

Electrical Power 2

Name & Set

- 1 (a) Make a list of 5 household devices that use electrical energy.
In each case give the useful form of energy into which the device transfers the electrical energy.

	Appliance	power	p.d.	correct fuse	Useful energy
A					
B					
C					
D					
E					

- 2 The power of a lamp is 60W.

(a) How much electrical energy is transferred by the filament of the lamp in 1 hour?

[2]

(b) Into what form does the filament transfer electrical energy?

[1]

The average filament lamp transfers 5% of the electrical energy into light.

(c) What becomes of the remaining 95% of electrical energy?

[1]

(d) Given that the purpose of a lamp is to provide illumination, how efficient is it?

[3]

- 3 An electric kettle has a heating element rated at 2200W, 240V. It takes 3 minutes to boil some water.

(a) Into what form of energy does the element transfer electrical energy?

[1]

(b) How much energy does the element transfer in one second?

[2]

(c) How much energy is transferred by the heating element in 3 minutes?

[2]

(d) Is *all* the energy calculated in (c) used to boil the water? Explain your answer.

_____ [2]

(e) What is the size of the current flowing through the element when the kettle is switched on?

_____ [1]

4 What is the power rating of the electric kettle in your home? Pour half a litre of cold tap water into the kettle. Time how long it takes for the water to reach boiling point. How much energy has been used to boil the water?

5 Household lamps have a variety of power ratings. Common power ratings are 40 W, 60 W and 100 W, though it is also possible to get 25 W and 150 W lamps.

(a) Find out how many of each type of lamp you have in your home and make up a table like the one below from which you can calculate the total power of all the lamps.

Power (P)	Number of lamps (N)	Power of all lamps (P x N)
40 W		
60 W		
100 W		
Other		
	Total power of all lamps	

(b) Calculate the total current drawn from the mains when all the lamps are on at the same time

_____ [2]

6 Sometimes the power rating of an electrical device is **not** given. How could you use a voltmeter and an ammeter to determine the power of either a filament lamp or an electric motor? In the space on the right draw the circuit you would use and describe below how you would calculate the power of the lamp from the readings of the voltmeter and ammeter.

Circuit [3]

_____ [3]