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# ACTIVITY CARDS

## SUN ENERGY LAB

L1

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# IS ONE SOLAR PANEL ENOUGH?

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

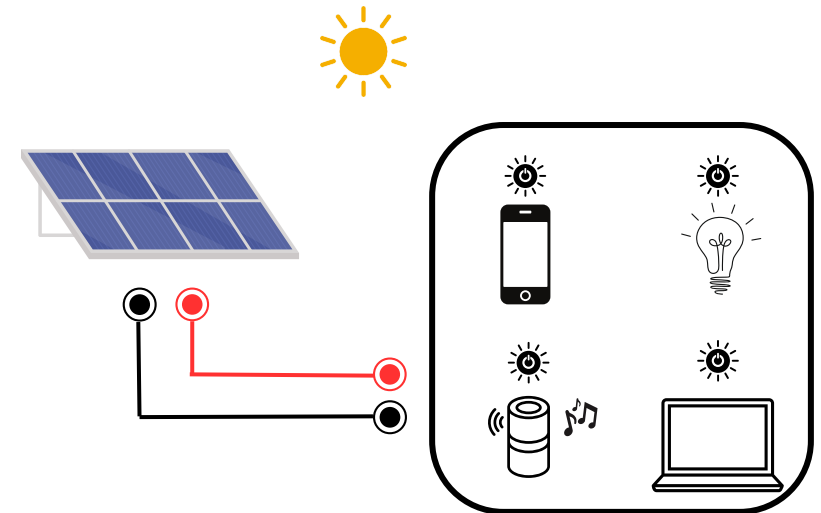
**2** Switch on the sun at noon.

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

Yes / No

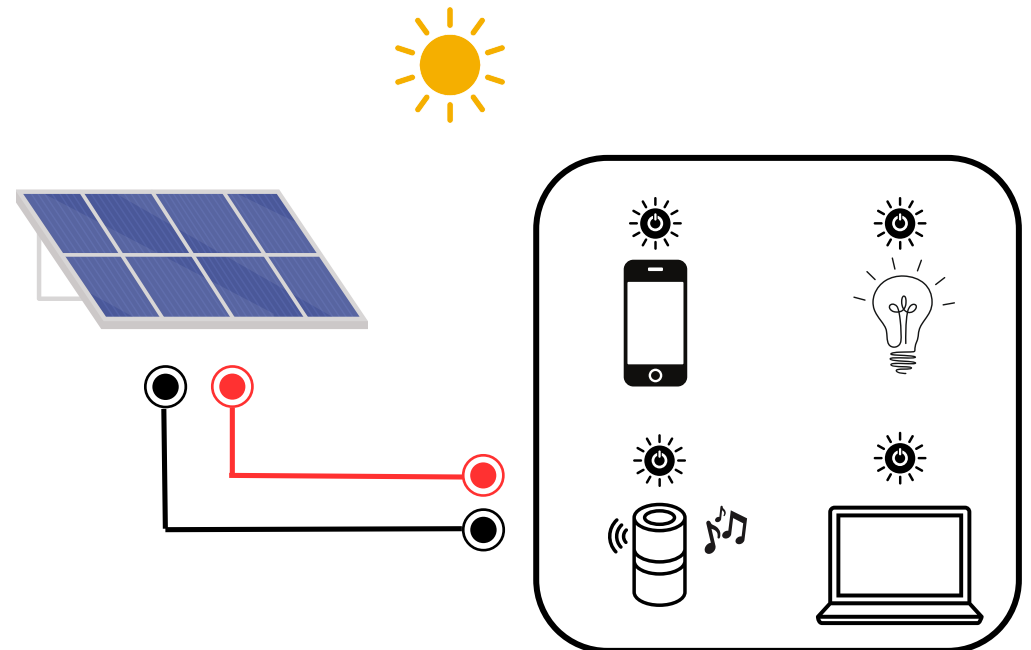
What do you think the reason is?

**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?

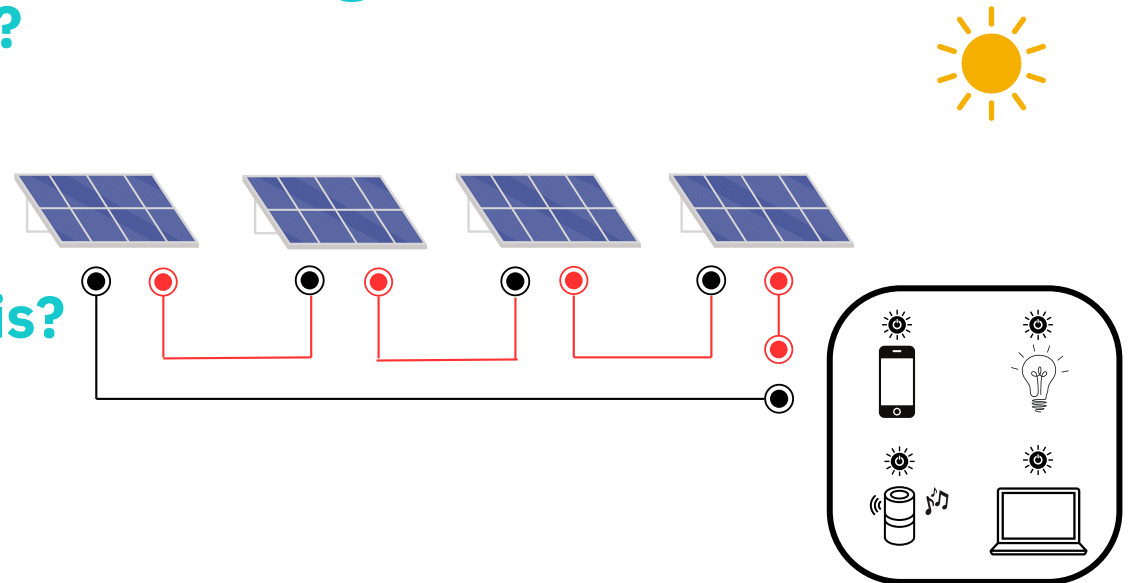
**1** Follow the diagram to make a series connection.

**2** Switch on the sun at noon.

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

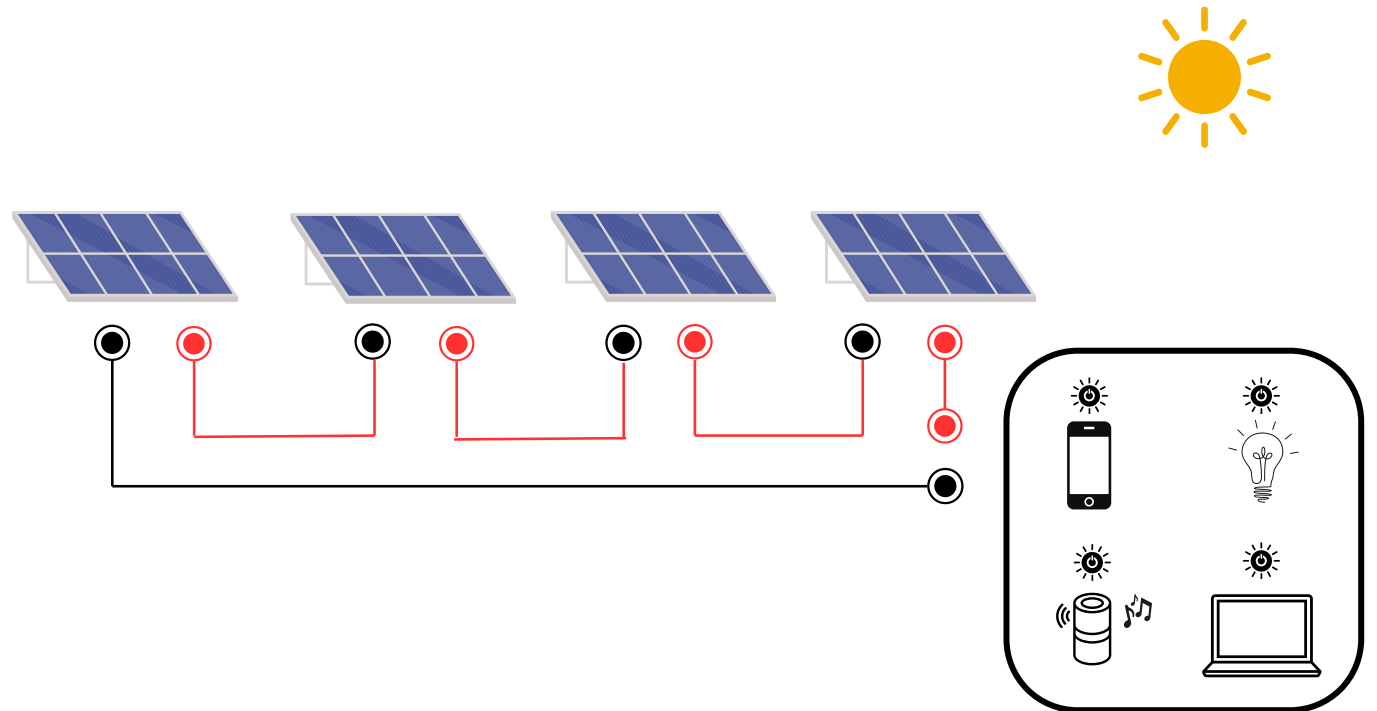
Yes / No

What do you think the reason is?



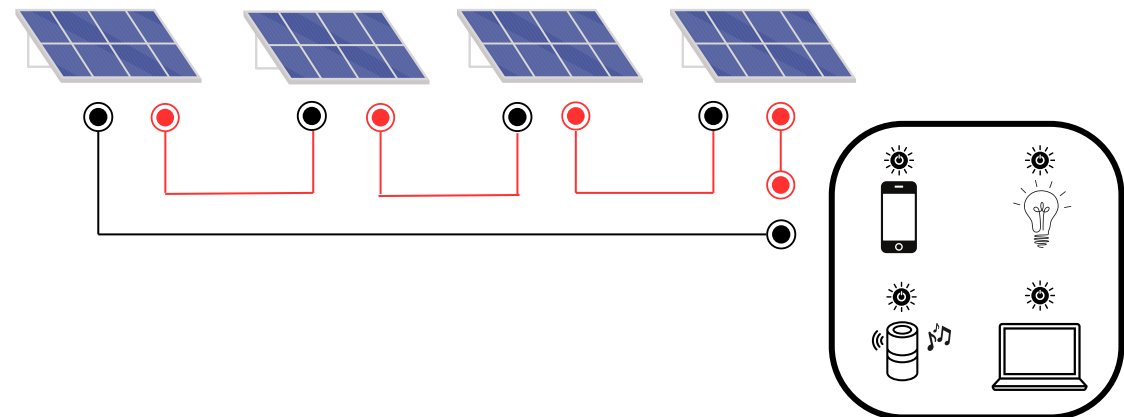
## SOLUTION

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.**

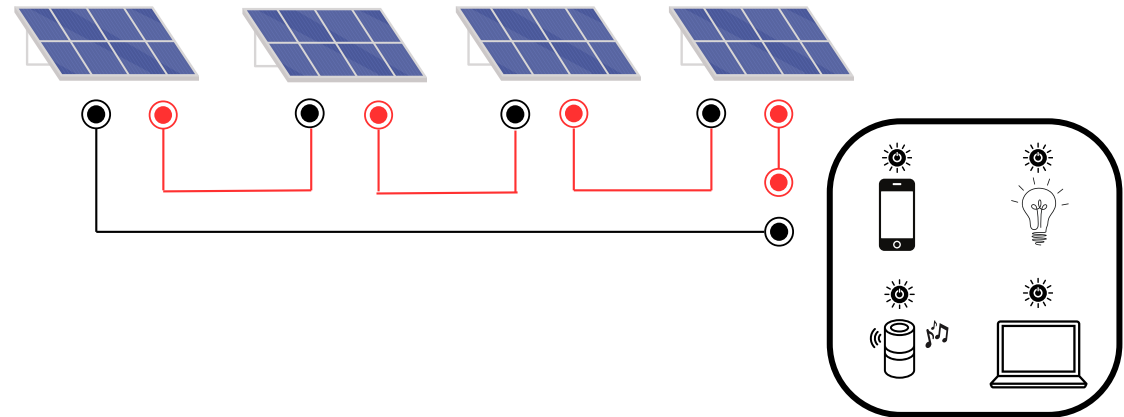
**Light still comes in, the heavier the cloud cover the less light comes in.**



# 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.

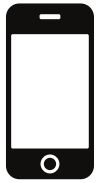
By switching on more appliances, you increase the current demand from the solar panel. However, a solar panel can only deliver a limited amount of current. As the power demand increases, the voltage drops.

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



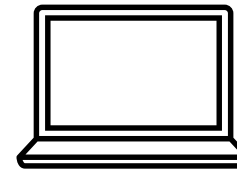
cell  
phone



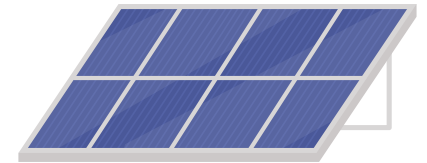
home lighting



bluetooth  
speaker



laptop

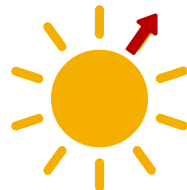


solar panel

## SOLAR POSITIONS



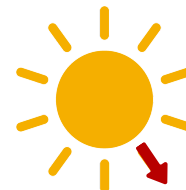
sunrise



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.*

