

Surya Shakti: National Renewable Energy Literacy Programme

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Partner: Metafin

End Goal: Empower over 10,000 low-income schoolchildren with certified energy literacy, publish measurable outcomes, scale a national curriculum, secure press visibility, and build institutional partnerships.

MODULE 1: Introduction to Energy & Climate

Aim: Understand types of energy, renewable vs. non-renewable, climate basics

Components: Short story, worksheet, assignment

Short Story: "Neha's Night Without Light"

The lights flickered once, then stopped completely.

Neha stared at her homework, the room now completely in darkness. "Power cut again?" she groaned. It was the third time this week. Her younger brother, Arjun, cried in the next room, frightened by the sudden quiet.

That night, her family huddled in the living room with candles and battery-powered flashlights. Without fans, the air grew stuffy, despite the windows being open. Her father said the electricity board was doing repairs on the area's electrical grid – the power would be back within a few hours. But Neha had questions: why did the power go out so often? Why was everything so dependent on it?

The next morning, still without power, Neha decided to find answers for herself. At school, she asked her science teacher, opened up her Science textbooks; at home, she borrowed her cousin's internet hotspot to search on YouTube. That's when she discovered something shocking: most of their electricity came from burning coal and diesel. It was expensive, limited, and bad for the planet.

Neha was curious and determined. She learned about other kinds of energy that were cheaper and renewable, including solar energy—how the sun's rays could power lights, heat water, and charge batteries. "Why can't we do this at home?" she asked her parents. They exchanged skeptical glances, but encouraged her to try.

Immediately, Neha got to work.

She watched tutorials and asked her teacher for guidance. With help from her uncle, who ran a small electronics shop, Neha bought a simple solar light kit. She and her dad installed it on their terrace. That evening, when darkness fell, a gentle golden glow bathed their verandah. Little Arjun clapped with joy.

Neha's teacher, impressed by her dedication, asked Neha to lead a project at school with the aim of building basic solar-powered phone chargers and water heaters using simple solar panels, scrap ply wood, and some help for soldering and wiring from Neha's uncle. Her classmates joined in and they were able to create usable solar

powered tools for their own households. With the help of their principal, they even reached out to a solar power loan financing agency and secured a loan for the school to install solar panels on the roof.

Back home, Neha convinced her family to install more panels. With savings on their electricity bills, they could now buy better batteries and lights.

A few months later, during another city-wide outage, Neha's house remained lit, cool, and cheerful. Neha sat by her desk, writing in her science notebook by her solar lamp's soft light.

Her parents smiled proudly. "You've changed our lives, Neha," her mother said.

Neha beamed. "No," she said, "I just stopped waiting for the light, and decided to bring it instead."

Worksheet 1: Energy Audit — "Where Does My Energy Come From?"

EQUIPMENT	ENERGY TYPE: RENEWABLE OR NON RENEWABLE?
Ceiling fan	
TV	
Light bulb (home)	
Light bulb (street lamp, solar-powered)	
Bicycle	
AC	
Car (fuel powered)	
Car (electric)	
Gas Cylinder	

Now that you understand the basics of renewable and non renewable energy sources for equipment and appliances in our everyday life, use the table below to draw household appliances and how they are powered!

EQUIPMENT NAME AND DRAWING	ENERGY TYPE: RENEWABLE OR NON RENEWABLE?

MODULE 2: Solar Energy: Principles

Aim: Learn how solar works (PV cells, inverter, storage), sun as energy source

Components: Informational reading, worksheet, DIY assignment

Short read (3 min): What is solar?

Solar energy is a kind of energy that is derived from the sun. It can manifest as **thermal** energy (i.e. heat) or as **electrical** energy (i.e. for solar panels). Because it is completely free and can be accessed from almost every inhabited part of the Earth, solar energy is uniquely bountiful, and is the *cleanest* form of energy we can harness.

This isn't a new technology, of course! Records from as early as the 7th Century BC show that humans have harnessed the sun's energy. The earliest known technology using solar power involved using glass to concentrate heat from the sun to produce fires. Roman and Pueblo architecture also included large windows that allowed for the sun's heat to naturally increase the temperature of the rooms so that people could stay warm for longer hours.

The first solar collector was made by the Swiss scientist, Horace de Saussure, in 1767; in the early 1800s, this solar collector was used to cook food. Since, many scientists and discoveries have expanded on this idea to develop photovoltaic cells: cells that use solar energy to create usable energy.

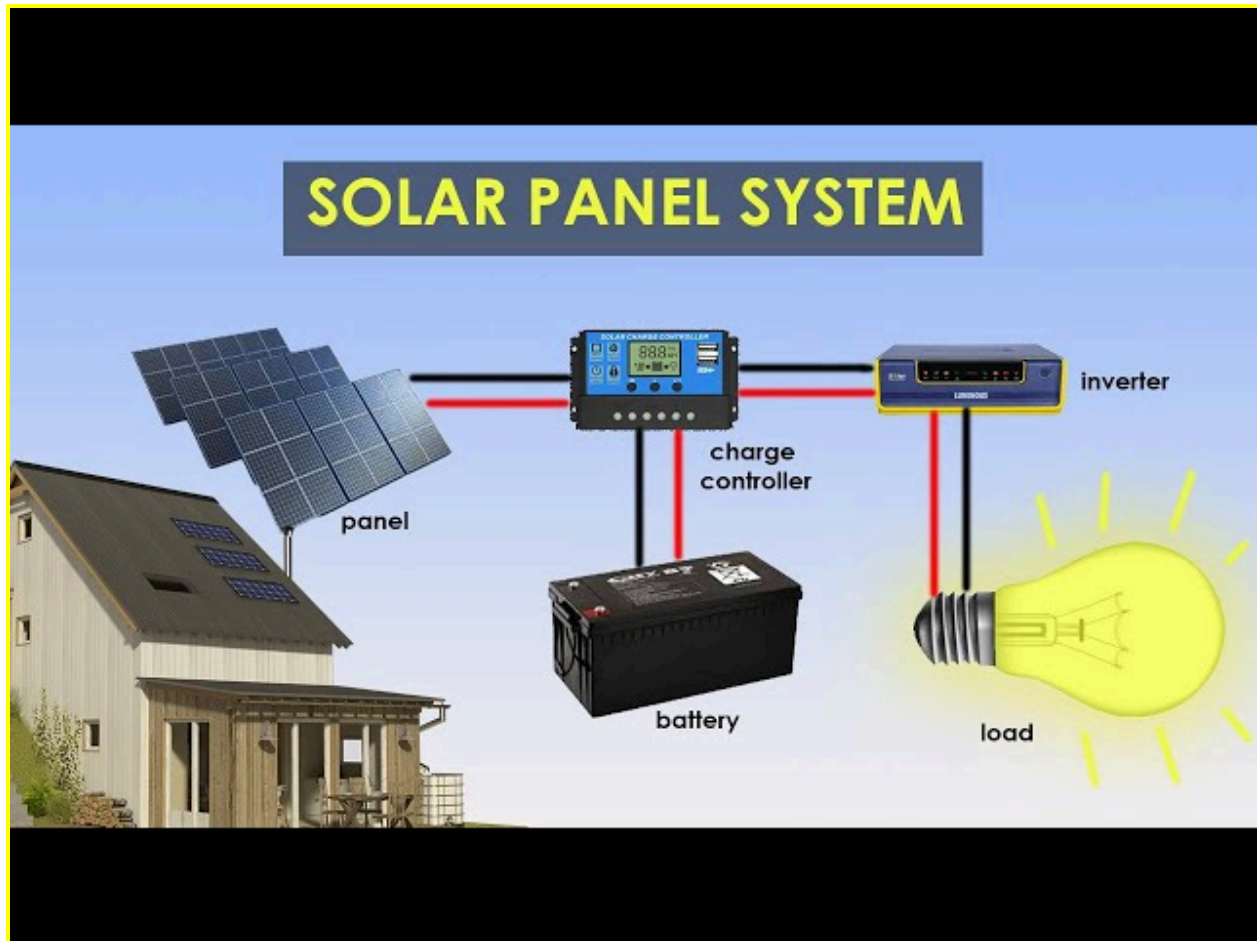
The modern version, which you might already be familiar with, is solar panels, which can now create energy that can power all appliances that run on electricity in our homes: this could be your lights, fans, and even your fridge!

How exactly does this work? Well...

- 1) Sunlight hits a solar **panel**
- 2) Photovoltaic cells convert this sunlight into direct current (DC) electricity, which is channeled through a **charge controller**
- 3) This DC electricity is passed through an **inverter** and converted into alternating current (AC)
- 4) This AC can power electrical devices in our home. This is called the electric **load**.
- 5) Excess energy can be stored in a **battery** for later use.

Worksheet 2: Solar Energy Production: How does a solar panel work?

Content: Match solar parts with functions (PV panel, inverter, battery, load).



DIY paper model template included.

MODULE 3: Solar Applications at Home & School

Aim: Learn how solar works (PV cells, inverter, storage), sun as energy source

Components: video link, case study from Project Surya Chakra, interview exercise

Informational Video:

https://www.youtube.com/watch?v=gBW7tihwetA&ab_channel=WorldBank

Case Study:

Have you seen solar panels around you? Maybe at school, or in a private residence? The potential of solar power is tremendous and it is being harnessed all around the country!

One such project that uses solar power is Project Surya Chakra.



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Link: <https://projectsuryachakra.com/>

By helping farmers install solar panels for their *atta chakkis*, Project Surya Chakra helps them reduce their overall costs by cutting down the need for fuel.

Can you think of any other benefits that such a project might have? Think in terms of:

- 1) Environmental Impact: _____
- 2) Economic Impact: _____

- 3) Noise Pollution: _____
- 4) Land Pollution: _____
- 5) Social Equality: _____

Worksheet 3: Solar in Daily Life — "Meet a Solar Hero"

Find someone in your life who has used a solar panel before – you might have to ask your teachers and parents for help with this one!

Use this space to draw your solar hero. You can also mention their name, age, and occupation if you'd like!

QUESTIONS TO ASK YOUR SOLAR HERO:

- 1) When did you start using solar energy?
- 2) What do you use the solar panels for?
- 3) How did you first find out about solar power?
- 4) What do you wish people knew about renewable energy?
- 5) What is the set up of your solar energy system?

PLEASE WRITE DOWN ANSWERS HERE:

You can use this space to draw out the solar system and to write a quote by your solar hero!

Module 4: Solar & The Economy

Aim: Understand how solar energy helps save money and create new jobs.

Components: Real life stories, savings worksheet, simple matching

Real Stories of Change:



1. William Kamkwamba – Malawi (Africa)

As a teenager, William built a wind turbine using scrap parts and books from a library. It powered lights and a radio in his house during a drought. Later, he built a solar powered water pump to irrigate crops and help his village grow food again. His story became a movie: The Boy Who Harnessed the Wind.



2. Greta Thunberg – Sweden

Greta started a climate strike at age 15 by skipping school on Fridays to demand action. Her small protest became a global movement: Fridays for Future. She inspired millions of young people to speak up about fossil fuels and switch to clean energy like solar and wind. Greta says:

“You are never too small to make a difference.”



3. Dr. Vandana Shiva – India

Vandana is a scientist and environmental activist. She fights for farmers' rights, clean soil, and clean energy. She promotes solar powered farming and supports rural women using solar for cooking, lighting, and small businesses. She shows how climate justice is linked to equality.