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## Energy story

### Time:

10 minutes

### Who it's for:

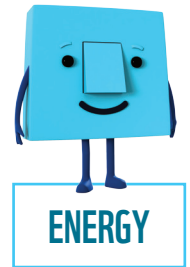
5 to 10 year olds

### You'll need:

- 'A day in the life of...' sheets
- 'A changing climate' sheet

### What to do:

1. Read the story about a young person's Saturday trip to town in the 'A day in the life of...' sheet – there's a girl's and a boy's version, just in case! Ask the group to clap each time they think energy is being used.
2. Break the unit up into seven groups and give each group a paragraph from the story. Ask them to rewrite their bit of the story to show how they could reduce the amount of energy being used.
3. Invite the groups to read their paragraphs in turn so that you create a new, lower energy story. If you think they might need help, you could share some of the ideas from the 'A changing climate' sheet beforehand.



# A day in the life of... a girl's story

Jess is eight years old. She lives in Guildford. Here's a story about a day in Jess's life.

1. Jess is woken up by her mum. She's excited because today Mum is going to take her shopping with a friend. They travel in a big car although the shops aren't very far away.

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2. Jess is keen to buy some new clothes. Many of the ones she likes most were made in India so had to be transported a great distance to reach the shops in her local town.

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3. They stop for lunch and Jess has a quarter pounder: the ingredients come from countries far away (beef from South America; wheat in the bun from North America).

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4. On the way home they stop off at the supermarket and they buy lots of food. As Mum wants to make sure they all get their 'five a day' fruit and vegetable portions, there are apples from New Zealand and bananas from the Caribbean.

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5. When they get back home, Jess and her friend play with her toys for a while. There are lots of them – many of them made in China.

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6. Afterwards Jess has tea. As it's been a long day and everyone is tired, they opt for a ready meal heated in the microwave. The food is wrapped in lots of packaging.

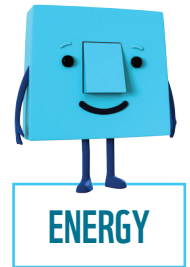
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7. Exhausted, Jess finally goes up to her room and watches TV for a while – the adverts show lots of lovely new toys she'd like to buy! She dreams of them as she falls asleep.

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# A day in the life of... a boy's story

Joshua is eight years old. He lives in Guildford. Here's a story about a day in his life.

1. Josh is woken up by his dad. He's excited because today they're going to the retail park with a friend. They travel in a big car although the shops aren't very far away.

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2. Josh is keen to buy a new computer game console. Many of the ones he likes most were made in China so had to be transported a great distance to reach his local town.

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3. They stop for lunch and Josh has a quarter pounder: the ingredients come from countries far away (beef from South America; wheat in the bun from North America).

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4. On the way home they stop off at the garage and buy lots of treats. The sweets, crisps and fizzy drinks are wrapped in lots of plastic and are hard to recognise from their original raw ingredients.

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5. When they get back home, Josh and his friend play with the new games console for a while. There's lots of different electrical equipment in Josh's room.

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6. Afterwards Josh has tea. As it's been a long day and everyone is tired, they opt for a ready meal heated in the microwave. The food is wrapped in lots of packaging.

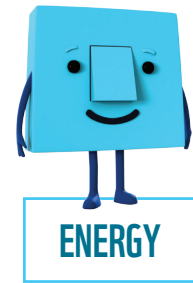
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7. Exhausted, Josh finally goes up to his room and watches TV for a while – the adverts show lots of new computer games he'd like to buy! He dreams of them as he falls asleep.

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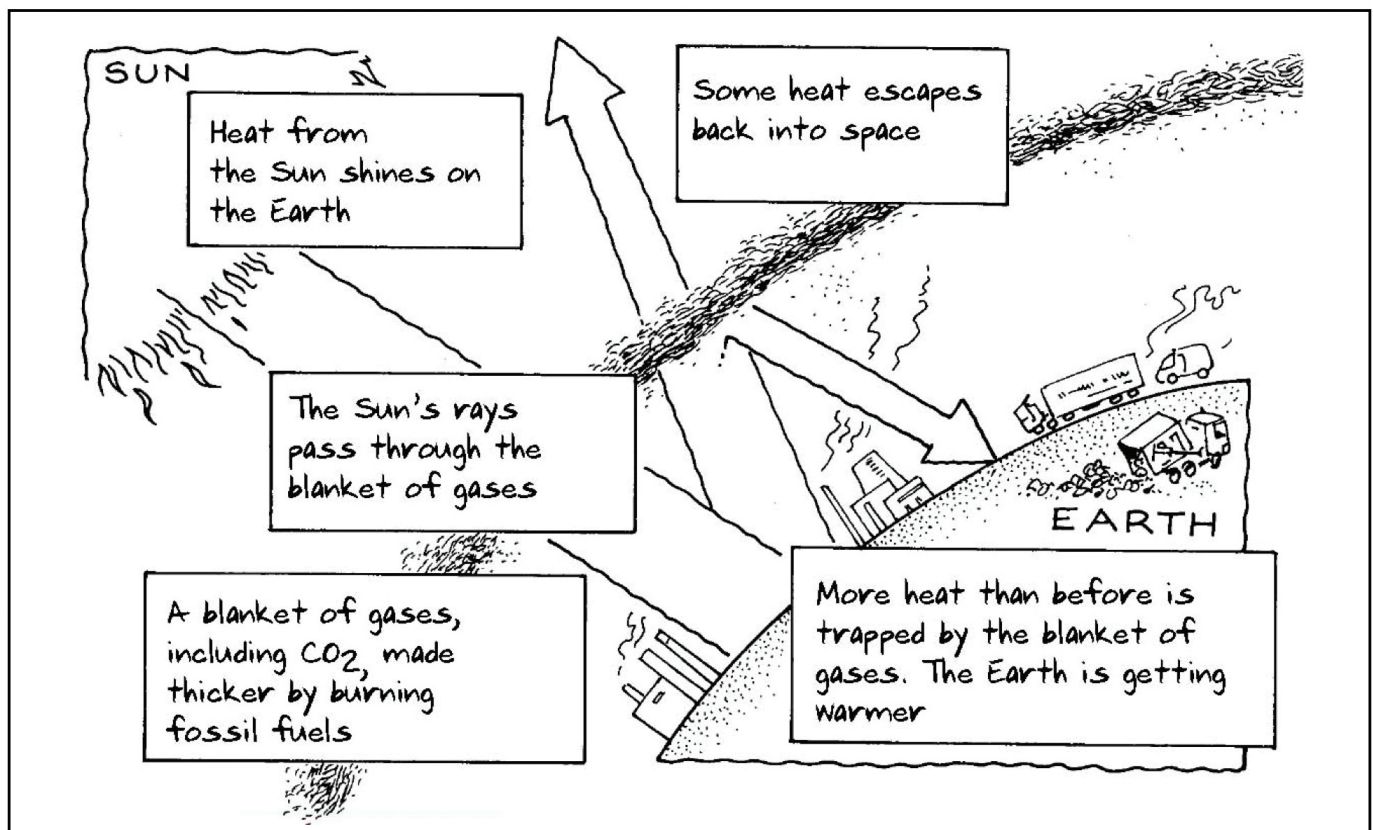
## A changing climate

Our climate has changed many times over the history of the earth – think of the ice age and the dinosaurs! But most scientists and governments agree that human activities are making the climate change so fast, that nature can't keep up – habitats and species just can't adapt in time to survive. And people are affected too – through increased risk of extreme weather events, flooding, etc which affect livelihoods, property, food production and sometimes take lives.

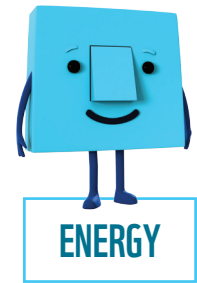
### What's happening?

The earth is surrounded by a blanket of gases. This blanket is important because it lets just enough heat from the sun through to the earth – and just enough heat to escape back into space – to allow life on earth to flourish. But now this blanket of gases is building up too quickly and too thickly – so more heat than before is trapped on the earth's surface, upsetting the delicate balance. Some people call this global warming or the greenhouse effect. A more accurate description is climate change, as the effects can be variable, with some places getting hotter and drier, and others colder and wetter.

### The GreenHouse Effect







## A changing climate (continued)

### What's this got to do with us?

The houses we live in; the factories which make and the shops which sell the products we use; the cars, lorries, planes, boats and trains which transport goods around the world and which we use to get around in, and a host of other things we humans are responsible for – all use fossil fuels like petrol, diesel, gas or electricity and all help to release greenhouse gases such as carbon dioxide into the atmosphere.

### How can we use less energy?

Here are some things for the unit to think about

**How do we travel to our meetings** – is there a better way?

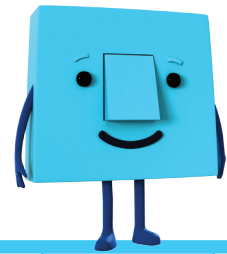
**Stop using so much gas and electricity** in our homes and meeting place. How could we do this? Switch off lights, turn down heating, don't leave electrical goods on standby, close the curtains, wear an extra jumper.

**Use electricity made from the sun, or wind** – this type of energy does not create large amounts of greenhouse gases.

**Don't waste water;** electricity made from fossil fuels is used to pump water to your tap – using water means using energy.

**Buy things that are grown or made close to where you live** – less fuel is used to bring these things to you.

**Reduce, reuse and recycle** – lots of greenhouse gases come from the farms, mines, factories, and transport that make and carry the things we buy. Buying fewer things, looking after the things we have, finding new uses for some of the things we no longer need and recycling other things we no longer need all help to reduce greenhouse gas emissions. It takes less energy to make things like glass bottles, paper and aluminium cans from old cans, paper and bottles than it does when you make them from new. Saving energy helps to save the planet for polar bears and people.



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## Match the energy wasters

### Time:

10 minutes

### Who it's for:

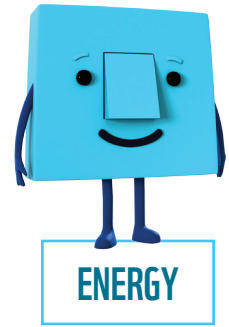
5 to 10 year olds

### You'll need:

- Paper and pens for each pair
- 'Energy wasters list'

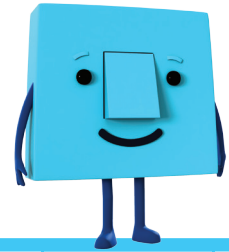
### What to do:

1. Split the group into pairs and give each pair two sheets of paper and a marker pen. Assign each pair one of the ways energy is wasted at home from the list and ask them to draw an image to represent it. They should then reproduce their image on the second sheet so they have two identical images.
2. Collect the cards and lay them face down in a random pattern on the ground.
3. The group should attempt to turn over the two matching cards from each set.
4. They select two cards to be turned over; if they are the same then they stay face up, if not then they are turned over again and the next member of the group can choose two cards to turn over.
5. Continue until all the pairs have been matched, and then turn them back over; how many can the group remember?



## Energy wasters list

<p>Leaving the television on standby</p>	<p>Leaving a charger plugged in whilst it is not in use</p>
<p>Leaving lights switched on when you have left the room</p>	<p>Having the heating up too high</p>
<p>Using a tumble dryer instead of a clothes line when it is sunny</p>	<p>Not using a lid when boiling water</p>
<p>Boiling more water than you need in a kettle</p>	<p>Leaving a tap dripping</p>



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## Spot the energy error

### Time:

10 minutes

### Who it's for:

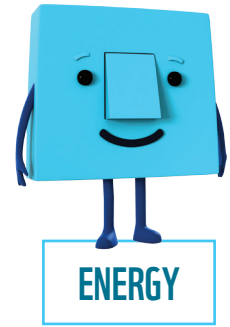
5 to 10 year olds

### You'll need:

'Energy errors' sheet (1 per member)

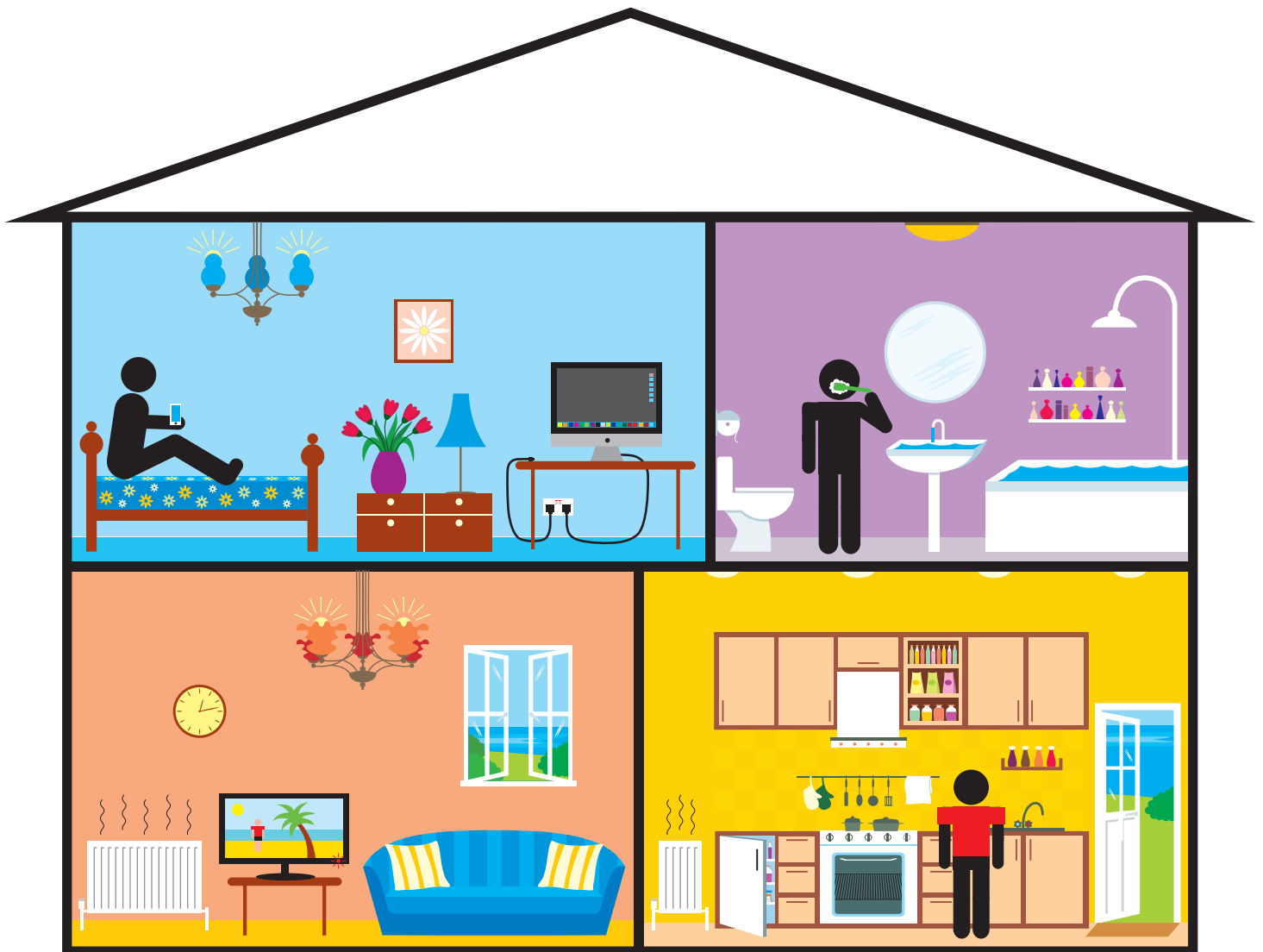
### What to do:

1. Hand out a copy of the 'Energy errors' sheet to each member (this could be completed in pairs with younger groups).
2. The sheet shows a household scene with energy being wasted in a number of different ways. Ask members to identify as many instances of wasted energy as they can and circle them.
3. Run through the sheet as a group and see which team has spotted the most correct answers.
4. Ask each member to come up with another way in which energy can be wasted and share it with the group.



# Energy error sheet

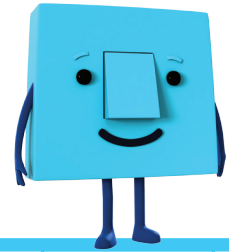
Look at the picture below and see if you can spot any places where energy is being wasted. Circle any you find.



Can you think of any other ways in which energy can be wasted in our homes?  
How could we avoid wasting this energy?

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## Watt is right?

### Time:

10 minutes

### Who it's for:

5 to 10 year olds

### You'll need:

- 'Appliance flashcards' for each group
- 'Appliance flashcards - answers'

### What to do:

1. Split the group into teams and hand out a set of the 'Appliance flashcards' to each group.
2. Ask each team to line up the appliances in order of how much energy they use per hour, starting with the appliance that uses the most and finishing with the least.
3. Once they have finished arranging the appliances reveal the answer. Which team was closest to the right answer?
4. Discuss how they could save more energy using this information.



# Appliance flashcards



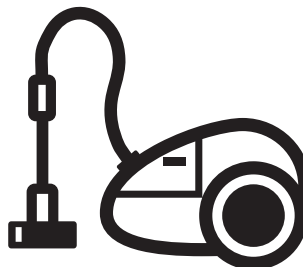
Tumble dryer



Hairdryer



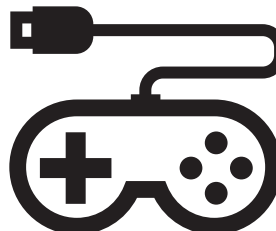
Toaster



Vacuum cleaner



LCD TV



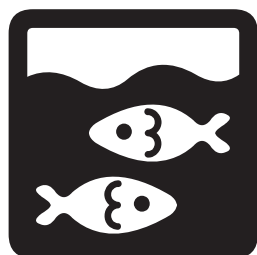
Video game console



Stereo



Laptop



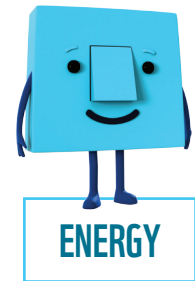
Aquarium



Cordless telephone







## Appliance flashcards – answers



Tumble dryer

3,400 watts per hour



Hairdryer

1,538 watts per hour



Toaster

1,100 watts per hour



Vacuum cleaner

650 watts per hour



LCD TV

213 watts per hour



Video game console

195 watts per hour



Stereo

60 watts per hour



Laptop

50 watts per hour



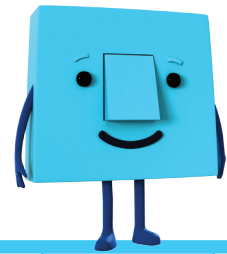
Aquarium

30 watts per hour



Cordless telephone

3 watts per hour



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# Centre of the universe discussion

## Time:

10 minutes

## Who it's for:

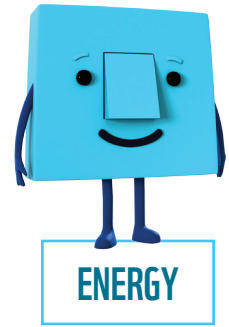
10+

## You'll need:

- 2 ropes - 1 longer than the other
- 'Centre of the universe' cards

## What to do:

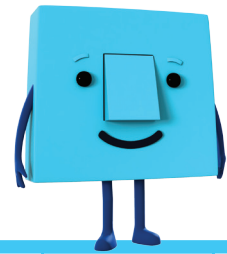
1. Create a large circle on the floor using the longer rope. Use the shorter rope to create a smaller circle (around  $\frac{1}{2}$  a metre in diameter) inside this large circle. This is the centre of the universe.
2. All members of the group should sit around the outside of the larger circle. Hand out the 'Centre of the universe' cards to members of the group.
3. Ask one of the members to stand at the centre of the universe and read out the statement on their card (e.g. drilling for oil should be stopped).
4. Members should choose a position to demonstrate how much they agree – those who totally disagree should remain seated on the edge of the circle, those who totally agree move to the centre of the universe with the person who read the statement.
5. Give members a chance to say why they agree / disagree.
6. Continue until all the cards have been read out.



## Centre of the universe cards

Cut out the cards below and hand them out to eight members of the group before starting the 'Centre of the universe' activity.

<p>Drilling for oil should be made illegal.</p>	<p>We should build more wind farms.</p>
<p>People should try not to waste electricity where possible.</p>	<p>The government should remove all taxes on air travel.</p>
<p>The most important thing is that we keep our lifestyle the same.</p>	<p>It's a good idea to try and find gas in the UK even if it might have negative consequences for the environment.</p>
<p>I am happy to make changes to my life to help protect the environment.</p>	<p>It would be better if everyone cycled to school rather than being driven.</p>



# Energy footprint quiz

Linked activity: 'Energy pledge' activity

## Time:

15 minutes

## Who it's for:

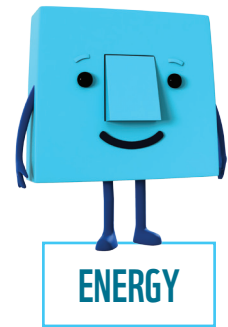
10+

## You'll need:

- Copies of the 'What's my energy footprint?' quiz sheet
- Paper footprint shapes
- Coloured pens and pencils

## What to do:

1. We can all help to save energy, but first it is important to know how much energy we are using and where.
2. Ask your members to spend 15 minutes completing the 'What's my energy footprint?' quiz sheet. Encourage them to be honest!
3. Hand out the footprint shapes and pens/pencils and ask them to record their scores on a footprint shape – they could decorate this to remind them what activities they need to change.
4. Discuss the outcomes: was anybody surprised at the amount of energy they used?
5. This activity could be used as a good introduction (and follow-up) to the 'Energy pledge' activity.
6. Group members could be invited to re-take the quiz weeks after they've put their pledges into action, to see if there are any changes in their scores. You could produce another footprint display showing the (hopefully!) positive results.
7. As an alternative or complementary activity, members could complete the WWF footprint calculator - visit [footprint.wwf.org.uk](http://footprint.wwf.org.uk) - at home prior to the meeting (they will need their parents to help) and bring the results in to share, before decorating their footprint shapes.



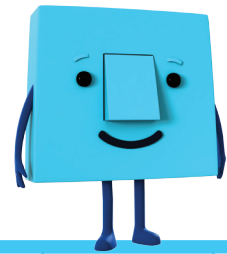
## What's my energy footprint?

Complete this survey and record your score on a footprint. You could complete the survey again after you've made some changes to your lifestyle and see the difference your actions can make to the big issues facing us all.

	All the time 1 Point	Sometimes 3 Points	Never 5 Points
I drink tap water instead of bottled water			
I try to eat a mixture of meat and vegetarian meals throughout the week			
We have low energy light bulbs at home			
I have more showers than baths			
We sort our waste at home and recycle			
We have low energy light bulbs at our meeting place			
I eat locally grown food that doesn't travel by plane to get to the UK			
I turn off my TV, phone charger and computer at the wall instead of leaving it on standby			
I turn the tap off while I clean my teeth			
We use recycled products as much as possible at home			
We sort our waste at our meeting place and recycle			
We don't leave doors and windows open when the heating is on			
We avoid eating ready meals at home			
We wash our clothes at home at 30°C whenever possible			
We use re-usable bags when shopping			
We use recycled products as much as possible at our meeting place			
I only replace my mobile phone when it stops working rather than just to get the most up to date model			
I walk or cycle as much as I can rather than ask for a lift in the car			
I walk or cycle on the way to school or my youth group meeting			
I go by car to school or my youth group meeting even though I could get the bus			
<b>Total score</b>			

### How do your score?

- 20-50** You're a Green King or Queen and a globally aware consumer! Keep up the good work.
- 50-80** You've made a start but have more you can do to reduce your energy footprint.
- 80-110** You've a long way to go, best start now!



# Energy sources sales challenge

Linked activity: 'Wind turbine' activity

## Time:

30-45 minutes

## Who it's for:

All ages

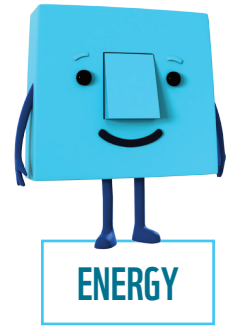
## You'll need:

- 'Energy sources list'
- Copies of the 'Energy sources' cards cut up into individual source cards to hand out
- Copies of the 'Energy sources briefing' for each group
- Paper
- Colour pens and pencils

## What to do:

1. Have the whole group stand in the middle of the room.
2. Designate one wall as 'kinder to the planet' and the other as 'less kind to the planet'.
3. Read out the 'Energy sources list' and ask members to run to the relevant wall to show whether they think the energy source named is kind to the planet, or not.
4. Get the group to cluster into smaller groups and hand out an 'Energy sources card' and a briefing to each group. For younger members you may want to read through and discuss the 'Energy sources cards' together and guide them through the briefing.
5. Their task is to create imaginative adverts to 'sell' their energy source to the public. Younger members could produce posters.
6. After the groups have created their adverts, they could 'present' them to the rest of the group or you could display them.





## Energy sources list



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### Hydro-electricity



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### Solar energy



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### Coal



© Global Warming Images / WWF-Canon

### Wave power



© Global Warming Images / WWF-Canon

### Gas



© Global Warming Images / WWF-Canon

### Wind power



© Michel Gunther / WWF-Canon

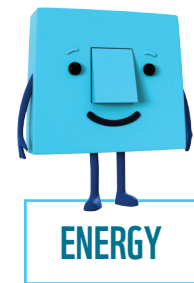
### Nuclear power



© Global Warming Images / WWF-Canon

### Tidal power





## Energy sources cards



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### Hydro-electricity

- Uses the flow of water through dams and reservoirs to generate electricity.
- It's a renewable resource.
- Does not produce CO<sub>2</sub> and therefore does not add to global warming.
- There are a limited number of sites where hydro-electricity stations can be built.



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### Solar energy

- Uses energy from the sun.
- Solar panels generate electricity directly from sunlight: other panels can heat water for heating and washing.
- Does not produce CO<sub>2</sub> and therefore does not add to global warming.
- It can work in cloudy conditions but not at night when it's dark, so energy needs to be stored for day-time use.



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### Coal

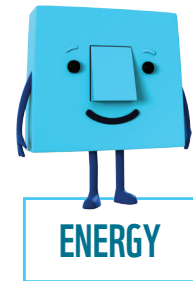
- Coal is a fossil fuel so it's non-renewable.
- Produces CO<sub>2</sub> when it is burned.
- It is used to generate electricity. Very little is used for heating these days.
- Can meet regular and peak demands for electricity.
- A lot of the coal we use is imported.



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### Wave power

- Uses energy from waves to generate electricity so it's a renewable energy.
- Does not produce CO<sub>2</sub> and therefore does not add to global warming.



## Energy sources cards



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### Gas

- Gas is a fossil fuel so it's non-renewable.
- Produces CO<sub>2</sub> when it is burned.
- It is used to heat houses and buildings, for cooking, and to generate electricity.
- We used to produce a lot of our own gas but now have to import from other countries and will need to do this more in the future.



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### Wind power

- Uses energy from the wind, captured by turbines – large blades or propellers that face the wind.
- Does not produce CO<sub>2</sub> from its operation and is a renewable energy source.
- Needs open, windy areas.
- Turbines work when there is enough wind, so if the wind isn't blowing in one place that turbine won't generate electricity.



© Michel Gunther / WWF-Canon

### Nuclear power

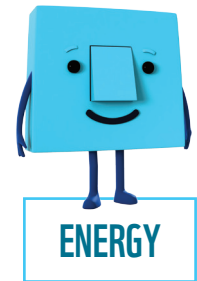
- Nuclear power uses radioactive material to generate electricity.
- It produces a steady supply of electricity.
- Does not produce CO<sub>2</sub> when it is burned so doesn't contribute to global warming.
- When accidents happen they can be catastrophic.
- It produces waste that remains dangerous for thousands of years.



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### Tidal power

- Uses energy from the tides to generate electricity so it's a renewable energy.
- Does not produce CO<sub>2</sub> and therefore does not add to global warming.
- The tides are known and predictable.



## Energy sources – briefing

You're top-notch advertising executives and you have to produce a one page advert 'selling' your energy source to the readers of a popular household magazine.

You could include the following in your advert:

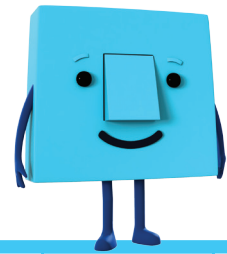
**F Features** – eg where the energy comes from and how it's captured, what it looks, sounds (and smells!) like

**A Advantages** – eg cost, availability both now and longer term, how 'clean' it is (does it cause pollution of any kind)

**B Benefits** – eg the impacts for people and planet now and in the future

### Remember to think about:

- Who your **audience** is – what might interest or concern them?
- What **images** will grab people's attention
- What **headline** will capture your key message



# Melting icebergs game

## Time:

10 minutes

## Who it's for:

All ages

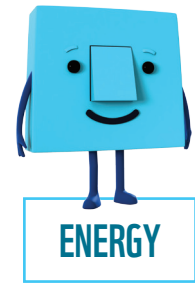
## You'll need:

- Sheets of newspaper
- Copies of the 'Meet the polar bear' sheet

## What to do:

1. Spread the sheets of newspaper out on the floor, making sure there is one piece per member of the group.
2. Explain that the sheets of newspaper are icebergs and that the members are all polar bears.
3. The group should run around the room pretending to swim in the cold water.
4. When the leader calls out:
  - “polar bear's tired” everyone jumps onto the nearest iceberg
  - “polar bear's swimming” everyone starts swimming again
  - “climate's changing” the leader removes one sheet of newspaper.
5. Only one polar bear can stand on an iceberg at a time. Once the icebergs start disappearing, the polar bears left without an iceberg are out of the game. The last polar bear left is the winner.
6. Discuss why the climate is changing (our energy hungry lifestyles use lots of fossil fuels which release carbon dioxide into the atmosphere, trapping heat and causing the temperature to rise – this leads to changes to our climate) and what effect this will have on all animals including polar bears (eg seasonal food availability may change, the places where they live may be negatively affected or destroyed/flooded). You could hand out copies of the 'Meet the polar bear' sheet at this point or use this as your crib sheet.
7. Consider how we can help by saving energy (eg switching off lights, not leaving electrical equipment on standby, changing the way we travel around, turning down the heating at home...).





## Meet the polar bear

© Steve Morello / WWF-Canon



### Description

The polar bear – *Ursus maritimus*, or “sea bear” – is the largest living land carnivore. Adult males measure 2.6 metres in length and weigh 400-600 kg. Females are about half the size. Polar bear cubs are born in snow dens and weigh up to 0.7 kg at birth. The polar bear’s coat, covering it completely except for the nose and foot pads, is superbly adapted to Arctic environments, where temperatures rarely exceed 10 °C (50 °F) in summer and typically hover around -30 °C

(-22 °F) during winter. It is the reflection of light that causes the fur to appear white, or yellowish white. In fact, the fur has no white pigment. Polar bears are excellent swimmers and can sustain a pace of 10 km/h by using their front paws like oars while their hind legs are held flat like a rudder. The soles of their feet have small lumps and grooves that help the bear to walk without slipping. They feed on ringed seals.

### Where they live

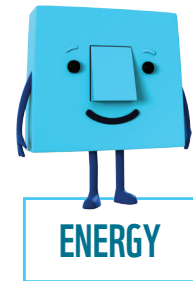
Polar bears live on the ice-covered waters of the Arctic – Canada, Norway, northern USA and Russia. They spend much of their time at or near the edge of the pack ice. This is where they are most likely to find food. As the southern edge of the arctic ice cap melts in summer, some bears will follow the retreating ice north to stay close to seals and other prey. Other bears spend their summers on land, living off body fat stored from successful hunting in the spring and winter. When the ice returns in the fall, the bears leave land to resume life on the sea ice.

### Threats

Increasing levels of carbon dioxide and other heat-trapping gases in the atmosphere from the burning of fossil fuels - oil, coal and gas - are causing global warming (see ‘A changing climate’). As a result, annual sea ice in the Arctic is melting earlier in the spring and forming later in the autumn. Research funded by WWF has found that this leaves many polar bears with less time on the sea ice to hunt for food and build up their fat stores, and increased time on land where they must fast. As their icy habitat disappears, the survival of the polar bear is at risk.

Although the species is not currently endangered, its future is far from certain. If current warming trends continue, scientists believe that polar bears may disappear within 100 years.

Large carnivores are sensitive indicators of ecosystem health. Polar bears are studied to gain an understanding of what is happening throughout the Arctic as a polar bear at risk is often a sign of something wrong somewhere in the arctic marine ecosystem.



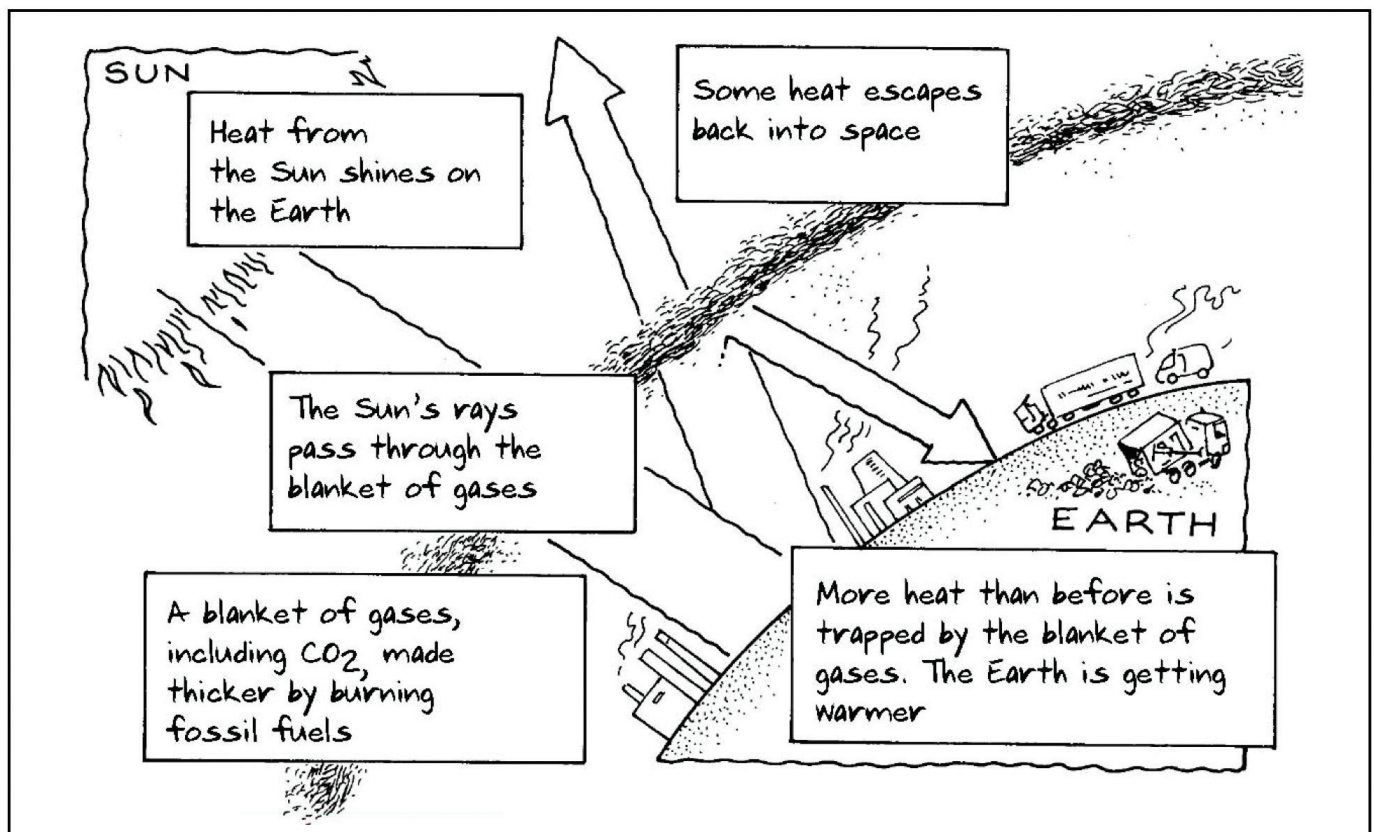
## A changing climate

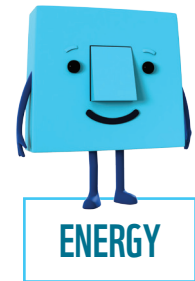
Our climate has changed many times over the history of the earth – think of the ice age and the dinosaurs! But most scientists and governments agree that human activities are making the climate change so fast, that nature can't keep up – habitats and species just can't adapt in time to survive. And people are affected too – through increased risk of extreme weather events, flooding, etc which affect livelihoods, property, food production and sometimes take lives.

### What's happening?

The earth is surrounded by a blanket of gases. This blanket is important because it lets just enough heat from the sun through to the earth – and just enough heat to escape back into space – to allow life on earth to flourish. But now this blanket of gases is building up too quickly and too thickly – so more heat than before is trapped on the earth's surface, upsetting the delicate balance. Some people call this global warming or the greenhouse effect. A more accurate description is climate change, as the effects can be variable, with some places getting hotter and drier, and others colder and wetter.

### The GreenHouse Effect





## A changing climate (continued)

### What's this got to do with us?

The houses we live in; the factories which make and the shops which sell the products we use; the cars, lorries, planes, boats and trains which transport goods around the world and which we use to get around in, and a host of other things we humans are responsible for – all use fossil fuels like petrol, diesel, gas or electricity and all help to release greenhouse gases such as carbon dioxide into the atmosphere.

### How can we use less energy?

Here are some things for the unit to think about

**How do we travel to our meetings** – is there a better way?

**Stop using so much gas and electricity** in our homes and meeting place. How could we do this? Switch off lights, turn down heating, don't leave electrical goods on standby, close the curtains, wear an extra jumper.

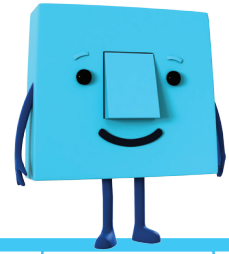
**Use electricity made from the sun, or wind** – this type of energy does not create large amounts of greenhouse gases.

**Don't waste water;** electricity made from fossil fuels is used to pump water to your tap – using water means using energy.

**Buy things that are grown or made close to where you live** – less fuel is used to bring these things to you.

**Reduce, reuse and recycle** – lots of greenhouse gases come from the farms, mines, factories, and transport that make and carry the things we buy. Buying fewer things, looking after the things we have, finding new uses for some of the things we no longer need and recycling other things we no longer need all help to reduce greenhouse gas emissions. It takes less energy to make things like glass bottles, paper and aluminium cans from old cans, paper and bottles than it does when you make them from new. Saving energy helps to save the planet for polar bears and people.





# Model ice cap experiment

## Time:

15 minutes

## Who it's for:

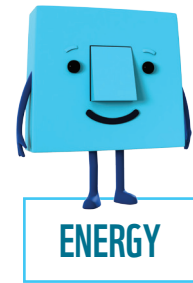
All ages

## You'll need (per group):

- 1 transparent flat-bottomed container
- Flattish stones
- Ice
- Cold water
- Ruler
- Copies of the 'Changing climate' sheet

## What to do:

1. Divide members into smaller groups and give each group a container, stones, ice and cold water.
2. Place the stones in the container and pour in some water (making sure the tops of the stones are not covered). Explain that the stones represent islands in the middle of the sea.
3. Add some ice to the container and explain that this represents an ice cap.
4. Ask each group to measure the depth of the water and mark it on the container.
5. Leave the experiment for the rest of the session.
6. At the end of the session come back to it and observe what has happened. The ice should have melted, raising the level of the water which is now covering more of the islands.
7. Discuss what it would feel like for the people and animals living on those islands.
8. Explain that using fossil fuels contributes to climate change and is leading to the ice caps melting more quickly. Consider how you could use less energy – and therefore fossil fuels, both as a group and individually. The 'Changing climate' sheet will help – you could hand copies round or use as a crib sheet.



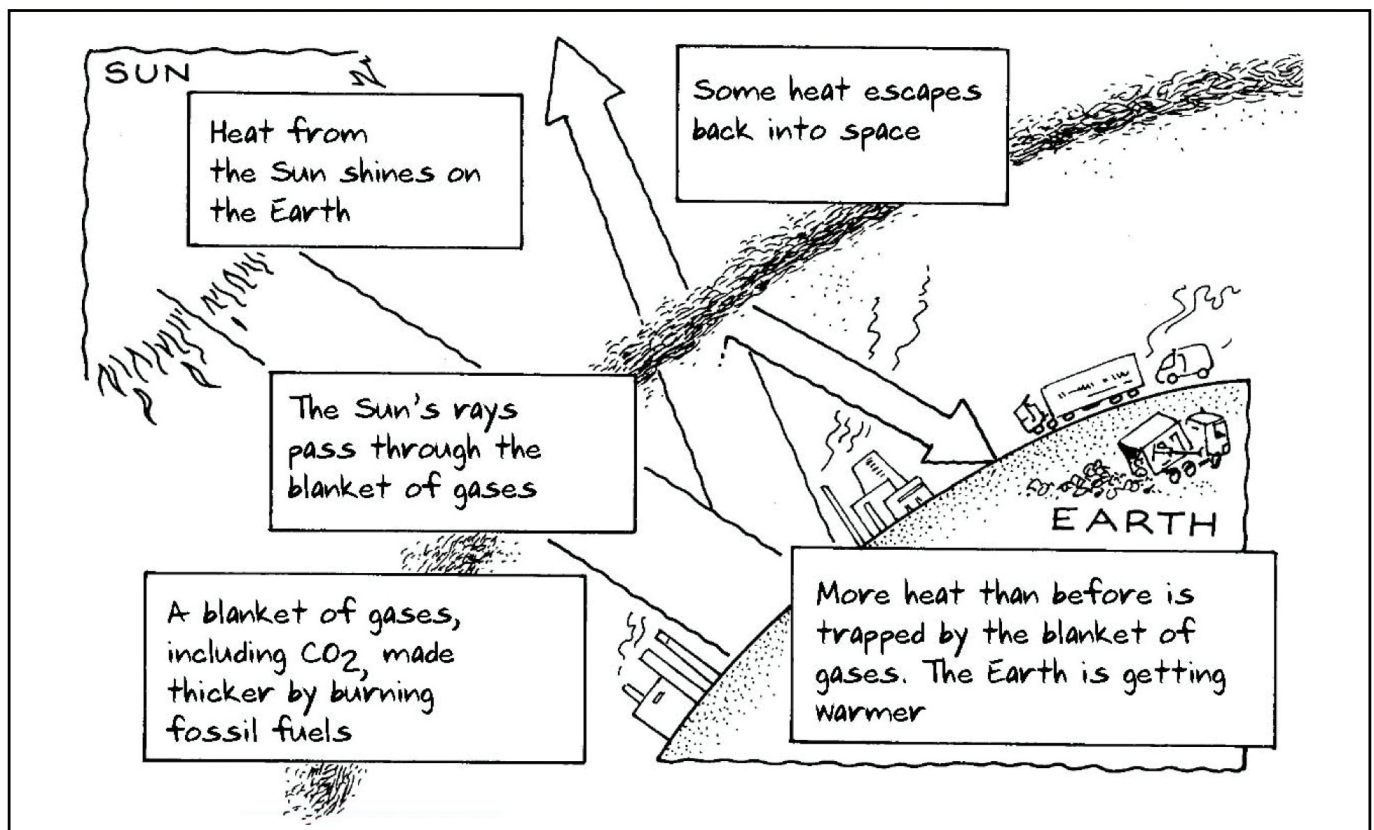
## A changing climate

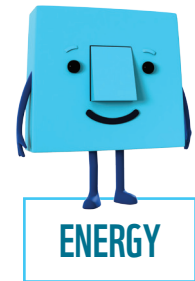
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## A changing climate (continued)

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