MR SULLY UNFOLDS PHYSICS

Electrical power, energy and the National Grid

AQA 4.2.4
Electricity · Paper 1
Foundation & Higher

Name _____ Class _____ Date _____

Appliances transfer energy electrically. How much depends on their **power** and how long they are on.

KEY EQUATIONS

P = V I
P = I² R
power (W), p.d. (V), current (A), resistance (Ω)

E = P t
E = Q V
energy (J), time (s), charge (C)

Section A · Recall and calculate

Grade 4–5

1 A toaster draws 4 A from the 230 V mains. Calculate its power. [2]

2 A 60 W lamp is on for 100 s. Calculate the energy transferred. [2]

3 What is the National Grid? [2]

Section B · Calculate

Grade 5–6

4 A current of 2 A flows through a 50 Ω resistor. Calculate the power. [2]

5 A charge of 300 C flows through a lamp with a p.d. of 12 V across it. Calculate the energy transferred. [2]

6 A 2.5 kW heater is used for 30 minutes. Calculate the energy transferred. [3]

Section C · Stretch

Grade 7+

7 A 1150 W kettle runs on 230 V mains. Calculate the current and the resistance of the heating element. [4]

Exam-style question

AQA style

8 Electricity is transmitted across the country through the National Grid.

a Explain why step-up transformers are used to transmit electricity at a very high potential difference. [4]

b Explain why step-down transformers are used before electricity reaches homes. [1]

Total: _____ / 22

How confident am I?	Not yet	Nearly	Got it
I can use P = VI and P = I^2R	☐	☐	☐
I can use E = Pt and E = QV	☐	☐	☐
I can explain how the National Grid reduces the energy wasted in the cables	☐	☐	☐