



# Get to know the components of a photovoltaic solar system

Age group	11 years and above
Duration	20 – 30 minutes
Group size	Up to 10 people
Location	Indoors or outdoors
Possible on rainy days	Yes
Keywords	Components, photovoltaics, solar system, function



## Short description

An independent photovoltaic (PV) solar system is more than just a solar panel and a socket, right? But do you know which components you need to build up such a PV system, as small as in a solar torch or as big as the solar system for an entire house? With this matching activity, you will learn more about the different components and understand what their function is in the system.



## Remark

It might be a good idea if the leader of this activity would read some background information about photovoltaics, to be prepared to answer questions or to give additional information to the participants. Just try to make sure not to give too technical information.



## Materials

These are the materials you need:

- Matching cards about the PV solar system, printed out and cut to card size

Optional:

- A big sheet of paper OR a whiteboard with magnets and markers



## Instructions

That's how this card game is played:

1. Mix all the cards and distribute them on a table or on the ground.
2. Put the picture cards to one side. Ask the participants for each picture what the name of this component could be. You might start with the easier ones and then move on to the more difficult ones.
3. Once you have set the pictures and the names, put the corresponding cards next to each other.
4. Ask the participants what they know about the components, what they are good for, what's their function in the solar system. (If this turns out to be too difficult, you can also read out the texts one by one and let the participants guess which component this matches to.)
5. Add the text cards to the pairs of picture and name, so you have three cards for each component (picture, name, description)

**Option for 'experts'** (this is only possible if the leader has detailed knowledge about off-grid solar systems):

Place the picture cards on the white paper or stick the cards with magnets on a whiteboard and draw the electrical connections between them. This makes it easier to understand how the elements interact and how they would be installed in a real solar system.



### Explanation and further information

Photovoltaic is the name of the process how sunlight is turned into electricity. And how does that work, what is happening inside a solar panel? In a simplified way, you can imagine that a photon (a 'light particle') from the sunlight 'hits' an electron (a 'particle of electrical charge') which starts moving within the cell and through the cables attached to them. The electrons therefore 'transport' power which can run a device – if we connect it to the solar panel.

The produced electricity can be used in two different ways: It can run a completely independent solar system (which needs a battery to store energy for the night) or it can be connected to the public power grid. In the latter case, the grid serves as virtual battery. Any excess solar electricity is delivered to the grid (and used by your neighbours), while at night, you get electricity back from the grid.



### Reflective questions

In the place where you live, do you think it would make more sense to have a grid-connected or an off-grid solar system? Why?

What are the advantages / disadvantages of grid-connected or off-grid, respectively?



### Impressions

