Energy Bills and Kilowatt Hours

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

A 1.5 kW heater is on for 2 hours. How many kWh is that?

Step 1 · Formula

Energy (kWh) = power (kW) × time (h).

Step 2 · Calculate

1.5 × 2 = 3 kWh.

Answer: 3 kWh

Check: Power must be in kW and time in hours.

2. Now try one with the steps

Electricity costs 25p per kWh. How much do 3 kWh cost?

Step 1 · Formula

Step 2 · Calculate

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What unit of energy is used on electricity bills? [1]

2. Write 500 W in kilowatts. [1]

3. A 2 kW heater is on for 3 hours. How many kWh does it transfer? [1]

4. A 0.5 kW games console is used for 4 hours. How many kWh is that? [1]

5. Electricity costs 25p per kWh. What is the cost of 6 kWh, in pence? [1]

6. A meter reading goes from 12345 to 12480. How many kWh were used? [1]

7. Using your answer to the last question, find the cost at 25p per kWh, in pounds. [2]

8. A 3 kW kettle is used for 6 minutes (0.1 h) each day. How many kWh does it transfer in one week? [2]

9. How many kilojoules are in 1 kWh? [2]

10. A 9 kW electric shower is used for 10 minutes a day. At 25p per kWh, what does this cost each day, in pence? [3]

11. Why are electricity bills measured in kWh rather than joules? [1]

12. A family uses 1200 kWh of gas in a month. Gas costs 7p per kWh. What is the cost, in pounds? [2]

13. An 8 W LED bulb replaces a 60 W filament bulb. It is used for 5 hours a day for 30 days. At 25p per kWh, how much money is saved, in pence? [3]

14. Suggest two ways a family could reduce its electricity bill, and explain how each one works. [2]

4. Before you hand it in

Using watts in the kWh formula: 60 W × 5 h = 300 kWh.
Convert first: 60 W = 0.06 kW, so 0.06 × 5 = 0.3 kWh.

Using minutes: 3 kW × 20 min = 60 kWh.
20 minutes = 20 ÷ 60 = 1/3 h, so 3 × 1/3 = 1 kWh.

Thinking kWh is a unit of power.
kW = how fast energy is used. kWh = how much energy is used.