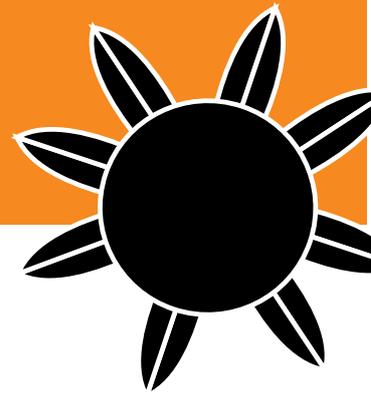


Solar Power at Home!

Information



- Have you ever wondered whether your house could be powered by solar panels? The following project will educate and enthuse children from Key Stage 2 whilst exploring the local environment and learning more about sustainable energy. It is suitable for years 3 – 6, although the younger children will need some adult support.
- This project will give your child the opportunity to investigate whether your household or neighbourhood would benefit from solar panels. Don't worry, you will not need to put in the panels but the children will use many skills in this realistic investigation!

Safety

Never Look directly at the sun.

Harmful light from the sun can cause permanent damage to your eyes, even when wearing sunglasses. All sunlight measurements will be carried out with your back to the sun, to maximise safety and minimise risk.

Equipment

Pencils

Rubbers

Rulers.

Local maps

Optional: Computer/iPad with access to Google Earth

Vocabulary

Renewable

Renewable energy is made from resources that nature will replace, like wind, water and sunshine.

Non-renewable

A non-renewable resource is a natural resource that is used up faster than it can be made by nature.

Map

A map is an image or drawing of an area which shows where things are

Bird's Eye View

A view seen from high above, looking down.

Background Information about Solar Power

Here are a couple of useful links for you to explore before you begin:

[Facts about solar power](#)

[BBC Bitesize information on renewable energy](#)

1) Mapping the Local Area

Discuss what a 'bird's eye view is' and from what angle this map will be drawn. You could look at 'Google Earth', so they get the idea of looking from above. Walk around your local area with your child talking about and making a note of what can be seen. It may be helpful to take a clipboard and do a rough sketch when out and about.

Ask them to include any of the following things: roads, streets, bridges, interesting buildings, rivers, lakes, streams, hills, sports fields, gardens or parks. See if you can spot any solar panels when you are out. Before they start to draw have a look at the example map, what do they like or dislike about the way it has been drawn?



An example of a map

2) Where would the Solar Panels go?

- This section will require your child to consider different locations and then choose three to measure the light from. The solar panels are approximately 1.5m long and 1m wide. There are different considerations to talk through listed on the worksheet: for example, is anything obstructing the sun's light from hitting that area? A roof is often the best place for a solar panel, as it has the most exposure to sunlight, so everyone will need to be safe when collecting data about how sunny it is there. Therefore, they either need to see it from a safe place or have safe access to that area.
- Having collected the data, your child may want to use their results to discuss which is the sunniest and therefore best area for a solar panel.

3) Solar panels are good for the environment, but will they end up being more expensive than your normal electricity bill?



This gives some examples of what your child's calculations might look like.

Solar panels for a house cost £121 per month for 3 years, then they belong to you and all the electricity you get from them is free. (source Eon Energy)*

If solar panels cost £121 per month how much will they cost for 1 year?

*£121 multiplied by 12 months =
121 x 12 = £1,452 So the solar panels will cost £1,452 per year.*

How much will the solar panels cost in total over the 3 years?

*£1452 x 3 years = £4,356
Or
£121 x 36 months = £4,356*

Information about electricity bills (source UK Power, averages)**

A 1 or 2 bedroom flat/house = £34 per month

A 3 or 4 bedroom house = £49 per month

How much is your electricity bill for 1 year?

If you have a 3 bedroom house...

£49 x 12 = £588

How much is your electricity bill for 3 years?

£588 x 3 years = £1,764

Or

£49 x 36 = £1,764

How much more is it to have solar panels then pay the electricity bill for the first 3 years?

Cost of solar panels minus electricity bill =

£4,356 - £1,764 = £2,592

So the solar panels cost £2,592 more after 3 years.

To start with the solar panels are more expensive, but after those 3 years people do not have to pay for the solar panels. This means that within 10 years the solar panels are cheaper.

As a super challenge can you work out how many years you need solar panels to make it cheaper than normal electricity bills?

Every year your electricity bill is £588

The total cost of the solar panels is £4,356

So once the total electricity bill is greater than £4,356 the solar panels are a cheaper form of electricity.

Electricity bills: 1 year = £588, 2 years = £588 x 2 = £1,176 8 years = £4,704 which is more than the £4,356 for the solar panels

4) Would it be better to do this with your neighbours so you can share the costs and the electricity? Can you design a poster to persuade people living in your local area that you should all put solar panels in?

The following ideas will help to create a persuasive poster:

- Solar energy does not produce carbon dioxide. It is an environmentally friendly alternative to fossil fuels
- Solar energy is infinite. It is renewable and sustainable
- Once the equipment to collect it has been built, solar energy is free
- Once installed solar panels are low maintenance and just need a quick clean

*Please note these figures are approximations taken from EON Power's website in May 2020 and are used to help children get an idea of installing solar panels. Solar Power Education does not advise on or sell solar panels.

**These figures are averages taken from UK Power website in May 2020. Costs vary widely for each household. If you would like an accurate figure you will need to consult your own energy bills.

National Curriculum Areas Studied

(these are from 4 different year groups but practising them is always helpful)

Geographical Skills and Fieldwork

- use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied
- use fieldwork to observe, measure record and present the human and physical features in the local area using a range of methods, including sketch maps, plans and graphs, and digital technologies

Science

- notice that light is reflected from surfaces
- recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- recognise that shadows are formed when the light from a light source is blocked by an opaque object
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations

People who use these Skills for Work

Beth and Stuart are **scientists** developing innovative new ways to generate electricity from the sun. Did you know they can make solar panels that are 100x thinner than human hair! Since these are so cheap and lightweight, one day they will be generating electricity in the most remote parts of the world, and maybe even for spaceships. You can read more about them on our [website](#).

A **Solar Panel Salesman** will come to your house and identify whether your house could have solar panels and tell you how much they will cost. They use maths in their jobs.

A **Local Counsellor** will look at any plans to install solar panels to see if they are a good decision for their local community. They look at arguments and weigh them up.