

Energy

K, here we go eco-warriors. One of your main tasks is about to be revealed. Stand by. It's not going to be easy. The adults all around you – who pretend to know what they are doing – have made a major boo-boo. Things are going seriously wrong. We never thought that by innocently burning a bit of coal, we would alter the planet forever.

To find out why, let's go back a few centuries to when life was very different. There was never anything very good on the telly – because the telly hadn't been invented yet. If you wanted to go out in the evening, there weren't any cars, buses or trains to take you, so you could only get as far as your legs might carry you. And you'd be walking in the dark, too: no street-lighting in those days. Fancy a meal? Better get the firewood together because microwaves haven't made it into the shops yet. Better make sure you've got enough of that firewood, too, otherwise it'll be getting pretty cold at nights.

Life was indeed very different... so, being the brilliant humans we are, we changed it. We made machines, which burned oil, gas, and coal, all of which we found tucked away in corners of the world where they'd been hiding for thousands of years. Now we can jump in the car, go where we like, heat our houses, make electric light, and all by using fossil fuels dug out of the ground.

But here's the problem. The world is running out of them. And here's the second problem. The more we use them, the more we destroy the world.

Fossil fuels are literally made of fossils - the dead bodies of trees which fell down back in the swampy Carboniferous Period (360 to 286 million years ago) and were weighed down under the dead bodies of more trees and mud. They were squashed and squashed together until over millions of year they became coal. Oil and natural gas are super-squidged layers of marine plankton, tiny creatures which float about in the ocean before landing up on the seafloor. Life - trees and plankton, and you, super-kid - is basically composed of carbon, and when you burn carbon in air, what do you get? Heat, water vapour, and carbon dioxide. With the faithful combustion engine, we can turn that heat into motion and whizz off in our cars. With steam turbines in power stations, we can turn it into electrical power and send it down the power lines to light our houses and heat up our bathwater. The carbon dioxide just kind of hangs around, and that's the problem.

Having some of this carbon dioxide in the atmosphere is a good thing, because it keeps the heat in, like panes of glass in a greenhouse. If it wasn't for gases like carbon dioxide, we'd all be chilling out at -180C. But as we keep burning more and more fossil fuels, these 'greenhouse gases' are building up in the atmosphere. And the result? Global warming. Unfortunately, we're not talking about sunning yourself on your patio in December. Climate change means more weird spooky mad wild weather which is unpredictable and can kill people. Droughts, heatwaves, floods and cyclones, and it's the people in the poorest countries, who have only just started to burn fossil fuels, who are going to suffer the most. It's so unfair!

And there you have it - that's how the combustion of fossil fuels, the most brilliant of all human inventions, could end up destroying our own planet. But fear not, cos that's where you, superkid, come in! These fossil fuels are going to run out eventually anyway, so even if it weren't for global warming, we need alternatives, Super Kid.

And we need them fast.



SUPERFACT
 If no action is taken
 global warming could
 lead to a rise in average
 global temperatures
 of 1.5° – 4.5° Celcius
 by as early as the year
 2030.

Join the energy detectives

Right Sherlock, time to do some detective work on those zombie parents! Get them to take a few moments to sit down and answer some questions on the following website:

<http://www.bestfootforward.com/footprintlife.htm>.

This is the ultimate detective tool, which calculates how eco-friendly their lifestyle is by working out their 'carbon footprint.'

The more carbon they use, the bigger their carbon footprint, so the more they are contributing to climate change.

How big are your parents feet?!

Fill the kettle half full

Making zombie mum a cup of fairtrade tea? Only fill the kettle with as much water as you need! Now if you really want to spoil her, you'll do the washing up too but make sure you put a plug in the sink! Leaving the hot tap running is literally throwing money – and the planet – down the drain!



Get switched on to switching off

You know that little red light on the front of the telly, the one that means you don't have to get up to turn it off? Well, lazy bones – get up and turn it off! Leaving things like TVs, computers and hi-fi equipment on stand-by uses 1% of all the electricity used by the whole of the UK.

Leaving your mobile phone charger switched on at the wall when you are not charging your phone uses up energy, too, as does leaving lights on when no-one is in the room. Just flick that switch on the way out!



Heat just as much water as you need in your kettle – if there's some left over, see if you can use it for something else.

SUPERFACT

A United Nations panel has estimated that we need to reduce global fuel use by 60% immediately in order to stabilise the climate. Current commitments by those governments participating in CO2 reduction will only lower global CO2 by 4 - 6%.

Fridges may look innocent but...

Fridges sit in the corner of the kitchen, humming quietly to themselves, but are they guzzling more energy than they need to keep your food fresh? If you put hot food in the fridge, the poor thing has to work harder to cool it down! This uses up more energy, and if you follow the power lines from the plug in your kitchen to the power station, ends up squirting more carbon dioxide into the atmosphere. The back of the fridge is where all the hard work of cooling down the inside of the fridge is done. If there is fluff on the coils, it will be less efficient – more electricity is needed to cool your food. Keep it clean to keep it green!

Washing the eco-way

Who does the washing in your house? Check that they fill the washing machine as full as possible, use the lowest temperature setting possible, and then hang them out to dry using the amazing power of the sun and the wind. Don't tumble-dry them, and use up more fossil fuels!



Shut up!

Some like it hot, so shut the curtains to stop that precious heat escaping! But if your heating is on when no-one's home or if it's simply too tropical, don't open the window, get someone to change the thermostat.



Who does the washing in your house? Check that they fill the washing machine as full as possible.

SUPERFACT

People often talk about 'White Christmas'. Britain has only seen snow nationwide at Christmas three times in the last century; 1981, 1970 and 1938. This is another result of global warming which is altering our climate.

Do-It-Yourself Home Climate Care

Anyone in your family keen on DIY? Here are a couple of energy-saving jobs for them! If they seem a bit reluctant to get up off the sofa, just remind them that saving energy = saving money = saving the planet. Get to work on the radiators first by putting some shelves up above them and putting reflective foil behind them, so all that valuable heat energy is reflected out into the room. Next, eco-hero, agitate to insulate! Get this DIY expert to fill the gaps where the draughts get in! You could even get them to buy a cute little jacket for the boiler, to keep the water hotter longer using less energy!

Look for the logo

You thought it was only school kids who got grades, but boilers, fridges, everything that uses electricity do too! Have a look at your electrical equipment at home and at school and find the European Energy Label. Appliances with grade A are the best – they cost less to run and save on carbon dioxide emissions. The best of the best of all electrical appliances will have an Energy Efficiency Recommended logo awarded by the Energy Saving Trust -www.saveenergy.co.uk

SUPERFACT

Gaps between windows, doors and floors, which let draughts in and heat out, can account for up to 20% of heat loss in the home.



Check for the Energy Efficiency Recommended logo on all the electrical appliances you use. But don't get too carried away: they're normally in a pretty straightforward place.

Get on the sunny side

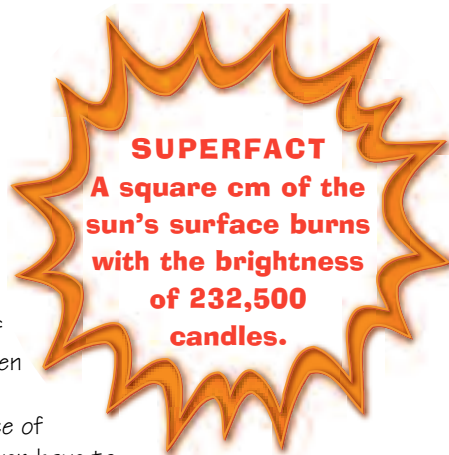
The sun is a huge ball of fire, a mass of energy, of material burning up in outer space, 93 million miles away – so far away, in fact, that it takes 8 minutes for light from the sun to reach us here on Earth. In the centre of the sun, it is 15,000,000°C and it's been burning for the last 4.6 billion years.

Solar energy, then, is the power source of eco-heroes everywhere. And you don't even have to worry about it running out. It just sits in the sky smiling down, offering humans the chance to POWER THE WHOLE WORLD, yet all we can do is dig around in the middle of our planet for more fossil fuels to burn.

Why? Because you can't hold the sun in your hand, or put it into a tin can or a petrol pump, and therefore it's more difficult to sell. People like being able to sell things because they can make money.

Still, now people are realizing that there is this huge ball of fire for free which could heat our water, heat our houses, cook our supper, and we are starting to do something about it. The more people get on the sunny side and use SOLAR power, the better. You can use solar power to recharge your batteries, charge your watch, and even your mobile phone.

Look for cool solar gadgets on www.solarenergyalliance.com and www.selectsolar.co.uk



Get windy

Windy day? All that air rushing about can be put to good use! Like old-fashioned windmills, wind turbines take the power out of the wind and turn it into electricity. So why not try building your own windmill? The perfect material is a K'Nex kit which you can use to piece together the different parts – straws are a great alternative. Visit <http://sln.fi.edu/tfi/units/energy/buildwindmill.html> for more information.



When your windmill is complete try it out against an electric fan and see wind converted to energy before your very eyes!



Once you start making your own windmills, it gets difficult to know when to stop.

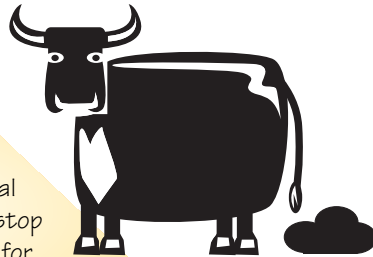
Superfact
If we carry on using oil at the current rate, all the world's oil and most of its natural gas supplies could be used up by the year 2050!

Bio Power

Biomass is the sun's energy stored by life – it is the carbon that is found in every single plant and animal on the planet. Although it still produces carbon dioxide when it is burnt, as new plants and trees grow they absorb carbon dioxide from the atmosphere. It's a cycle.

This means that using biomass for energy, such as by burning wood, doesn't lead to the creation of extra carbon dioxide. It's good news for the climate, as long as new trees replace the old ones.

So don't forget - if you burn wood, plant a tree!



Burn poo!

Another way to get the energy out of biomass means looking in some very smelly places! Burning the gas from animal poo, such as cowpats, is a clever way to stop methane (a gas which is 21 times as bad for the climate as carbon dioxide!) getting into the atmosphere, and make energy at the same time! Who'd have thought - cowpats as the energy of the future!



Stamping on cans can save space in your recycling bin and make room for even more. It can be fun too...

Renewable revolution

Solar, wind, biomass – these are all renewable sources of energy. That means there is always more to be had, unlike the fossil fuels. At the moment, only 3% of the UK's electricity comes from renewable sources! Your mission, should you choose to accept it, is to increase this miniscule proportion. You are not alone in your task! The Energy Saving Trust (www.est.org.uk) and Clear Skies (www.clear-skies.org) help households and communities who want to switch to renewable energy. Spread the word!

WORLD GONE MAD WARNING: NUCLEAR POWER

Nuclear power, Super Kids, is a high tech way of making energy which is completely renewable, because it involves breaking open the tiniest part of cells - nuclear fission, inside massive machines called reactors. This is a process which can be repeated over and over and does not require loads of materials like fossil fuels. But nuclear has an evil side-effect...

Imagine superkid if you invented something which could attack the recipe by which all humans are made, our DNA. DNA is the stuff which tells a dog to have a waggy tail, a human to have a round head and walk on two legs, a scorpion to run around being scary, a cheetah to be fast. DNA is the code, the set of rules, the bottom line for every living thing.

Well, it's stranger than fiction, superkids, weirder than the X file than Buffy, but humans are now nuclear energy from a process which produces as its waste, radioactive material which messes around with our DNA.

It really is the stuff of nightmares Super Kid, for it takes thousands of years for this waste to become harmless and meanwhile, it has to be stored somewhere.

Don't let them convince you that nuclear power is the answer superkid., Campaign against it www.cnd.org.

SUPERFACT
Radioactive sand has been found on Scottish islands from Sellafield nuclear power station; some has been found as far away as Greenland, Norway and Northern Ireland.



Nuclear power is the stuff of nightmares.

SUPERFACT

The citizens of rich countries consume around 30 times as much energy and resources as those of the Third World. For example, the 120 million Japanese have a greater impact on world resources than the 1.5 billion people of India and China put together.

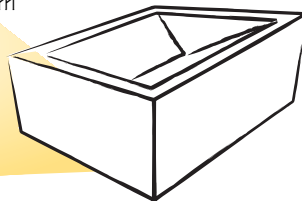
Sneaky bills

If the zombie parents insist that the installation of solar panels or wind-turbine is not for them, sneak a peek at the electricity and gas bills sometime. Who sells you the energy to power your super-hero home? If they haven't got a RENEWABLE ENERGY TARIFF, use all available methods of persuasion to get your parents to organise one!

What this means is that the energy company supplies you with electricity from renewable sources, so the more people who have this kind of tariff, the more people will come to rely on renewables instead of stinky fossil fuels or scary nuclear. Energy suppliers with good renewable tariffs include: www.ecotricity.co.uk, www.unit-e.co.uk and www.nieenergy.co.uk

Make bricks

If you have an open fire at home, you can buy a kit from CAT, or Natural collection, to make bricks from newspaper. You soak your newspaper, squash it into the brick maker and leave it to dry. The results burn for hours and manage to recycle, reuse and reduce all at once. Visit www.cat.org.uk



Get efficient

For the moment, almost all our energy comes from burning fossil fuels, so it makes sense to use as little energy as we can (no I don't mean you get to laze about all day!) Small changes, if we all make them, will add up to a huge energy saving, which will mean less carbon dioxide in the atmosphere, and less risk of global warming!



The idea is to burn the old brick newspapers, not read them