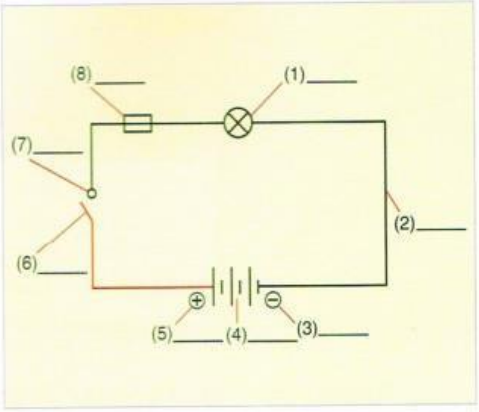
2 Electrical circuit



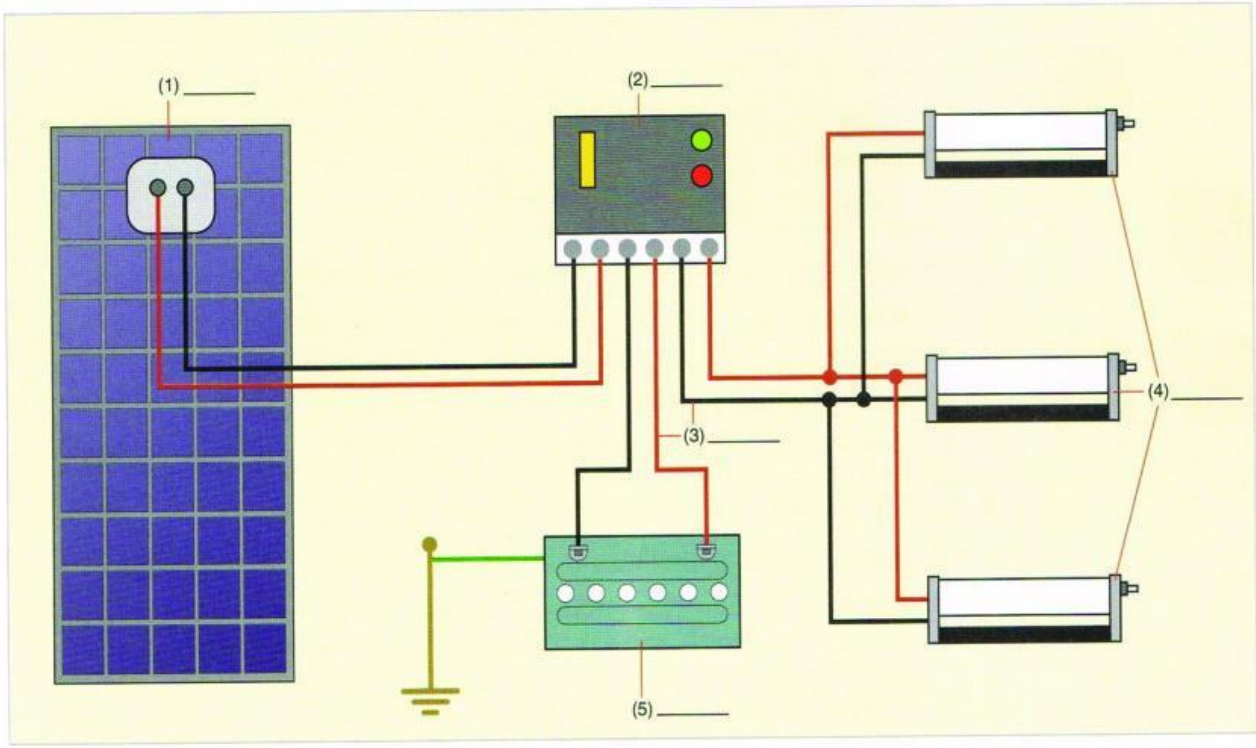
Start here **1** Do you know these electrical symbols? Label the circuit diagram with the words in the box.

battery conductor fuse lamp
negative positive switch terminal

See the glossary of electrical symbols on page 109 for answers.

Listening **2** 28 Listen and label the diagram with the words in the box.

battery cables controller lamps solar panel



3 29 Listen and match the items with their specifications.

1	solar panel	a)	12V 8W
2	controller	b)	DC
3	battery	c)	5A
4	lamps	d)	60W
5	electrical current	e)	12V 100Ah

Task **4** Work in pairs. Look again at the diagram in 2. Where does the current flow in these three situations? Draw arrows.

Situation 1: The Sun shines. The lamps are on.
Situation 2: The Sun shines. The lamps are off.
Situation 3: The Sun doesn't shine. The lamps are on.

convert = change

5 Read the manual for the solar panel and check your answers to 4.

How does the solar power system work? The panel converts the Sun's energy into a DC electric current. The current flows to the controller. Then it can flow from the controller to the lamps. Or it can flow from the controller into the battery. The battery stores the electricity. The current can flow from the battery into the lamps through the controller.

If the Sun shines, the DC current can flow from the panel, through the controller and into the lamps. If the Sun doesn't shine, the current can flow from the battery, through the controller and into the lamps. If the lamps are off, the current can flow from the panel, through the controller, and into the battery.

The controller controls the flow of the current. If the battery is full, the controller stops the flow from the panel into the battery. If the battery is empty, the controller stops the flow from the battery into the lamps.

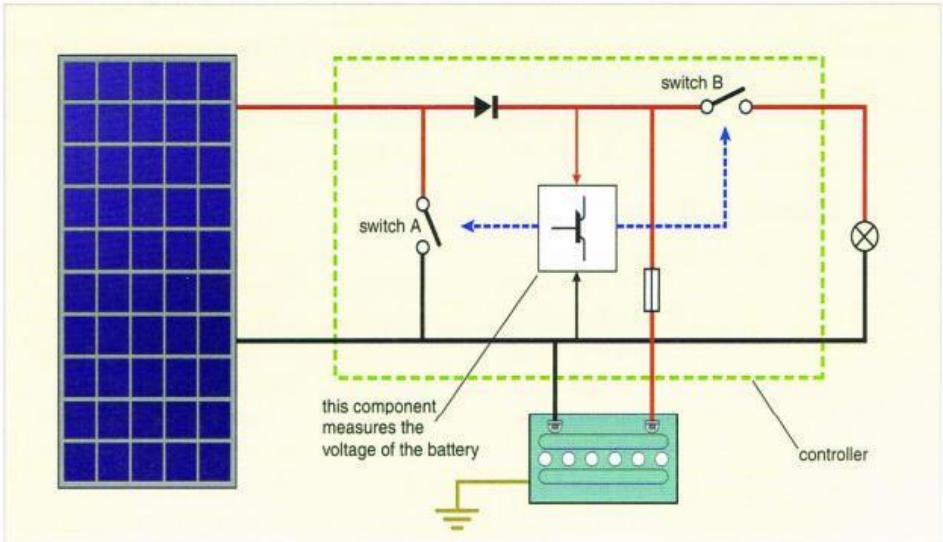
Task

6 Work in pairs. How do you think the controller below works? Make notes.

7 Complete the text explaining how the controller works. Choose the correct verb and use the correct form of the verb.

If the battery is full, switch A (1) _____ (open/close). Then the current (2) _____ (flow/not flow) from the panel to the battery. The controller short-circuits the panel.

If the battery is empty, switch B (3) _____ (open/close). Then the current (4) _____ (flow/not flow) from the battery to the lamp.



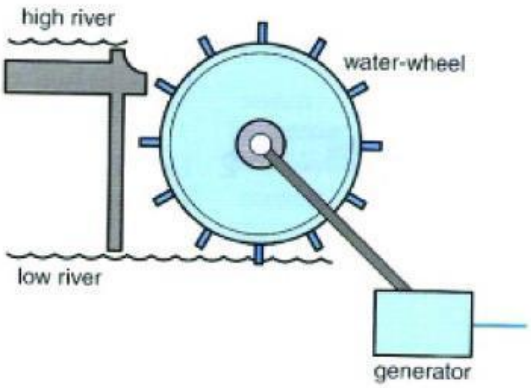
2 Electrical circuit

1 Match the words in the box to sentences 1–7.

battery cable controller lamp solar panel electrical current switch

1 shines a light when the switch is on: *lamp*
2 converts the sun's energy into an electrical current: _____
3 stores electricity: _____
4 When a _____ is closed, the electrical current can flow.
5 DC is a type of _____.
6 Electricity passes through the _____ to the lamp or the battery.
7 carries the electrical current: _____

2 13 Look at the diagram for a water-wheel and a generator which supplies current to a workshop next to the river. Complete the sentences with the present simple. Then listen and check your answers.



1 If the river is high, and the workshop is open, *the current flows from the generator into the workshop.* (current / flow / generator / workshop)
2 If the river is high, and the workshop is closed, _____ _____. (current / flow / generator / batteries)
3 If the river is low, and the workshop is open, _____ _____. (current / flow / batteries / workshop)
4 If the river is low, and the workshop is closed, _____ _____. (current / not / flow)
5 If the batteries are full, _____ _____. (current / not / flow / generator / batteries)
6 If the batteries are empty, _____ _____. (current / not / flow / batteries / workshop)

3 14 Listen to the dialogue. Circle the correct specifications for the items.

1	Solar panels	a) 4 × 16 W	b) 40 × 60 W	c) 4 × 60 W
2	Controller	a) 1 × 3 A	b) 1 × 5 A	c) 1 × 15 A
3	Batteries	a) 4 × 12 V, 50 Ah	b) 4 × 12 V, 100 Ah	c) 4 × 15 V, 150 Ah
4	Lamps	a) 6 × 20 V, 8 W	b) 16 × 12 V, 18 W	c) 6 × 12 V, 8 W
5	Cable (12 metres)	a) 2.5 mm, 30 amps	b) 6 mm, 53 amps	c) 16 mm, 100 amps