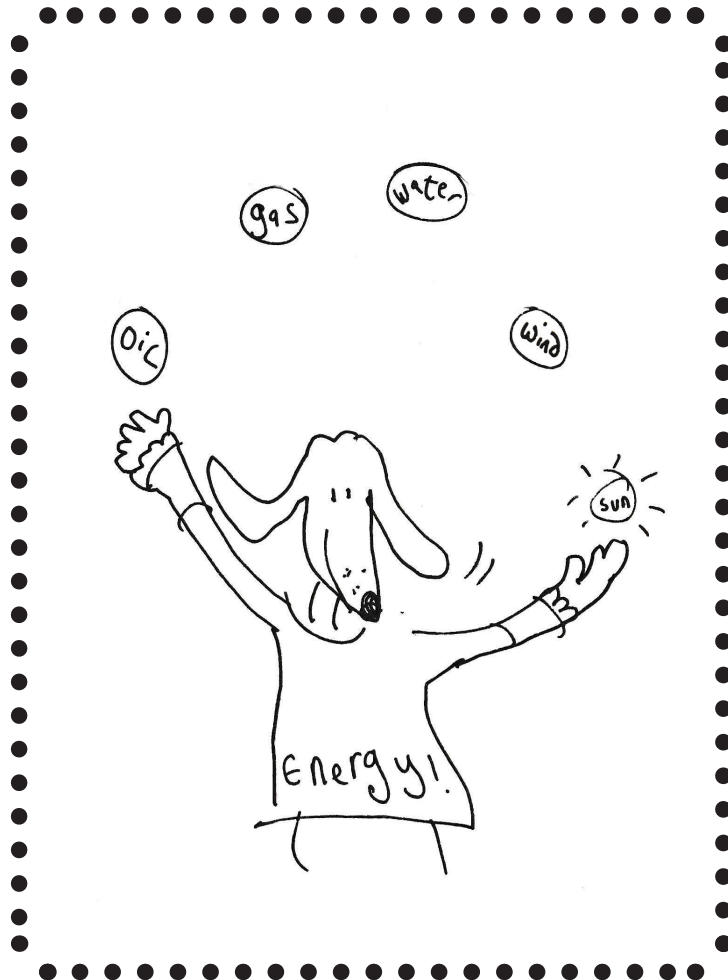


# ENERGY DIARY



Date .....

Name .....

Age .....

Area ( eg SY7 ) .....

## Dear Parent/ Carer

Please could you support your child over a week to fill in this diary? The purpose of this project is to help your child:

1. Explore the many ways that energy is generated.
2. Gain an understanding, through filling in the diary of how energy is used in their home, and to help them consider how they may lower their energy use.
3. Develop an understanding that individual behaviour change can make a great difference on a national and global scale.

Embedded links are for useful further information regarding a topic, they are just a starting point for your child to explore further.

The information and emails provided will be treated confidentially and will not be passed onto any third parties without expressed permission.

The answers to the riddles are at the end.

Thank you for your support.

Best regards The Lightfoot Team

**E-mail:** [info@lightfootenterprises.org](mailto:info@lightfootenterprises.org)

**Website:** <http://www.lightfootenterprises.org>

**lightfoot**

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### Do You Know:

You could reduce your annual fuel bill by over £150 by just doing the following

- Switch off and unplug items that don't need to be left on.
- Turn lights off if not needed.
- Use a bowl for washing up rather than using running water.
- Do one less clothes wash per week.
- Close curtains to keep warm in winter and cool in summer.
- Turn the thermostat down 1°C.
- Only fill the kettle with what is needed.
- Take 1 less minute in the shower.

# WHAT IS ENERGY?

Hello and welcome to your energy diary where you will learn all about different energy sources and how you can observe and save energy in your own home.

You can save this document and complete it on your computer or you can print it out. If you are filling your diary in on your computer use some paper to do the drawing activities. Now let's get started and discover what energy is!

**Look around your home.** For many everyday purposes such as using a computer, heating, lighting and cooking, we need energy which can be produced from lots of sources. Some energy can be replaced (**renewable**) and some cannot (**non-renewable**).

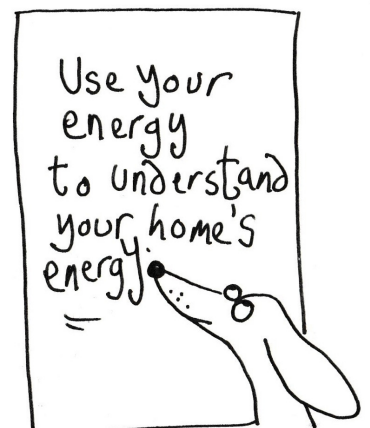
Explore  
Collect evidence  
fill in the diary



## ENERGY SOURCES

**Fossil Fuels (Oil, Gas, and Coal):** These are formed from plants and animals that lived between 300 million and 60 million years ago. They have to be extracted from the ground and once burned are gone for good, so they are non-renewable sources. Burning fossil fuels releases carbon dioxide (CO<sub>2</sub>), methane and other greenhouse gases into the atmosphere. To find out more about the greenhouse effect see: <https://kids.britannica.com/kids/article/greenhouse-effect/403919>

**Nuclear:** radioactive materials extracted from the ground, such as Uranium, are used to generate electricity in a nuclear reactor but this also produces radioactive waste that must be stored very carefully because it remains dangerous for thousands of years. However, the energy is produced without releasing CO<sub>2</sub> into the atmosphere. Nuclear fuel is non-renewable.





**Water, Wind, and Solar** are energy renewable sources that use the power of the sun, either directly as heat, or by being converted into electricity. As long as the sun shines, the wind blows and the water moves, they can provide us with energy.

**Trees and Plants** Trees and plants use the sun's energy to grow, and we can use them as an energy source (Biomass fuels) by burning them. They also use  $\text{CO}_2$  to grow and when they are burnt this  $\text{CO}_2$  goes back to the air. Sometimes plants (and other things like cattle poo) rot and the gas (methane) is produced, often called Biogas. <https://kids.kiddle.co/Biogas> The methane is used as a fuel for heating homes, generating electricity or even powering buses.

**Geothermal** energy comes from the Earth itself. As you drill down into the rocks, they become hotter, sometimes even molten. In Iceland, water coming into contact with hot rocks turns to steam and is used to heat houses. In Bath, this energy is being used to heat the huge cathedral buildings.

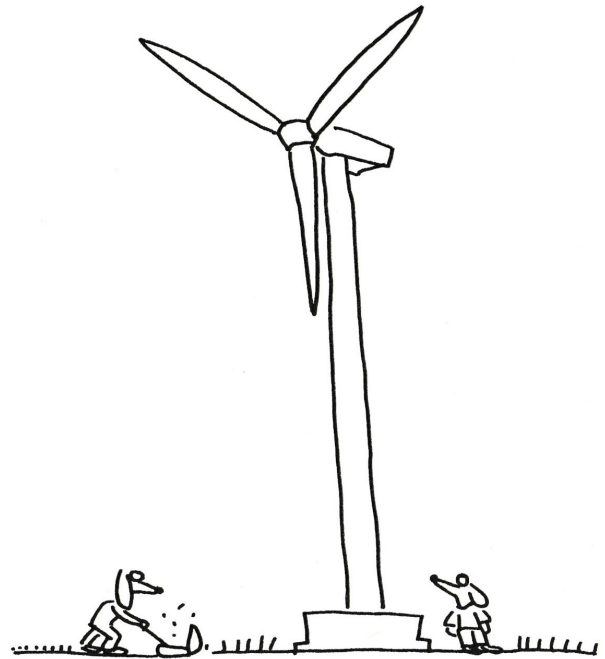
**Heat pumps** act like reverse fridges. The pumps extract heat from the air or the ground and use it to warm the house. Electricity powers the system, but if this is produced from 100% renewable sources, a house can have hot water and central heating without needing to burn any fuel.



Find out more here! <https://www.funkidslive.com/learn/>

# CLIMATE CHANGE

The increase of CO<sub>2</sub> in the atmosphere is changing our climate and scientists say we must reduce the amount of CO<sub>2</sub> by replacing fossil fuels with other energy sources and taking out some of the CO<sub>2</sub> by planting trees. **Which of the sources you have looked at are renewable? Can you think of any other renewable sources to add to your list?** (clue: people power)  
We want loads of ideas, be as zany and creative as you like, write or draw your ideas below or on an extra piece of paper.



Some homes are good at making and keeping energy, some are leaky and need ways to keep the energy in.

**Match the beginnings of the sentence to the sentence endings:**

- |                                  |                                   |
|----------------------------------|-----------------------------------|
| 1. Solar energy                  | are double glazed                 |
| 2. Turn the light off            | to stop draughts from under doors |
| 3. Most energy efficient windows | is renewable energy               |
| 4. Use a draught excluder        | when you leave the room           |

# METER WATCH

Please ask an adult to help you take a meter reading at the same time each day and work out how many units of electricity (kWh) are used in a day. For more information about which items need the most energy see: <https://www.ovoenergy.com/guides/energy-guides/what-is-a-kwh-kw-and-kwh-explained.html>

To help you with the next section have a look at this website:

<https://www.funkidslive.com/learn/smart-meters/what-is-a-gas-and-electricity-meter-where-is-my-gas-or-electricity-meter/>

Meter Reading	Minus	Meter Reading	Equals	Units of electricity used per day (kWh)
Day 2	-	Day 1	=	
Day 3	-	Day 2	=	
Day 4	-	Day 3	=	
Day 5	-	Day 4	=	
Day 6	-	Day 5	=	
Day 7	-	Day 6	=	
<b>Total</b>	-	<b>Total</b>	=	

A **Smart Meter** is provided by your energy supplier.

It measures energy, as you use it in the home, both in kWh and cost.

Do you have a Smart Meter?

YES                  NO

If yes, do you use it to see how you can save money on bills?

YES                  NO

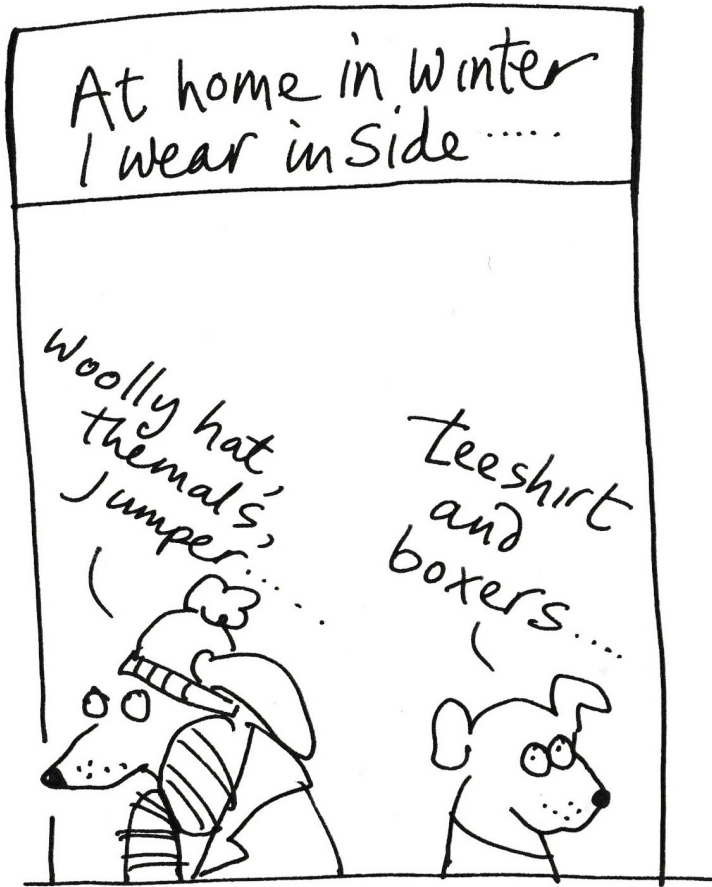
# ENERGY WATCH

Please tick each day when these items are used.

Item	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Computer							
Printer							
TV							
Satellite/BT/Sky box							
DVD/Blu-Ray player							
Alexa/Google/ smart device							
Games Console							
Kettle							
Toaster							
Cooker hob							
Oven							
Microwave							
Dishwasher							
Washing machine							
Tumble drier							
Iron							
Immersion heater							
Fridge							
Freezer							
Hair dryer							
Lights							
Chargers							
Phone							
Anything else to add?							

# DAY 1

You can colour me in!



Please **describe or draw** the clothes that you and your family usually wear indoors in winter.

**WORD SEARCH:** Find the following words.

ENERGY	R	C	H	R	G	P
REDUCE	E	A	A	A	A	M
FUEL	C	R	E	L	L	U
CARBON	U	B	P	O	O	P
SOLAR	D	O	L	S	U	F
PUMP	E	N	E	R	G	Y
	R	F	L	E	U	F

## Did you know:

Wearing slippers in the house makes a big difference to how cold you feel?

**Warm toes = warm body.**





**Draw** a picture of the outside of your home that shows what it is made of (e.g. brick, wood etc) and what sort of house it is (e.g. bungalow) and say how many bedrooms there are.

A large rectangular area enclosed by a dotted line, intended for drawing a picture of a home.

## Riddle:

Why did the foolish gardener plant a light bulb?  
(Answer on page 22)

## Fact:

Fuel consumption in vehicles is lowered by driving more smoothly, and slowly; make sure your tyre pressure is correct and only using air conditioning when you have to.



# DAY 2

**Describe** where the thermostat for the central heating is fitted in your house. What temperature is it set at?  
(Please ask an adult to help. Do not touch the thermostat.)

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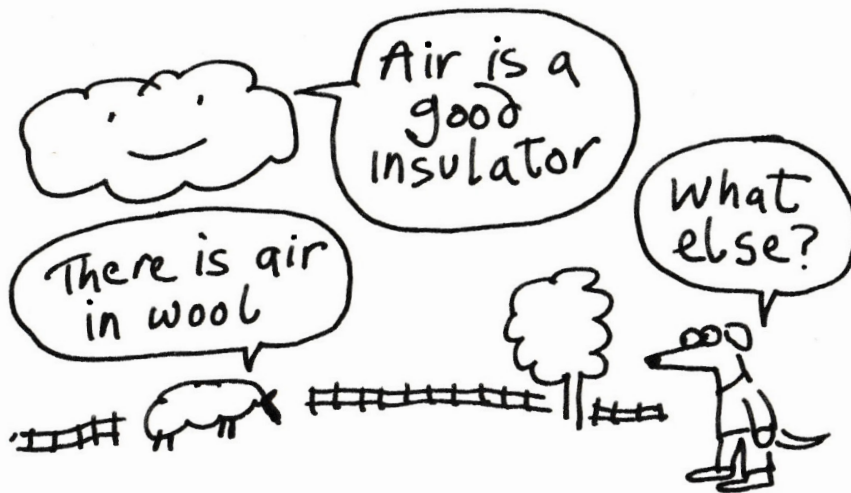
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We're going on a thermostat hunt!



**Insulation** is a material that helps to keep something warm, or cold. Air is a good insulator so something like wool that traps air is excellent. Imagine going outside without a coat on in winter.  
<https://www.funkidslive.com/learn/curious-kate/curious-facts-insulation/>

**Some other great ideas for insulation are....**

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**Draw** small pictures of the patterns you see on the outside walls and roof of your home.

**Label** your picture to show the materials used.

**Find out** For example if they have insulation in, behind or under them. For example wool, fibre glass, shredded paper and so on.

You can use an extra sheet of paper if you need to.

## Riddle:

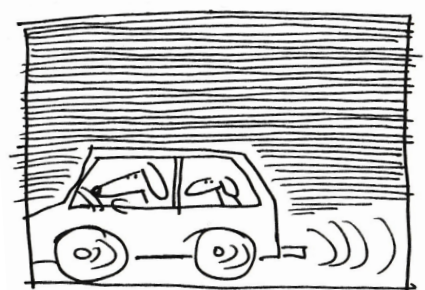
What is burned by cars driven at night? (answer on page 22)

## Energy saving tip:

Close your curtains when it gets dark. This gives extra insulation around the windows

## Fact:

Recycling one aluminium can saves enough energy to run a television set for 3 hours.



# DAY 3

How long do you spend in the shower excluding how long you take to dry yourself? (Do not take any clocks or watches into the shower.) 3 minutes is the recommended time to spend in a shower.



Or if you have a bath measure how deep the water is? Remember heating water takes a lot of energy.





Draw a picture of the types of windows in your home. You can use a ruler. Label how many layers of glass they have and what the frames are made of. **(Windows with 2 layers of glass are said to be double glazed, find out what windows with 3 layers of glass are called.)**

You can use an extra sheet of paper if you need to.

Large empty rectangular area with a dotted border for drawing windows.

Windows with 3 layers of glass are called .....

### Riddle:

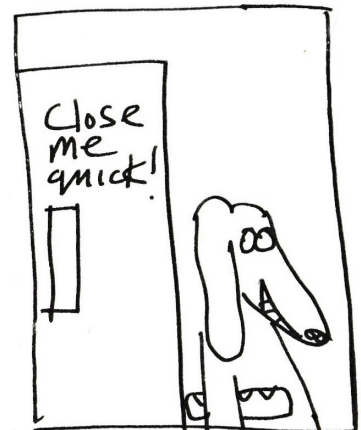
How are renewable power plants like people who enjoy going to the beach? (answer on page 22)

### Energy saving tip:

Remember to close doors after you, it keeps the room warm in winter and cool in summer.

### Fact:

Light from the sun takes 8.3 minutes to reach the Earth.



# DAY 4

Are there any places in your house where it is always colder even when the heating is on?  
List where these are and try to work out why that is.

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Draw a picture of the main things that make heat to keep your home warm.  
What type of fuel is used? You can use an extra sheet of paper if you need to.

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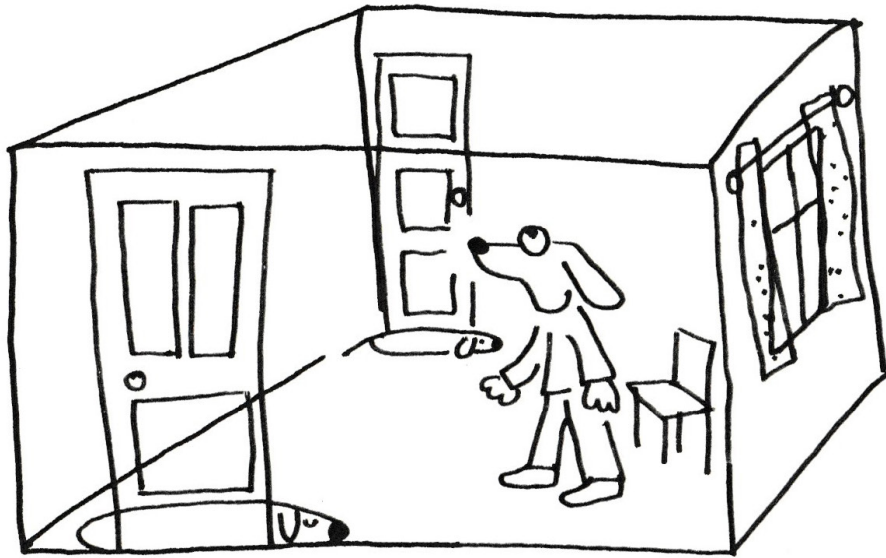
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Some homes have rooms heated separately or not at all. Some have central heating where each room has radiators or underfloor heating. Investigate how the rooms below are heated in your home. Some may have more than one way that they are heated.

Tick the type of heating for each room below.

Room heated by	Living Room	Kitchen	Bedroom	Bathroom
Underfloor				
Radiators				
Night Storage				
Electric heater				
Open fire				
Wood stove				
No Heating				
Other				

## Energy saving tip:

Don't leave the fridge door open while you are deciding what to eat.

## Fact:

A small family who live in a three-bedroom house and are in full-time work and education might use 3,200 kWh of electricity a year.

# DAY 5

Do you use any items inside or outside your home that are either on timers or use a sensor (these can be motion or light sensors)? **Please list the items below and tick whether they are timed, or on a sensor.**

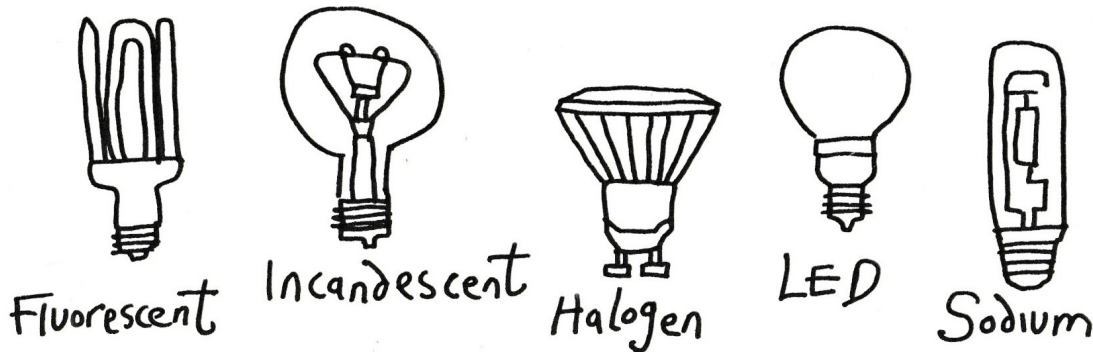


Item	Timed	Sensor

## Light bulbs.

There are many different types of light bulbs and modern ones are more efficient and use less energy to give us the light we need. Watch this video that explains how the light bulb works.

[https://www.youtube.com/watch?v=l1Arc\\_REGEg](https://www.youtube.com/watch?v=l1Arc_REGEg)





Go around your home and count the number of different types of bulbs you find:

Types of lightbulbs most efficient at the top	Number
LEDs (Light Emitting Diodes). Tip: look for the dots through the glass.	
Fluorescent bulbs or tubes. E.g. Small spiral type bulbs are Compact Fluorescent Lights (CFLs) or tube strip lights.	
Halogen. Tip: there is only one bulb	
Incandescent. Tip: look out for the wire filament.	
Sodium (mostly used in sports stadiums and streets, they have an orange glow.) Are your street lights sodium?	

## Riddle:

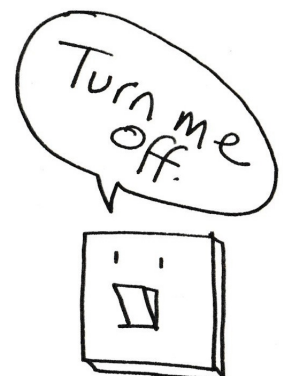
What is a renewable energy source that is used every day at your school? (answer on p22)

## Energy saving tip:

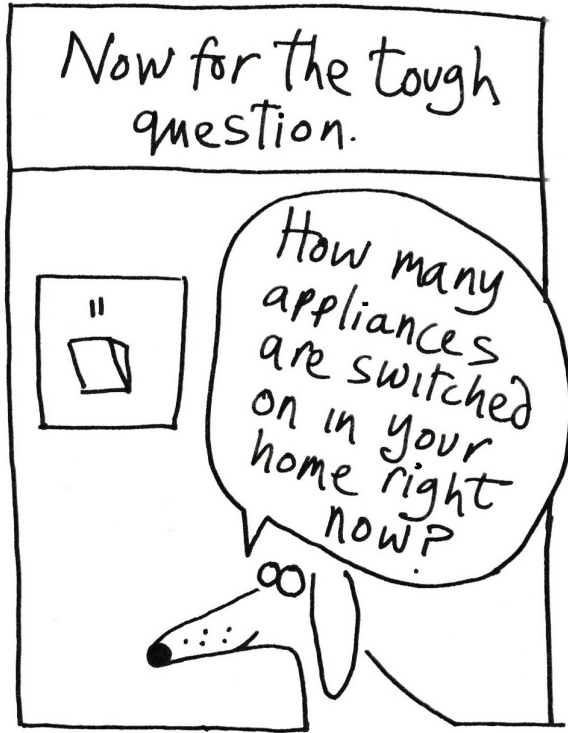
Always switch off lights and the TV when you leave an empty room.

## Fact:

By swapping all the incandescent bulbs in your home for energy-saving alternatives you could save around £30 a year from your energy bills, and 110kg of carbon dioxide." (Energy Saving Trust)



# DAY 6



Count how many things using electricity are switched on or are left on standby in your home.

Write the number here.

Count how many items have been left on unnecessarily and could be switched off. **(Remember that some items in your home have to be switched on all the time e.g. the deep freezer, so please check if you don't normally switch something off)**

Write the number here.

What could be switched off?

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## Energy saving tip:

Switch off your game consoles they use nearly as much energy on standby as they do whilst you are playing on them.

## Fact:

CFLs and LEDs use 75% or less of the energy consumed by an incandescent bulb.

Make a poster for you (and the rest of your family) to pledge what you will do to save energy in your home. (We would love to see pictures of your posters on our website). You could photograph them and send to: **[info@lightfootenterprises.org](mailto:info@lightfootenterprises.org)**

A large rectangular area enclosed by a dotted line, intended for creating a poster. The area is completely blank, providing space for the user to draw or write their energy-saving pledge.

# DAY 7

Can you think of any other ideas that would ideally save energy in your home? Please write a list:

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In your list above give yourself a BIG tick if you wrote “keeping out draughts”. A draught from a window, a door, an unused chimney or even from cracks in walls and floorboards can make you feel cold even when the temperature of the room is high. Hunt them down and stop those draughts. There are plenty of internet sites that show you how you can make your own draught excluder. Happy sewing!

**Design your own draught excluder below.**



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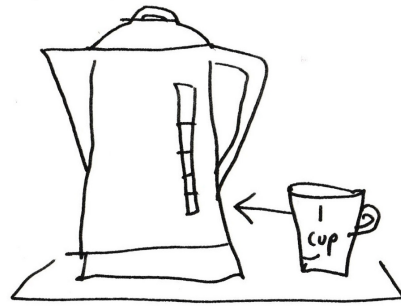
.....

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**NOTE FOR ADULTS - Air bricks/vents help to prevent the build-up of mould as well as carbon monoxide. It can be dangerous to cover them.**

Draw pictures of the things in your home that heat water for you, and your family, to use for washing, cooking, cleaning and so on.



A large rectangular area enclosed by a dotted line, intended for drawing pictures of household items that heat water.

## Energy saving tip:

Stopping draughts means you can set your heating thermostat at a lower temperature.

## Fact:

Houses are banded from A (best) - G (worst). G band households typically pay 3 times as much as A band households for their energy. (BEIS 2017)

# Well done!



Draw a circle around the number that shows what you think about the following questions:

**I think it is important to reduce the amount of energy I use:**

1	2	3	4	5
Not important				Very important

**This diary has helped me to understand about energy use in my home:**

1	2	3	4	5
Not much				Lots

**I've enjoyed doing this diary:**

1	2	3	4	5
Not much				Lots

**I know more about energy now since I've completed this diary:**

1	2	3	4	5
Not much				Lots

**Answers to the riddles:**

Why did the foolish gardener plant a light bulb? **Answer** - He wanted to grow a power plant.

What is burned by cars driven at night? **Answer** - Midnight Oil

How are renewable power plants like people, who enjoy going to the beach?

**Answer** - They all like Sun, Wind and Water.

What is a renewable energy source that is used every day at your school? **Answer** - Brain power!

**Source:** <https://www.eia.gov/kids/>

Lots of information, games and puzzles can be found here.

More things to find out from here

<https://jointhepod.org/students/primary>

# Extra useful tips!

Say goodbye to standby, turn things off at the plug if you can.

Wear more clothes if you're cold instead of turning the heating up.

Hang clothes outside to dry on a sunny day instead of using the tumble dryer.

Measure the amount of water you need in a kettle, so you are not wasting electricity. Or have a thermos flask next to the kettle to keep water hot if not needed immediately.

Wait for hot food to cool down before putting it into the fridge. Otherwise the fridge will use a lot of energy cooling the food.

## Extra resources

There are some great free resources available on the following sites:

<https://www.twinkl.co.uk/search/energy>

<https://www.therenewableenergycentre.co.uk/educational-resources/>

<https://bpes.bp.com/>

<https://www.stem.org.uk/primary-science>

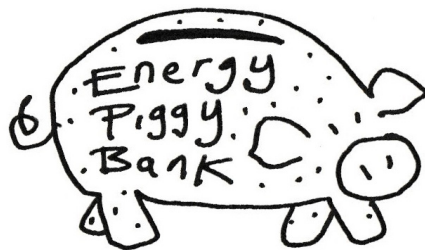
<https://pstt.org.uk/resources>

<https://www.geography.org.uk/Teaching-resources>

<https://www.teachitprimary.co.uk/resources/y4/electricity/physical-processes/>

[sources-of-electrical-power/30423](https://www.teachitprimary.co.uk/resources/y4/electricity/physical-processes/sources-of-electrical-power/30423)

<https://se-ed.co.uk/edu/>



We hope you have enjoyed doing this diary and learning about energy in your home.

We would love to see your diary, **E-mail: [info@lightfootenterprises.org](mailto:info@lightfootenterprises.org)**

Look at the website for tips to save energy, **<http://www.lightfootenterprises.org>**

**Lightfoot- Delivering community-based, experience-driven,  
ecological tools for change.**

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This Energy Diary was originally developed by Amanda Brick, and  
updated by Alison Weeks and Lorraine Waumsley, on behalf of Lightfoot Enterprises Ltd.

Illustrations © Angela Martin. Design Vic Butt

2020