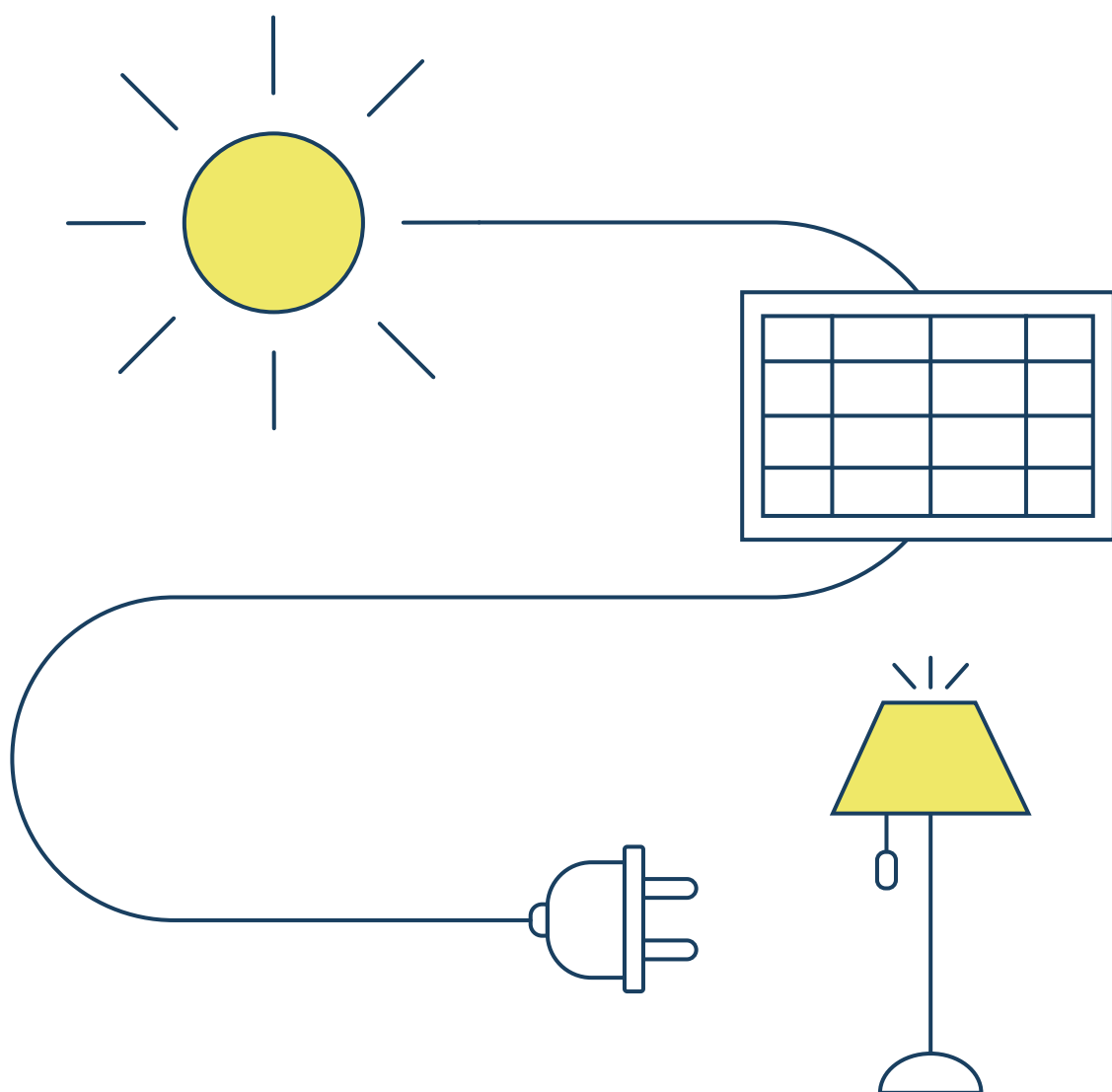


Explorer kit – Module 3: “Out to the nature”



Module 3: “Out into nature“

Topic:	Solar energy
Year:	From Year 1
Curriculum reference:	Science, nature and environment, energy, weather
Duration:	20-45 minutes (customisable)
Summary:	Module 3 “Out into nature” is the additional module of the explorer kit. The pupils can produce electricity from real sunlight using the PV system. The module takes place outside and demonstrates the previously gained knowledge in nature. The sun shines on the PV module. Depending on the sunshine and positioning of the PV module, the connected propeller rotates faster or slower and is louder or quieter.

Learning goals:

- The pupils describe their knowledge from the last experiments and make assumptions.
- The students experience that electricity can be produced from sunlight by working with the teacher using sunlight to drive the propeller and verbalising their observations.
- Pupils understand what a PV module is by working with the teacher to derive its function in converting sunlight into electricity.
- The students consolidate their knowledge from the previous experiments.
- The students reflect on their newly acquired knowledge by repeating it orally in class discussions or recording it in writing/pictures.
- The students can experiment and gain experience themselves.

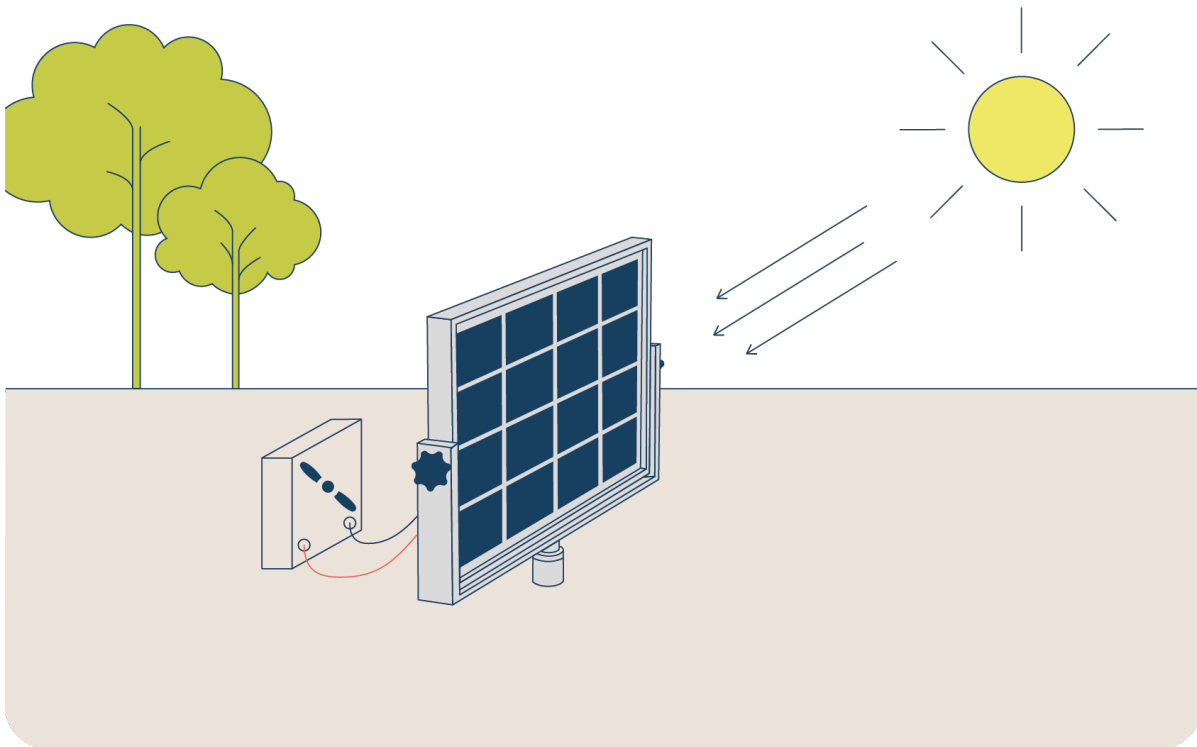
Implementation

Preparation by the teacher:

The learning game does not need to be set up. The PV module and the necessary accessories (propeller box) are carried outside.

Assembly plan:

PV module, propeller box



Lesson plan

1. Start and activate previous knowledge: Together, the students and the teacher repeat the names of the individual parts (PV module and propeller) and repeat what they have learnt from modules 1 and 2.

2. Inform: Based on the collected knowledge from modules 1 and 2, the teacher leads over to the learning game. The transition could look like this: 'What did we see in the last experiments? How could the experiment go now?'

The teacher shows the students the explorer kit and names the individual parts: PV module and propeller. They then demonstrate the explorer kit: The propeller is connected to the PV module. If the sun is shining at this time, the propeller should immediately start turning very quickly. Depending on the clouds on that day, it will turn faster or slower (cf. Module 2).

The students observe the experiment and verbalise their observations. Together with the teacher, they make assumptions about what they have observed and work out the following main conclusion: The sun's rays hit the PV module. This converts the sunlight into electricity. The electricity drives the propeller.

The pupils can carry out the experiment themselves. One student aligns the PV module with the sun, another student holds the propeller box. This is repeated until the whole class has experimented.

Electricity is therefore generated from sunlight. The teacher can support this process by asking stimulus questions or by repeating step by step.

3. Processing and reflecting: There are various ways to process and reflect on what you have learnt. These can of course be combined.

Option 1: The students and the teacher repeat what they have learnt orally by carrying out the experiment again and accompanying it verbally.

Option 2: The students and teacher work together to create a model sketch on the board and explain the individual parts and the experiment.

Option 3: The students carry out the experiments previously presented by the teacher one by one independently, so that each student has the opportunity to experiment and gain experience.

Lesson phase	Content and Activities	Media and Materials	Suggested timing
Get started and activate prior knowledge	Impulse learning game: Students and teacher name the individual parts of the learning game and repeat what they have learnt from modules 1 and 2.		5 min
Inform	<p>Realisation of the explorer kit:</p> <p>Take the PV module and propeller outside. The teacher names the individual parts and demonstrates the explorer kit. Pupils observe and verbalise their findings. Pupils make assumptions about what they have observed.</p> <p>Conclusion: A PV module is used to generate electricity from sunlight. The more sunlight shines on the module, the faster and louder the propeller turns.</p>	Learning game	10-30 min
Process and reflect	Option 1: Students and teacher repeat what they have learnt orally by carrying out the experiment again and accompanying it verbally	Learning game	5 min
	Option 2: Model sketch on the blackboard	Blackboard	5-10 min
	Option 3: The students carry out the experiments previously presented by the teacher one by one independently, so that each student has the opportunity to experiment and gain experience.		