Electrical power & The National Grid

Reading: pages 186-189 higher, pages 188-191 foundation

Knowledge

1. What is direct current?

2. What is the unit for power?

3. What is the equation to calculate the energy use of an appliance of a given power rating?

4. Complete the table:

Colour of wire	Voltage (V)	Function
Blue		
Brown		
Green & yellow		

5. What is the 'National Grid'?

6. What do step up transformers do?

7. Why is it cheaper to carry electricity at low current?

8. What is the equation linking power, voltage and current?

9. What is the equation linking power, resistance and current?

10. What equation links energy, voltage and charge?

Apply

1. A 1.4kW fire is connected to the mains supply. Calculate the current drawn. Give your answer to 2 sig figures.

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2. Describe how electrical power is carried from the power station to our homes. You should refer to current, and transformers in your answer and give approximate values for pd in your answer.

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3. Explain, as fully as you can, why step up transformers are used in the National Grid

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4. An 1800W oven is used for 20 minutes to cook a meal. How many minutes would a 1300W oven need to be on to do the same amount of work? Show your working and give your answer to 2 significant figures.

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5. Explain why the demand for electricity across the UK varies over the course of 24 hours

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6. A lamp with a power of 100W has a resistance of 30Ω. Calculate the current through the lamp.

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7. A mobile phone contains a 3.7V battery. 180C of charge passes through the battery as it charges. Calculate the energy transferred.

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8. Explain why you would get a shock if you touched the live wire of a plug while it is connected to the mains

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<u>Extend</u>

9. The charge that flows through an electric shower in 10 minutes is 18000 C. The shower has a power of 7.5 kW. Calculate the resistance of the heating element in the shower. Write down any equations you use.

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