



## **YEARS 2-4**

# Solar Power and Weather

## **OVERVIEW**

Learn about solar energy and how the weather influences solar power.



# NZ CURRICULUM LINKS

LEARNING AREAS:	ACHIEVEMENT OBJECTIVES:	LEVELS:	YEARS:
Science: Planet Earth and Beyond: Astronomical systems	Share ideas about the Sun and Moon and their physical effects on the heat and light available to Earth.	1-2	1-4
Physical world: Physical inquiry and physics concepts	Explore everyday examples of physical phenomena, such as movement, forces, electricity and magnetism. Seek and describe simple patterns in physical phenomena.	1-2	1-4
Science	Nature of Science: Investigating in science	1-2	1-4

# **TEACHER INFORMATION:**

#### Learning sequence



INTRODUCING KNOWLEDGE



EXPLORE AND



CREATE AND SHARE



REFLECT AND EXTEND



MAKE A DIFFERENCE

## Learning intentions

Students are learning to:

- discover what solar power is and how it works using the Sun's energy.
- explore how weather affects solar power.

## **Success criteria**

Students can:

- record their ideas about solar power.
- observe the weather and identify how the weather might influence solar powered devices.

#### **Resources needed**

Computer and internet connection, solar powered devices, appliances or toys, Solar power slideshow, solar power system (optional).

## **Additional Support**

Solar power is energy produced using the Sun's heat and light energy. There are two main types of solar power: photovoltaic (PV) and solar thermal technology (used to heat hot water). This activity is based around solar PV power which is the most common form of solar power currently used for solar powered lights, toys and small solar appliances such as solar calculators, phone chargers and solar STEM kits. You can find examples of these in electronics stores.

How a solar power system works in NZ Video by My Solar Quotes Solar Energy video by Little School Science Learning Hub: Solar power article

## Vocabulary

Sun, weather, solar power, solar panel, cloudy, photovoltaic, sunny, electricity, dashboard.

Any text highlighted in orange represents a link to further material. If you have printed this resource, please return to <u>schoolgen.co.nz/for-teachers/resources</u> to access the linked material.



# LEARNING EXPERIENCE

Note: These are suggestions only and teachers are encouraged to adjust the activity to suit the needs and interests of their students.



# **INTRODUCING KNOWLEDGE**

Allow approximately 15 minutes

## Introducing solar power and weather

- View the School-gen Introducing Solar power slideshow.
- After viewing, discuss solar power and solar panels. Discuss examples of solar power around the school and community.
- If you have solar panels at your school or at a house or place nearby, take a short walk to have a look at them. Students could then record their ideas about solar power.



# **EXPLORE AND INVESTIGATE**

Allow approximately 20 minutes

Take students outside to observe the weather and think about solar power.

- Share ideas about how to describe the weather, giving examples such as sunny, windy, cloudy and stormy. Explain that weather can influence what types of electricity production will work best.
- Do students have any questions about weather and the Sun? Discuss students' questions and explore answers, e.g.: Is the Sun shining brightly today? Are there any clouds in the sky? Can you feel the Sun's heat and light energy today?
- Use the student worksheet: Solar power and weather to record weather observations in the morning and afternoon (see page 4 . For younger students, you could discuss and record findings as a class.
- Take a small solar appliance such as a solar phone charger, solar calculator or solar toy outside. Can you tell if it is working? Does the weather affect how the solar panel works? If a cloud comes over the sun will the solar panel still produce electricity?
- A solar light works differently: it will light up if you put your hand over the solar panel. Why is this? (It has a battery to store the charge which is triggered to power the light when there is no light source. Solar light PVs make and store power during the day and then use it at night).
- Compare the weather observations to the solar appliance/toy observations. Discuss any patterns you can see. For example, during clear, sunny periods solar energy production should be higher.





Head outside and record the weather and if your solar appliance is working in that weather in the table below.

Student worksheet: Solar Power and Weather					
	Time	Describe the weather Is it sunny, rainy, windy or stormy?	Solar appliance or toy observations e.g. tick if it worked, cross if not.		
MORNING WEATHER	Time: (circle the weather you observed) $\overrightarrow{-}$				
	Time: (circle the weather you observed) $\overrightarrow{-}$				
TEMPERATURE	Outside temperature (circle temperature for morning)	Hot Warm			
		Cool			
		Cold			
AFTERNOON WEATHER	<b>Time:</b> (circle the weather you observed) $-\frac{1}{2} \bigvee_{1}^{1} (-\frac{1}{2} - \frac{1}{2}) = 0$				
TEMPERATURE	Outside temperature	Hot			
	(Circle temperature for alternoon)	Warm			
		Cool			
OTHER NOTES					

Google doc link









• Make a solar oven to further explore solar energy. See link for a guide and video of how to make one.



## **REFLECT AND EXTEND**

Allow approximately 10-20 minutes

- What do you know now about solar power and the weather?
- How can solar power be affected by sunny or cloudy days?
- If possible, visit a PV solar system and observe its control panel or meter to see how much electricity it produces. Is this dependent on the weather?



# MAKE A DIFFERENCE

Allow approximately 15 minutes

- Solar powered appliances, chargers, lights, lanterns, and other gadgets are becoming more popular all the time. What solar powered gadgets and electronics can you spot in your neighbourhood? Share examples.
- Solar power saves energy and reduces battery use, pollution and carbon emissions. How can your school or family make a change to a solar powered or renewable option which would save money and the planet? For example, switching to a solar charger for a device or phone can reduce your carbon emissions and increase the life of your batteries!

We hope you have enjoyed this educational STEM resource.

School-gen is a Genesis community initiative to get kaiako, tamariki and whānau enthused about STEM.

For more free resources please visit our Genesis School-gen website and follow us on Facebook and Instagram @schoolgennz



