700 W of power. How much energy was used in J?

$$E = Pt \quad 700 \times 2 \times 3600 = 5040000 \text{ J}$$

2. A radio is on for 2 hours and has 700 W of power. What is the energy in kJ and kWh?

$$E = Pt \quad 700 \times 2 \times 3600 = 5040000 \text{ J} = 5040 \text{ kJ} = 1.4 \text{ kWh}$$

3. A hairdryer is used for 20 minutes a day. It runs on 190 V and 3 A. How much energy is used in J?

$$E = IVt \quad 3 \times 190 \times 20 \times 60 = 684000 \text{ J}$$

4. How much energy in kJ does a computer use if it is on for 3 hours and uses 200 V and 2.0 A.

$$E = IVt \quad 2 \times 200 \times 3 \times 3600 = 4320 \text{ kJ}$$

5. If a computer used 950 000 J of energy and 100 W of power. How long did you use the computer for?

$$t = \frac{E}{P} \quad \frac{950000}{100} = 9500 \text{ s}$$

6. If a TV used 950 000 J of energy and 90 W of power. How many hours did you watch TV for?

$$t = \frac{E}{P} \quad \frac{950000}{90} = 10555.5 \text{ s} = 2.9 \text{ hrs}$$

7. How much power did it take to use a microwave for 90 seconds and consumed 70 000 J of energy?

$$P = \frac{E}{t} \quad \frac{70000}{90} = 777.8 \text{ W}$$

8. How much power did it take when a dishwasher ran for 55 minutes and consumed 50 000 J of energy?

$$P = \frac{E}{t} \quad \frac{50000}{55 \times 60} = 15.1 \text{ W}$$

9. A hairdryer uses 220 V and 7 A. If the hairdryer used 525 000 J of energy, how much time did you use it for in minutes?

$$t = \frac{E}{IV} \quad \frac{525000}{7 \times 220} = 340.9 \text{ s} = 5.7 \text{ min}$$

10. A computer is on for 160 minutes and needs 220 V to work. If the computer used 925 000 J of energy, what was the current intensity for the computer?

$$I = \frac{E}{Vt} \quad \frac{925000}{220 \times 160 \times 60} = 0.44 \text{ A}$$

11. A juicer connected to a 120-V power source draws a current of 0.15 A. This appliance was used for 10 minutes. How much electrical energy did this appliance use during this period?

A) 3 J    B) 18 J    C) 180 J    D) 10 800 J

$$E = IVt \quad 0.15 \times 120 \times 10 \times 60 = 10800 \text{ J}$$

12. Some of the characteristics of 4 electrical appliances are given below.

Appliance	Characteristic
1	120 V, 10 A
2	240 V, 6 A
3	120 V, 1500 W
4	240 V, 1.8 kW

$$E = IVt$$

$$E = Pt$$

If each appliance is used for the same amount of time, which appliance consumes the most electrical energy?

- A) 1    B) 2    C) 3    D) 4