

GCSE Physics B (Twenty First Century Science)
J259/01 Breadth in Physics (Foundation Tier)

Question Set 13

1 A toothbrush uses a rechargeable battery.

(a) The energy that is stored in the battery comes from a power station.

State how the energy is transferred from the power station to the chemical store in the battery. *Energy is transferred electrically*

[1]

(b) The potential difference across the battery is 1.2V.

During a typical use, 360C of charge moves through the toothbrush motor over a time of 2 minutes.

(i) Calculate the total energy transferred by the toothbrush in one day if it is used **two** times a day.

$$E = QV = 360 \times 1.2 = 432 \text{ J}$$
$$432 \times 2 = 864 \text{ J}$$

Energy transferred = *864* J

[3]

(ii) Calculate the current in the toothbrush when used for 2 minutes each time.

$$Q = It \text{ so } I = \frac{Q}{t} = \frac{360}{2 \times 60} = 3 \text{ A}$$

Current = *3* A

[4]

Total Marks for Question Set 13: 8

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