

ACTIVITY CARDS

SUN ENERGY LAB

L1



IS ONE SOLAR PANEL ENOUGH?

1 Follow the diagram. Connect one of the middle solar panels to the appliances.

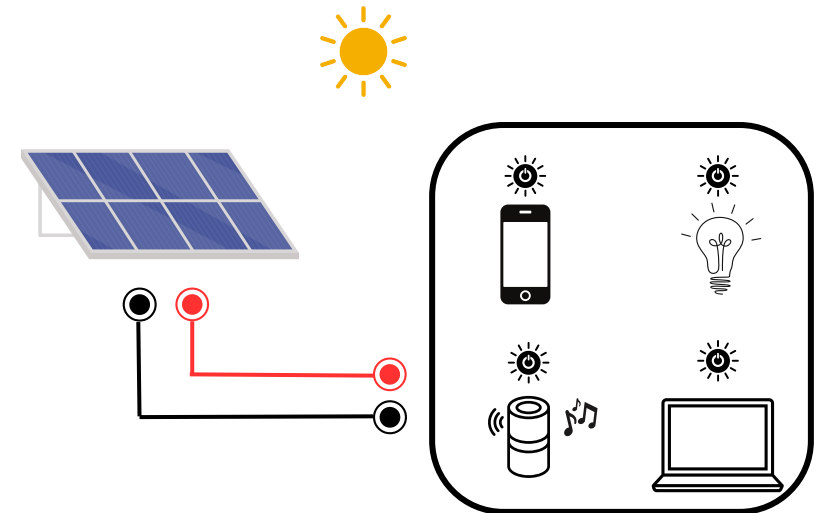
2 Switch on the sun at noon.

3 Switch on the cell phone. Look at the red light.
Can you charge the cell phone?

Yes / No

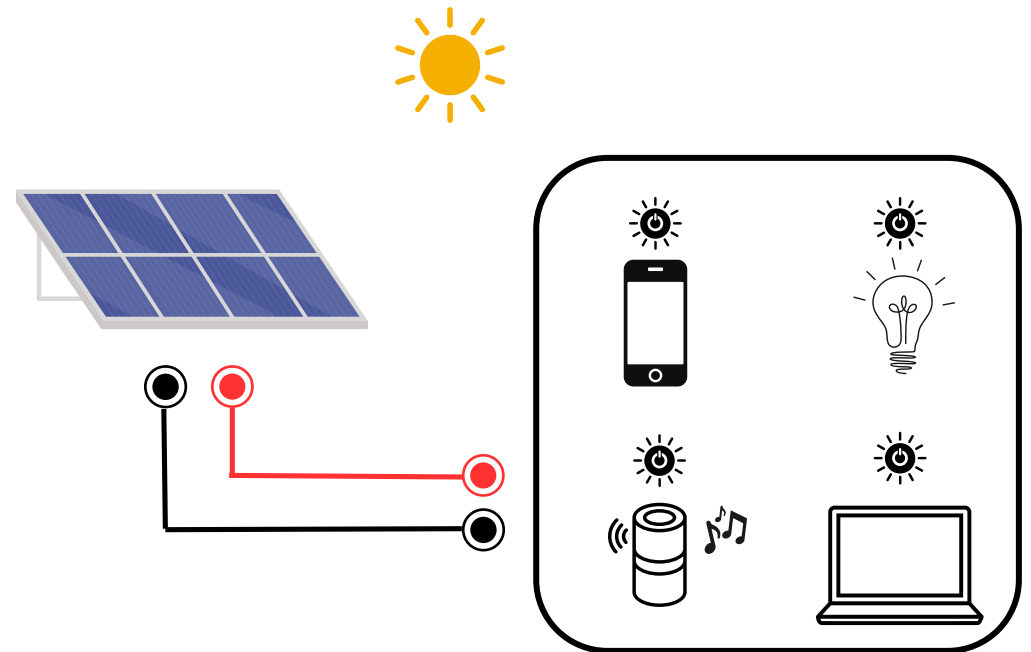
What do you think the reason is?

4 Disconnect all cables.



SOLUTION

No, one mini solar panel does not provide enough voltage to charge the cell phone.



CAN I CHARGE MY CELL PHONE WITH SOLAR ENERGY?

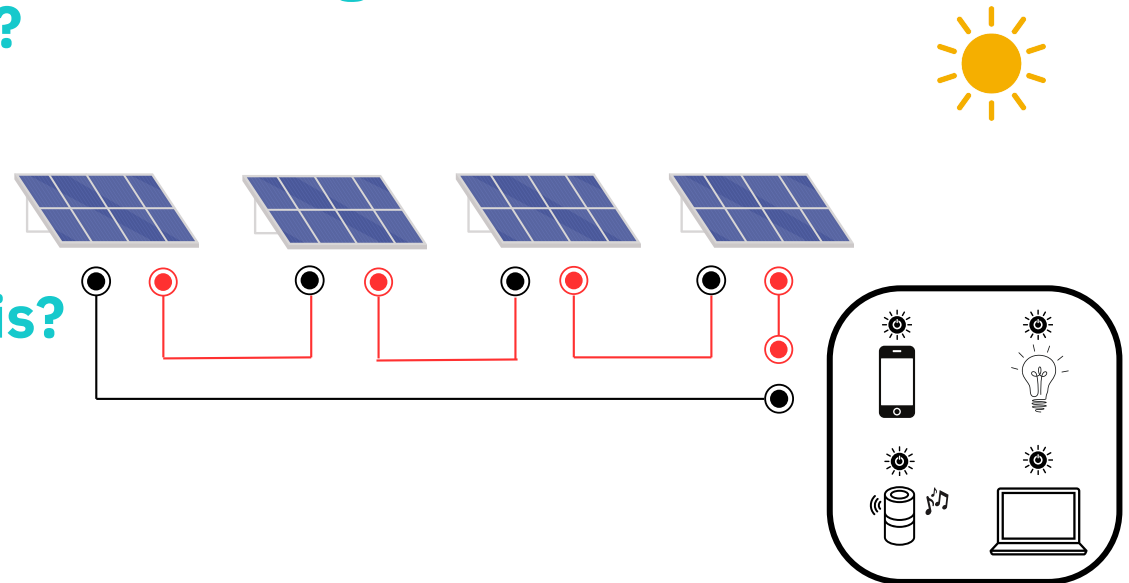
1 Follow the diagram to make a series connection.

2 Switch on the sun at noon.

3 Switch on the cell phone. Look at the red light.
Can you charge the cell phone?

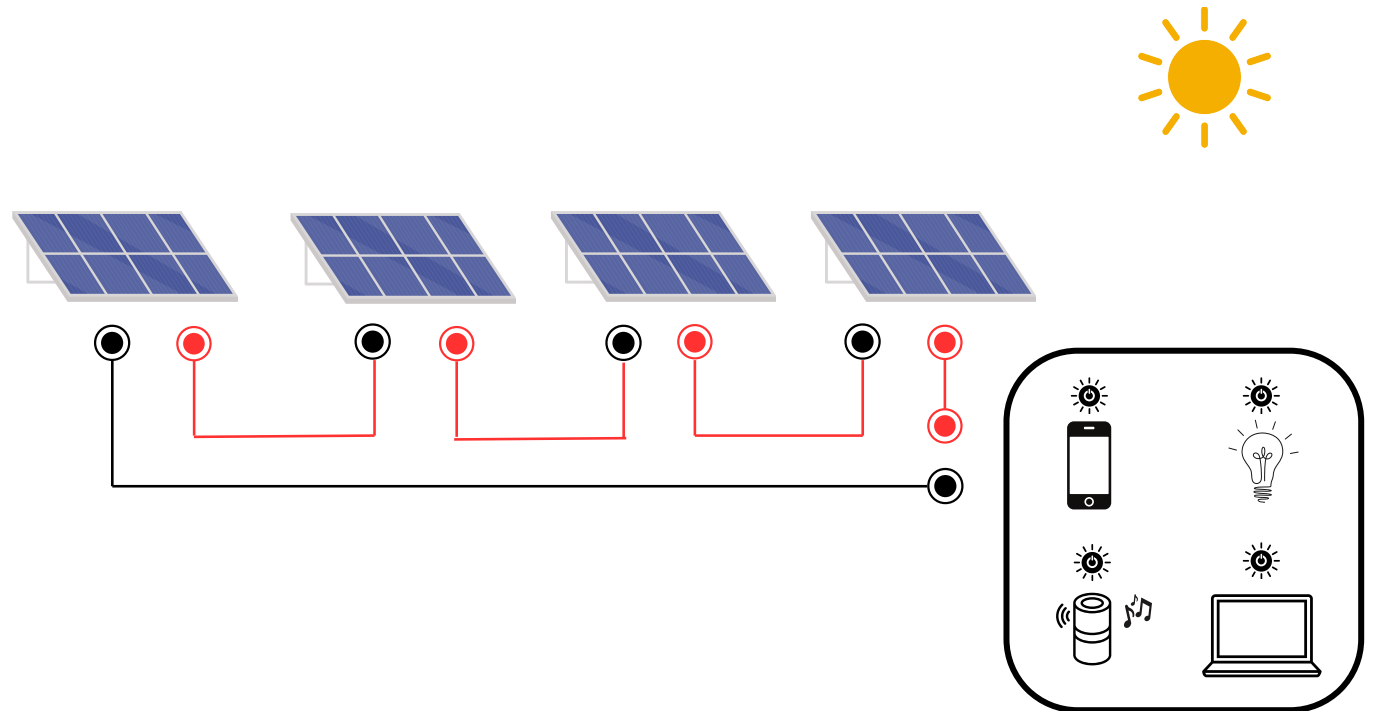
Yes / No

What do you think the reason is?



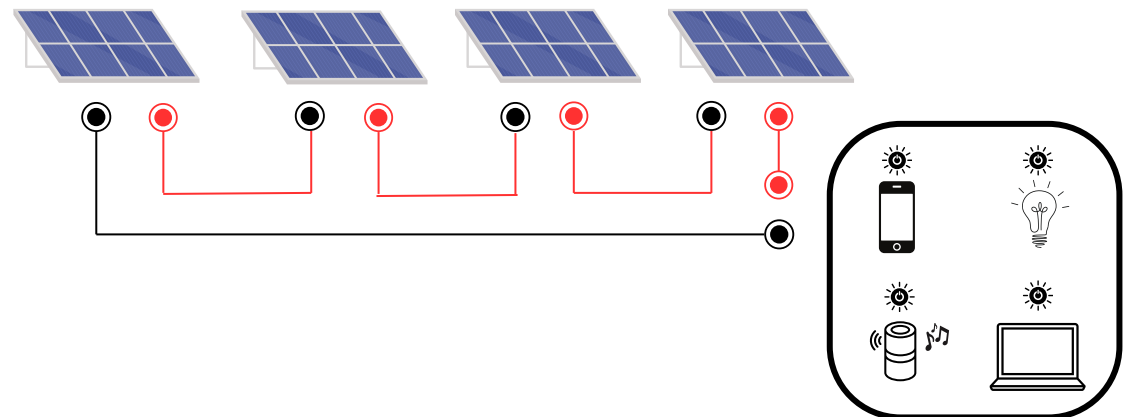
SOLUTION

Yes, 4 mini solar panels provide enough voltage at noon to charge the cell phone



WHAT HAPPENS WHEN IT'S CLOUDY?

- 1** Keep the series connection in place.
Turn on the sun at noon and look at the screen, how much voltage (V) is coming in?
- 2** Take the light cloud, hold it in front of the sun.
Look at the screen, what happens to the voltage?
What do you think the reason is?
- 3** Take the dark cloud and hold it in front of the sun.
Look at the screen, what happens to the voltage?
What do you think the reason is?



SOLUTION

In light cloud cover the voltage of a solar panel drops a little, this effect is greater in heavy clouds.

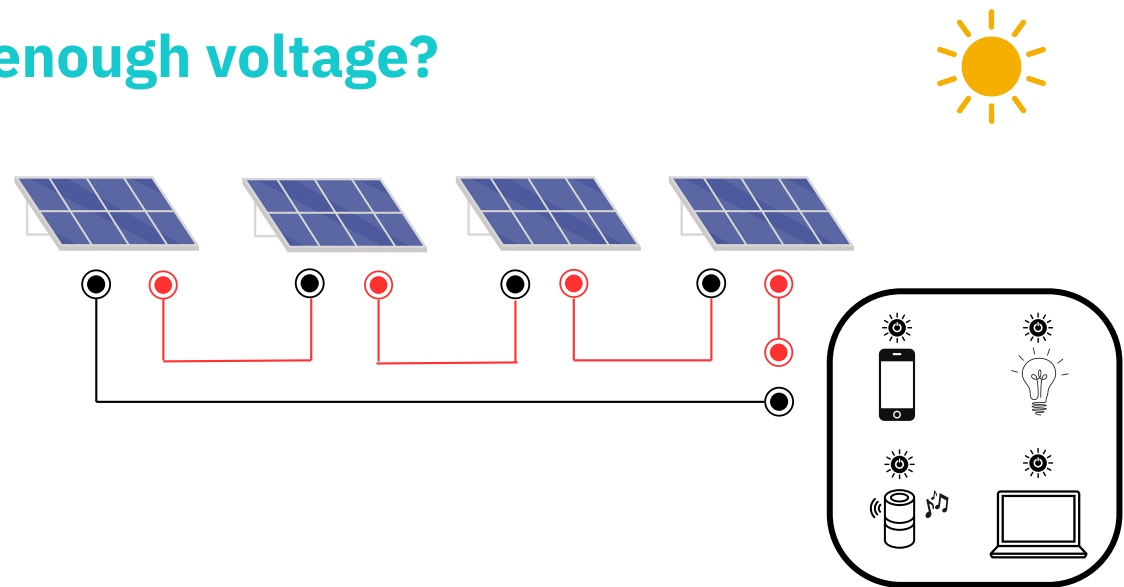
Light still comes in, the heavier the cloud cover the less light comes in.



WHAT HAPPENS IF THERE IS NOT ENOUGH VOLTAGE?

- 1** Turn on the different solar positions.
Compare the different solar positions.
Look at the red light.
Can you charge the cell phone now?
- 2** Experiment: switch on the other appliances one by one and in different combinations.
Look at the red lights.
- 3** What happens when there not enough voltage?

- 4** Disconnect all cables.



SOLUTION

When you turn on an additional appliance, the red lights become dimmer.

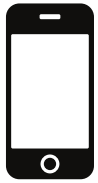
By switching on more appliances, you increase the current demand from the solar panel. However, a solar panel can only deliver a limited amount of current. As the power demand increases, the voltage drops.

Because voltage and current are linked, this drop in voltage also reduces the current through each appliance. As a result, the red lights become less bright.



LEGEND

APPLIANCES



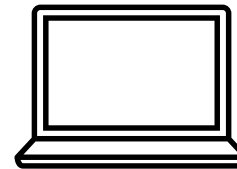
cell
phone



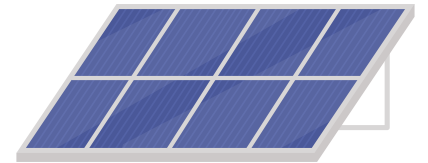
home lighting



bluetooth
speaker



laptop

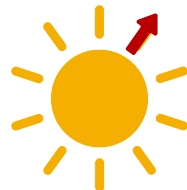


solar panel

SOLAR POSITIONS



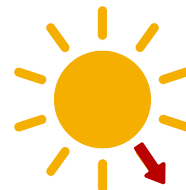
sunrise



morning



noon



afternoon



sunset

CLOUD COVER



light cloud



dark cloud

LEGEND

Voltage (V)

Voltage is like the pressure that pushes water through a garden hose — it's the force that drives electricity through a wire.

Current (Amp)

Current is like the amount of water flowing through the hose — it represents how much electricity is moving.

Power (Watt)

Power is like how strong and far the water sprays out — it depends on both the pressure (voltage) and the flow (current).

The higher the voltage (water pressure) and the greater the current (amount of water), the more power you have to make something work — like a garden hose that sprays farther.

