

Energy Savers

Pre-visit Activity

Our bodies use energy when we do things. We use energy when we walk, move our mouth to talk, when our heart beats or just to move our lungs when breathing. We get our energy from the food we eat. If you read the packet breakfast cereal comes in, it has the amount of energy the cereal contains. It is measured in kilojoules (kJ). We measure distance in metres and kilometres, we measure energy in kilojoules.

The energy in the food we eat comes from the sun. The sun's rays, which warm our bodies are a form of energy. Green plants are very special. The green leaves trap the sun's energy and combine it with water and carbon dioxide gas from the air to make food the plants need for growth. Photosynthesis is the process whereby green leaves combine sunlight, carbon dioxide and water to make food.

When animals eat plants they get some of the energy too. If an animal eats another animal it also gets some of that original energy. This transfer of energy from the sun to the green plant to the animal is called a food chain.

The energy from the sun's rays not only goes into the food chain. It is transferred into a lot of other things too. Energy from the sun heats the air which then rises and creates the winds which then have energy. The energy in wind blows sailing boats along and windmills on farms for pumping water or there may be so much energy it becomes a destructive cyclone. The wind also makes waves in the ocean. Surfboard riders use the energy in waves.

Coal and petrol (fossil fuels) are formed from the fossilised remains of plants. We use the energy trapped in coal and oil to burn which releases heat energy. In Australia we burn coal in power stations to heat water to make steam which turns a turbine which is used to produce

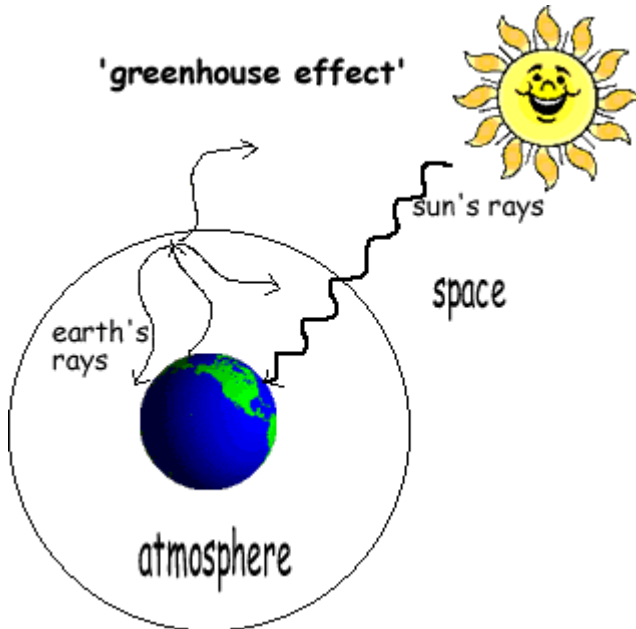
electricity. This is a very important form of energy which we use in our homes for lighting, heating and cooking.

Unfortunately burning coal and using petrol in cars produces carbon dioxide which is a greenhouse gas. This is causing the earth to get warmer and change our climate. In future we will need to stop using so much coal and oil for energy and use less polluting forms such as hydro-electricity, wind power and direct solar power.

1. We obtain energy by eating f _ _ _
2. We measure distance in metres and energy in K _ _ _ _ _ _ _ _
3. All energy in the food we eat originally came from the _ _ _
4. The process of combining sunlight, carbon dioxide gas and water in green plants is called p _ _ _ _ _ _ _ _ _ _
5. A food chain is the flow of energy from the s _ _ to p _ _ _ _ s to a _ _ _ _ _
6. Energy from the sun is transferred to energy in ocean w _ _ _ s and w _ _ _ in the air.
7. Coal and oil are known as f _ _ _ _ _ f _ _ _ s
8. We make e _ _ _ _ _ _ _ _ by burning fossil fuels in power stations.
9. Name one 'greenhouse' gas produced from burning coal and petrol.

10. Name three alternative source of energy to coal and petrol.

'greenhouse effect'



World Environment Day: 5 June Global warming, the greenhouse effect and me.

The Earth's atmosphere allows sunlight in but stops some of our heat rays from leaving. Some gases in the atmosphere, we call *greenhouse gases*, trap the heat before it can escape to space. This is a natural effect which keeps the Earth and us warm. Without the natural greenhouse effect the average temperature of the earth would be a chilly minus 18 degrees

Celsius. The activity of people, including you and me, is generating extra *greenhouse gases*. Most scientists think this is causing the Earth's temperature to slowly rise, global warming, which is causing the climate to change.

1. One kilogram of greenhouse gas has a volume of 556 litres, about the size of a large fridge. How many 2 litre milk containers would one kilogram of greenhouse gas fill?

2. If the total weight of students in a class is a tonne (1 000 kilograms) and the average weight of each student is 40 kg. How many students are in the class? What is the total weight of students in your class if each person weighs 40 kg?

3. The average Australian household releases 18 tonnes of greenhouse gas to the atmosphere each year. How many litres is this?



4. If you live in a small community with 10 houses, how many litres would you all release into the atmosphere?



5. A car produces 2.5 kg of greenhouse gas for each litre of petrol it uses. How many kilograms of greenhouse gas does the car produce if it uses 10 litres of petrol?



6. Food and garden waste generates 3.5 kg of greenhouse gas for each kilogram of waste which decomposes in a compost or landfill site. How many kilograms of greenhouse gas does your family generate in a year if your weekly waste is 5 kg?

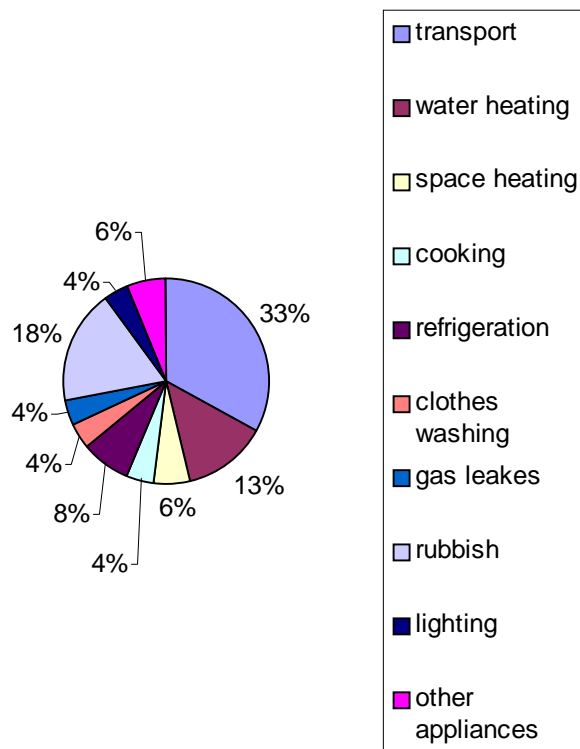
Most of the power for our homes is in the form of electricity. To make electricity, coal is burnt in power stations. One kilogram of greenhouse gas is produced when when we make one kilowatt hour of electricity. One kilowatt per hour of electricity is used when a 100 watt light bulb is left on for 10 hours or a small 1 000 kw fan heater is used for one hour.



7. Every 15 litres of hot water used from an electric hot water heater generates about a kilogram of greenhouse gas. How many kilograms of greenhouse gas do you produce if you take a shower which uses 105 litres of hot water?

8. An electric kettle generates about one kilogram of greenhouse gas for every 10 litres of water boiled. How much gas would you produce if you had 4 people drinking 3 cups of tea each day for 7 days and each cup held 250 mls of water?

An average Australian family's greenhouse gas emissions. Pie graph: transport is 33% then the categories are in order in a clockwise direction.



9. Which category is the second largest contributor?

10. What percentage does home lighting contribute?

11. What is the total of the 3 largest categories?

12. The contribution for rubbish is quite large. This occurs when the rubbish is at the landfill tip. What do you think happens to the rubbish there to make greenhouse gases?

13. Name 2 sources of energy which we could use in our homes instead of electricity.

14. Name 5 ways you could reduce your contribution of greenhouse gases to the atmosphere and to global warming by limiting the amount of electricity or petrol you use.