A5.1 Solar cells – Tracking down technology

- 1. A solar module (recognizable in the photo as a rectangle with a white border) normally consists of 36 to 72 solar cells. As far as one can tell, a module in the photo has 72 cells. There are 20 modules (recognizable by the white rectangular "borders"), which makes a total of 1,440 solar cells. (Note for teachers: The exact number is not important here, only the magnitude. The students should recognize that a very large number of solar cells are needed for such a system.)
- 2. Some possible guesses: Solar cells provide only low voltage (0.5-volt solar cells are used in the experiment). The solar cells must be connected together to achieve the high voltages necessary in a home or for feeding into the power supply grid.
- To achieve high voltages: connect in series.
 To achieve high currents: connect in parallel.
- 4. "Photo" comes from the Greek word for "light." "Voltaic" is derived from volt, the unit of measurement of electric voltage.
- 5. Bicycle dynamo
- 6. The dynamo delivers "current." However, it does so according to a different principle from a solar cell: The dynamo converts the mechanical energy contained in the rotary motion of the wheel to electrical energy (current) with the aid of a magnet.
- 7. The dynamo has two terminals the first is a cable connection and the second is made via the dynamo housing, which is connected directly to the bicycle frame. The dynamo housing and the bicycle frame serve as a second "cable," so to speak.
- 8. When the dynamo is on, some of the energy contained in the movement of the wheel is used by the dynamo and converted to electrical energy. The wheel provides kinetic energy to the dynamo. It receives more kinetic energy through additional pedaling.