# Solution sheet model 1 – Solar energy

## Topic task

1. White surfaces reflect the sunlight back. Dark surfaces absorb the sunlight and store it in the form of thermal energy. Because of this a black car gets hotter faster in the sun than a white car. Solar modules are dark so that they can absorb as much light as possible and convert it into electricity.
2. a) Solar collectors generate warmth and heat  
   b) Solar thermal power stations generate electrical power by converting heat into water vapour  
   c) Solar cookers or solar ovens heat food  
   d) Solar cells generate electrical current

## Experimental task model 1

1. The optimal angle of incidence is 90 degrees to the light source. Then the sun shines vertically on the solar module at a right angle. The correct alignment and tilt of the solar modules to the sun is important for optimal power generation. Therefore, a solar module should always be exposed to sunlight as directly as possible. The optimal tilt for central Europe is 30° to ensure the sunlight can hit the module vertically.
2. The motor with rotating indicator slows down. On cloudy days with low light intensity, the solar module generates less electricity.
3. Solar power is direct current, as in a battery. It always flows in one direction, either “left” or “right”. Household outlets, in contrast, provide alternating current. With alternating current, it makes no difference if the plug of a mixer or vacuum cleaner is inserted the wrong way. The rotational direction of the motor does not change. Certain devices, such as TVs, require direct current. In this case, a built-in rectifier converts the alternating current from the outlet into direct current.