Do not write outside the box

0 2 **Figure 3** shows a mobile phone being recharged by a portable power source.

Figure 3

0 2 . 1 Why does the battery in the phone need recharging?

[1 mark]

Tick **one** box.

The store of chemical energy in the battery has reduced. ☐

The store of thermal energy in the battery has reduced. ☐

The store of kinetic energy in the battery has reduced. ☐

The store of gravitational energy in the battery has reduced. ☐

Question 2 continues on the next page

Do not write outside the box

0 2 . 2 The power source provides a current of 1.86 A at a potential difference of 3.90 V

Calculate the power of the power source.

Use the equation:

power = potential difference × current

Choose the correct unit from the box.

[3 marks]

C	**J**	**W**

Power = _____

Unit _____

Do not write outside the box

0 2 . 3 A student needs a new power source.

Figure 4 shows three different sized power sources.

Figure 4

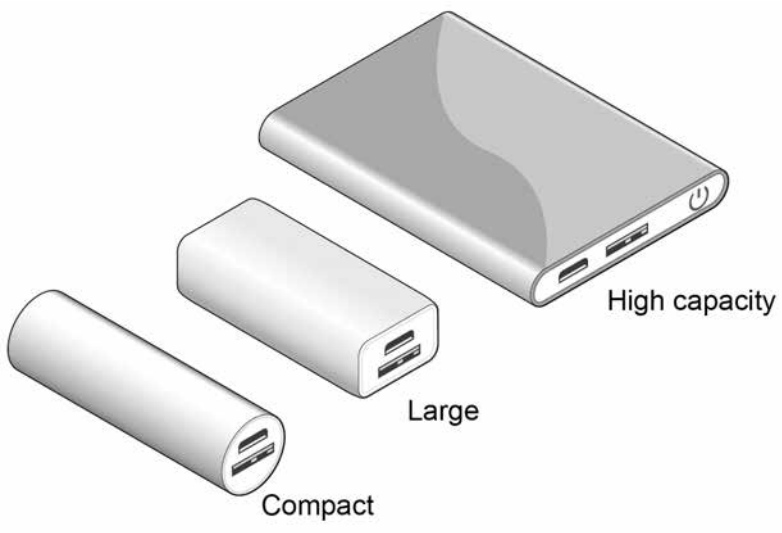

Table 1 gives data about the different power sources.

Table 1

Power source	Number of charges	Mass in grams
Compact	1	100
Large	5	200
High capacity	10	600

The student chose the large power source.

Suggest why the student chose the large power source.

[4 marks]

8

Turn over ►

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	the store of chemical energy in the battery has reduced		1	AO1 6.2.4.2
02.2		an answer of 7.254 scores **2** marks		
	P = 3.90 × 1.86		1	AO2 6.2.4.1
	P = 7.254	allow 7.25 or 7.3	1	AO2 6.2.4.1
	W		1	AO1 6.2.4.1
02.3	**comparison with compact power source**			AO3 6.2.4.2
	5 times as many charges		1	
	(only) twice the mass	allow (only) twice as heavy as the compact	1	
	comparison with the high capacity power source			
	although half the number of charges		1	
	(only) one third the mass	allow (only) a third as heavy as the high capacity	1	
	or			
	calculation of charge / mass ratio for large power source	allow mass / charge ratio		
	$= \frac{5}{200}$ (1)	$= \frac{200}{5}$		
	= 0.025 (1)	allow 40		
	calculation of charge / mass ratio for high capacity and compact power sources (1)	allow mass / charge ratio		
	charge / mass ratio greatest for large source (1)	allow lowest mass / charge ratio		
Total			**8**	