

Energy

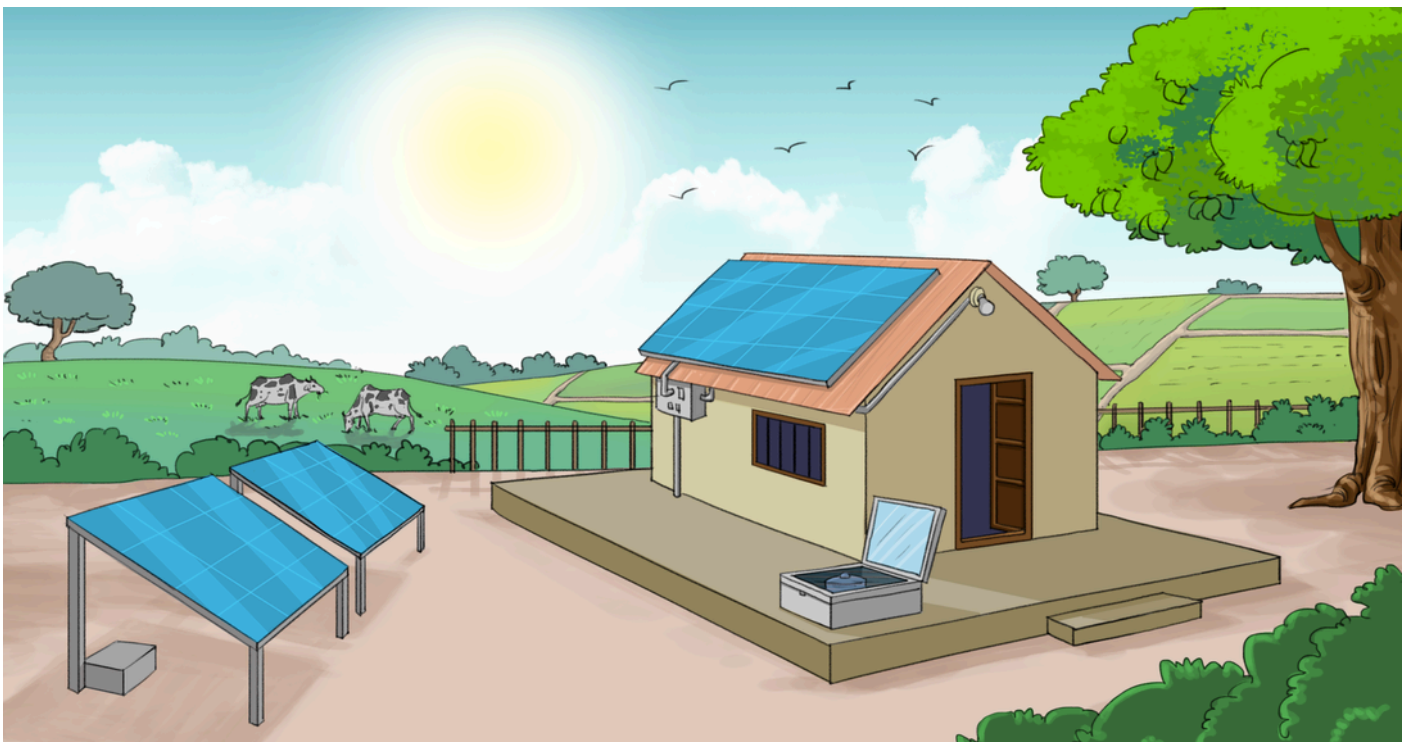
Harnessing Solar Energy: Making a Simple Solar Cooker

NCF and/or NCERT Learning Outcomes:

- To learn about renewable energy sources.
- To learn to construct a model of solar cooker using materials from surroundings and explain its working.

Why should we learn this?

This hands-on activity helps you explore real-life applications of solar energy. By building a solar cooker, you will understand how sunlight can be captured and used as a renewable energy source for cooking.



The energy we use to cook food, light our homes, and power the machines comes from different sources. Some of these sources, like coal and gas, can run out one day, while others, like the sun and wind, are always available.

These never-ending sources of energy are called renewable energy sources. Solar energy, which comes from the sun, is one such source.

Harnessing Solar Energy: Making a Simple Solar Cooker

Think and Explore

- How is solar energy used in daily life? Can you think of some examples?
- Can the sun's heat/energy be used to cook food? How do you think it works?

Now, let's explore one way to use solar energy by making a simple solar cooker that uses the sun's heat to cook food!

You need following materials

- A cardboard box of 15-20 cm height
- Black chart paper or black paint
- Transparency sheets of A4 size or transparent glass panes from a photo frame store
- 3 Steel containers with fitting lids (5-10 cm height)
- 50 grams rice
- Old newspapers
- Scissors
- Cellotape
- Scale/Ruler
- Pencil, etc.

How to conduct the experiment

1

Stick 5 to 10 layers of newspapers on the inside walls of the cardboard box. Ensure that there are no holes in the cardboard.

2

Paste black chart paper on the newspaper layer.

Harnessing Solar Energy: Making a Simple Solar Cooker

3



Cut a large window on the lid of the cardboard box and stick the transparency sheet / glass pane on it.

4



Your solar cooker is ready.

5



Stick black chart paper on the outside of one container. Or you can paint the container with black paint.

6



Place a handful of washed rice in all three containers and half-fill them with water.

7



Place the black and one unpainted container inside the solar cooker. Place another unpainted container outside the solar cooker in sunlight. This will be the 'control'.

8



Adjust the solar cooker and its lid in such a way that maximum sunlight enters the solar cooker.

9

Check the rice in all three containers at time intervals of 20 min, 40 min, 1 hour, 2 hours.

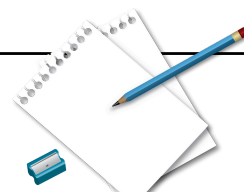
Harnessing Solar Energy: Making a Simple Solar Cooker

Observe and fill the table

- 1 Compare all three containers and record observations in the table use terms: the slightly warm, partially cooked, rice still hard, soft, fully cooked, decreased water level, water fully absorbed, etc.

| Time | Black Container (Inside Cooker) | Unpainted Container (Inside Cooker) | Unpainted Container Outside Cooker (Control) |
|------------|---------------------------------------|--|---|
| 20 minutes | (e.g. water warm, rice slightly soft) | (e.g. water warm, rice unchanged) | (e.g. no visible change) |
| 40 minutes | | | |
| 1 hour | | | |
| 2 hour | | | |

- 2 Draw a solar cooker in your notebook, showing sun's rays.



Now, Think and Discuss:

1. In which container will the rice get cooked first? And why?
2. What is the role of black colour in the solar cooker?
3. Is your solar cooker functioning as expected? If not, what might be the reasons? And what is the limitation of this solar cooker?
4. What modifications can be made to this solar cooker to cook food faster?
5. What are the other ways to harness solar energy?

