



What use is solar power?

Use the Sun

time

65 minutes

learning outcomes

To:

- know that we can use the Sun to generate electricity
- give examples of where solar power is used
- be able to operate a model car running on solar power
- know that a solar panel provides power just like a battery
- know what a car needs to be able to run using solar panels

end product

- a car that runs on solar power

materials needed

- photograph of solar-powered car (Appendix)
- 12 solar panels with wiring
- a solar-powered calculator
- a light bulb
- sunlight or an electric light
- construction materials for the car:
for example, LEGO Technic, other studded building bricks or materials you can use to build a car; important elements are: a drive axle to turn the wheels, cogs to turn the axle and an electric motor that can be connected to the solar panel

Preparation

For the activity **Using the Sun** you will need a solar panel with a light bulb, the photograph of the solar-powered car from the Appendix, and a solar-powered calculator.

For the activity **Make a solar-powered car** you will need a set of construction materials listed above for each pair of children.



Using the Sun 15 min.

Explain that we can convert the light from the Sun into electrical power that we can use. Show a solar panel and explain that it is made up from several solar cells. Connect the wires to a light bulb and hold the solar panel under an electric light. What happens? And what happens if you cover the solar panel, for example using your hand? Come to the conclusion that a solar panel without light does not produce power.

Ask the following question: 'What kind of things do we use solar panels for?' When the children have stopped sharing their ideas, show the solar-powered calculator and the photograph of the solar-powered car. Ask if they know how they work. The solar cells mean the calculator does not need batteries and the car does not need fuel. Explain that solar panels are also often used in satellites and space vehicles so they can generate their own power.



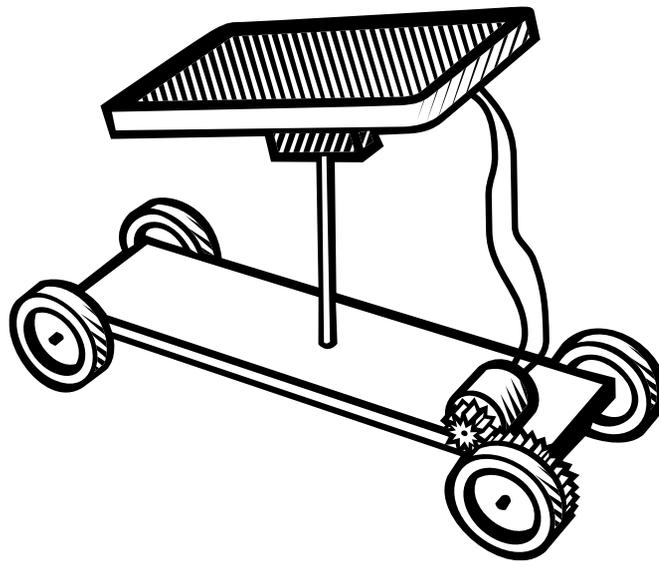
The children are going to build a solar-powered car.



Make a solar-powered car 50 min.

Organise the children into pairs. Explain to them that they are going to make their own solar-powered car. For Task 1 on the worksheet, the children draw what their car will look like. They must take into account the conditions the car needs to meet. These are described on the worksheet. It is not compulsory, but it is helpful if the children take the following points into account when designing their car:

- the car needs wheels to be able to move
- the electrical wires need to be connected to the solar panel
- the electrical wires need to be connected to the motor
- the motor needs to drive the cogs
- the cogs need to turn the drive axle that turns the wheels



Tip. If you build the car using LEGO Technic the children can connect the motor directly to the solar panel.



Give each pair a solar panel, electrical wires and the construction materials they need for their design.



To test their solar-powered car, the children place their solar panel in direct sunlight or under an electric light. Does the car go? Discuss why some cars go and some don't. Encourage the children to adjust their car until it goes.



Discuss what you need for a car to run on solar power. Encourage the children to share what they learned when making their own solar-powered car. Come to the conclusion that the solar panel converts light energy into electrical energy that drives the car.

Tip.

On a sunny day you can use the Sun instead of an electric light.



What can you do with solar power?



You are going to build a solar-powered car.

1 *Make a solar-powered car*



What do you need?

- solar panel
- sunlight or an electric light
- construction materials to build your car

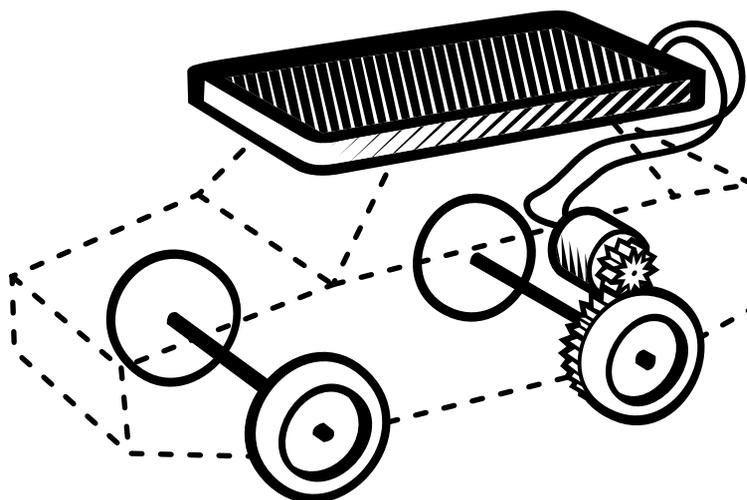
What do you need to do?

1 Think about how you want to make your car. Take the following things into account:

- the car needs to be sturdy (so it won't blow over if it is windy)
- the car needs to be able to move forwards
- the car needs to be powered by a solar panel and light

Below you can see an example of a solar-powered car.

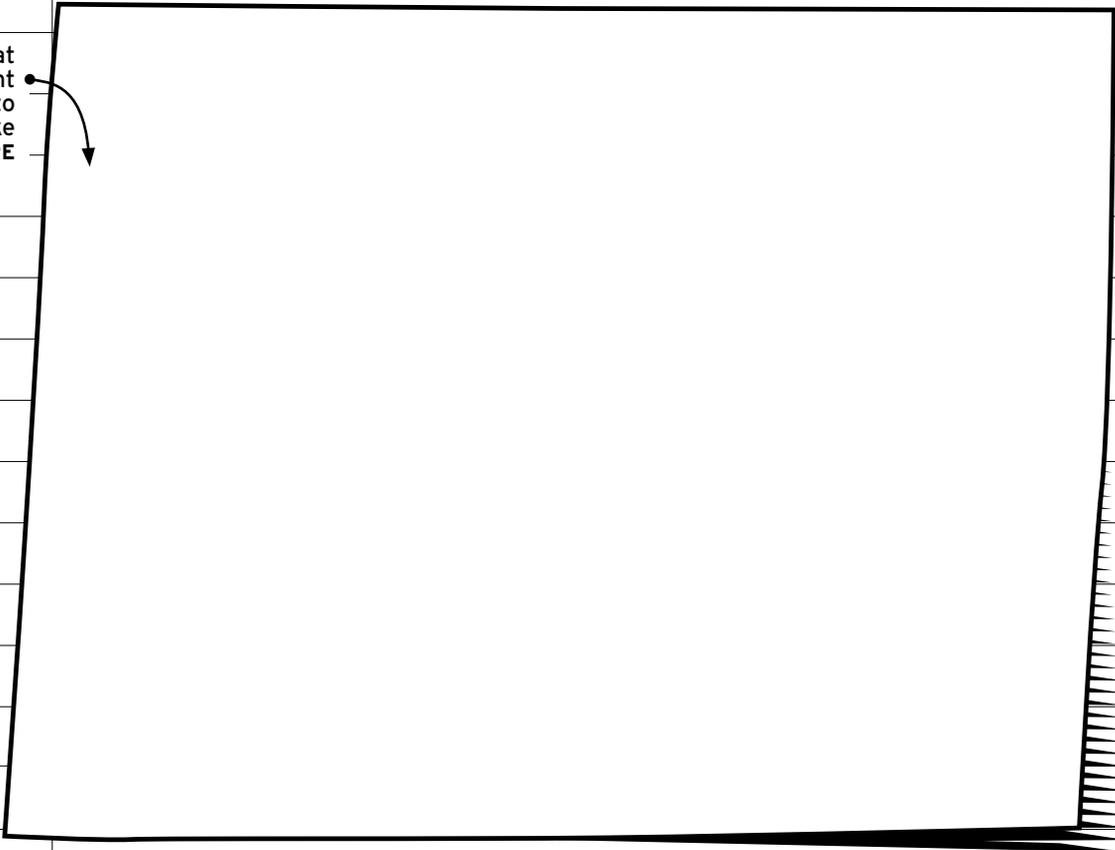
Of course your car doesn't have to look like this!



2 Draw how you want your car to look

and write what you are going to use to build the various parts.

draw what
you want
your car to
look like
HERE



3 Use your drawing and the construction materials to build your own solar-powered car!



4 Hold the solar panel under an electric light or in direct sunlight.

a

Does your car work? **yes / no**

CIRCLE
the correct
answer

b

If your car doesn't work, why not?

