Year 11 Science: Electrical energy, power and circuits

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. What current flows through a 12 Ω resistor with 6.0 V across it?

2. A toaster draws 4.0 A from the 230 V supply. What is its power?

3. How much energy, in joules, does that toaster use in 3.0 minutes?

4. What does it cost to run a 2.0 kW heater for 3 hours at 42.1 c/kWh?

5. A 9 W LED gives the same light as a 60 W incandescent bulb. By what percentage is its power lower?

Exam-style question: the hair dryer

Ari's hair dryer is rated at 1800 W on the 230 V mains supply. She uses it on high for 10 minutes every day. Electricity costs 42.1 cents per kWh.

6. Describe the energy changes in the hair dryer.

7. Calculate the current in the hair dryer on high, with a unit.

8. Calculate how much it costs Ari to use the hair dryer for a year.

9. On the low setting, the heating element has a higher resistance. Discuss how this changes the current, the power and how long Ari takes to dry her hair.

Fix the mistake

10. Correct this statement: "A 2 kW heater for 3 hours: E = 2 × 3 = 6 J."

11. Correct this statement: "Current gets used up by the heater, so less comes out than goes in."

12. Correct this statement: "A bigger resistance means a bigger current, because the resistor works harder."

13. Correct this statement: "Power and energy are the same thing, both in watts."