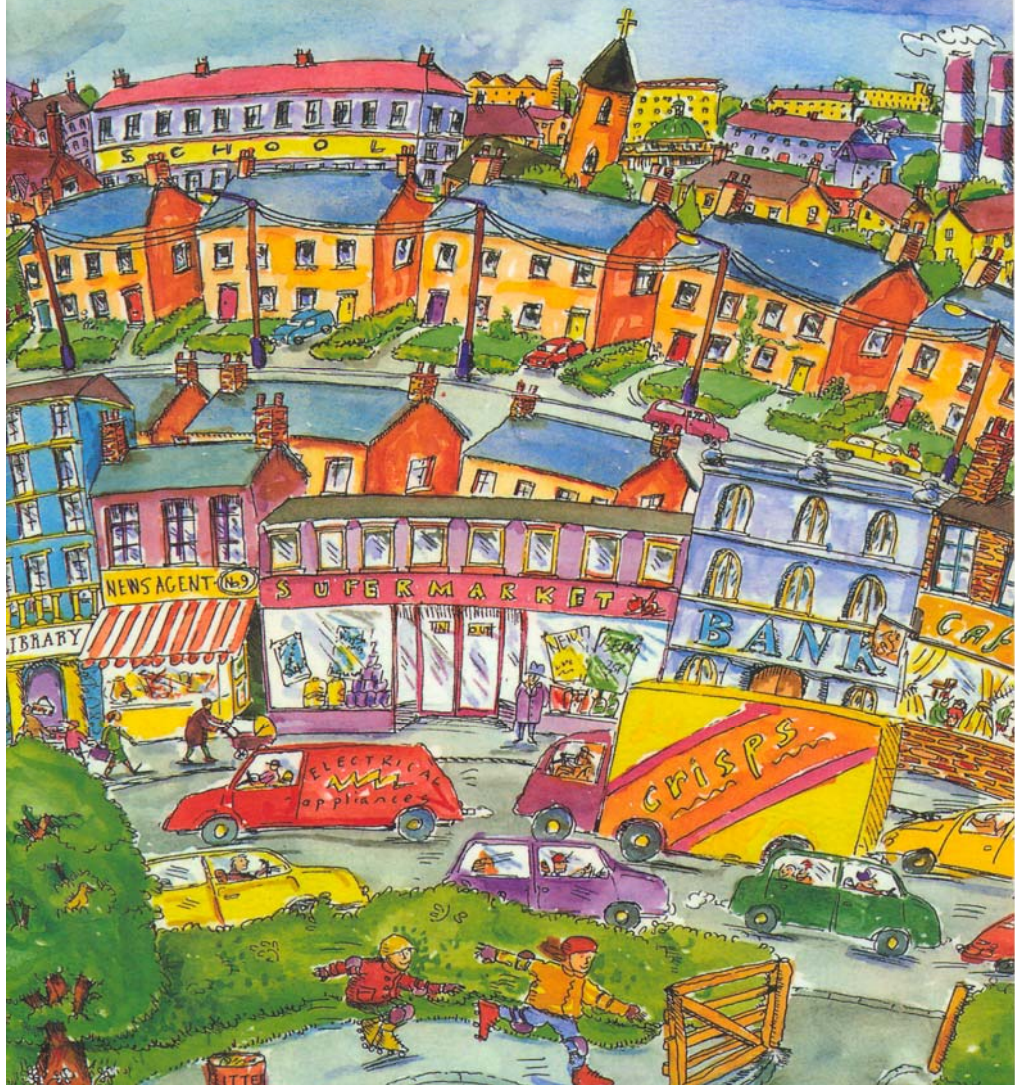


# ENERGY IN OUR LIVES



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# 1. ENERGY



**We use energy to make things happen.**

We use energy to move and keep warm.

We use energy to light our homes.

We use energy to make sounds.

We use energy to light a torch.

**There are different types of energy.**

**Mechanical ( Kinetic ) Energy** makes things move.

Wind blowing a sail boat.

A river turning a water wheel.

Someone pedalling a bicycle.



**Chemical Energy** is energy which is stored and is only released when a chemical reaction takes place.



A torch gets energy from a **chemical reaction** in the battery.

**Electrical Energy** which flows as an electric current, is used to run:

Computers.  
Televisions.  
Washing machines.  
Lights.



**Nuclear Energy** is made from uranium. This energy is used to generate electricity.



**Sound energy** is actually the air vibrating. Our ears translate the tiny air movements into sound messages in our brains.



### **Heat and Light Energy**

Light bulbs produce light and heat.  
Fires produce light and heat also.



**Energy resources are used to provide energy. There are two types:**

- **Renewable Energy Sources**

These energy resources can be used over and over again without running out.

The sun gives us light and heat.

The wind blows over land and sea moving boats and windmills.

Crops are grown each year to give us food.



- **Non-Renewable Energy Resources**

These energy resources take many thousands of years to form. When they run out they can not be replaced.

**Fossil Fuels.** Oil , peat, and coal are fossil fuels. When they are used up, there will be no more fossil fuels left.

**Nuclear fuel.** When all the uranium is used, there will be no nuclear fuel left.

Both **renewable** and **non-renewable** energy resources are used to generate electricity. In Northern Ireland and in the Republic of Ireland electricity is generated using coal ,oil , gas, peat, moving water ( hydro-electricity) and wind. Nuclear energy is not used in Ireland.



## 2. OUR BODIES NEED ENERGY

**We need energy for everything we do.**

To keep us warm.  
To keep us healthy.  
So that we can grow.  
So that we can walk, run, skip, and jump.



**Some activities require lots of energy.**



Playing football.  
Cycling a bicycle.  
Rollerblading.

**Other activities need less energy.**

Sleeping.  
Watching television.  
Walking slowly.



**Some people need lots of energy.**

An Athlete.  
An Olympic swimmer.  
A growing child



**While other people need less energy.**

An Older person.



**Food is the fuel that gives us energy.**

Food like sweets cake and crisps give us lots of energy. If we do not use all the energy they give us, we store it as **fat**.

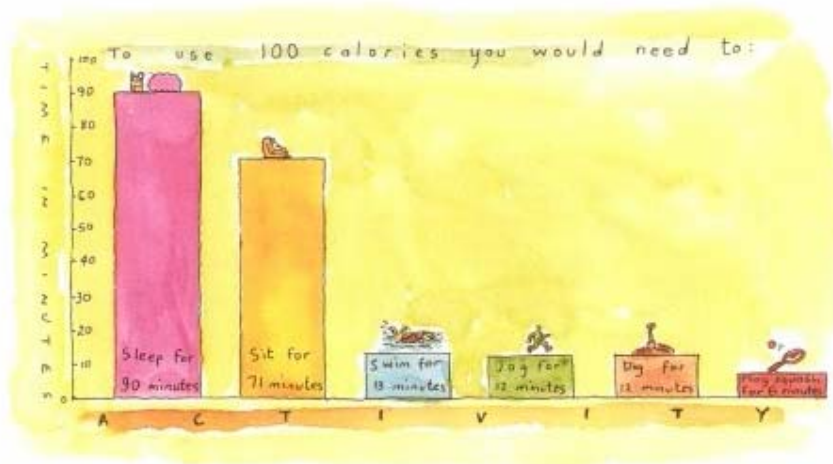


Food like fruit, fish and salad do not give us as much of energy but contain essential vitamins and minerals.

A healthy diet contains food which is high in energy and food which provides us with all the **vitamins** and **minerals** we need.

The energy in our food is measured in **calories**. Children, who are still growing, need lots of **calories**.

**This bar chart shows the amount of calories we use, doing different things.**



**Food gets its energy from the sun.**



### 3. ENERGY IN EVERYTHING

Energy is used in every aspect of our lives.

There is energy in everything we do and in everything around us.

In the food we eat.

In the petrol we use in our cars.

In the fuel we put in our fires.

In the electricity we use.

These pictures show the energy needed to make a packet of crisps.



The picture below shows the different ways in which energy might be used in just one room, the kitchen:

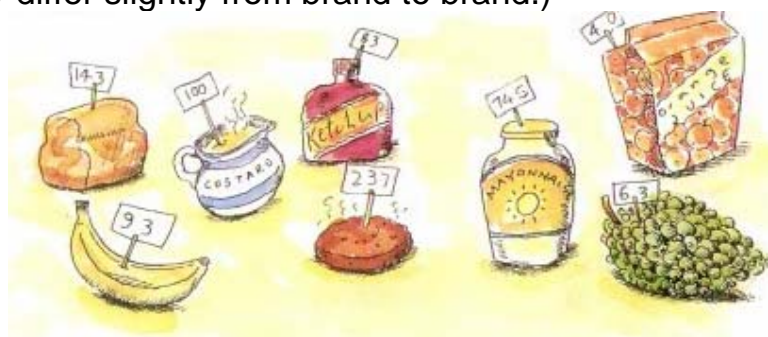


## 4. MEASURING ENERGY

### Calories

The amount of energy we get from food is measured in kilo-calories, we usually call them **calories**. You will see Kcal written on packets of food.

Here the number of calories in 100g of different foods.  
(This may differ slightly from brand to brand.)



### Kilowatt hours (kWh)

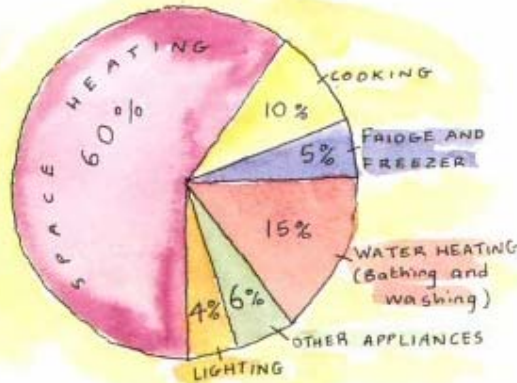
Food energy is measured in calories while fuel and electrical energy is often measured in kilowatt hours. This is written as kWh which appears on gas and electricity bills where it shows how many units of energy have been used.

For example, ten 100 watt light bulbs use 1kWh in an hour.

Here are some electrical appliances and estimates of how many units of energy (kWh) each one would use in a year.



Below you can see a pie chart of where we use energy in our homes. You can see that most of our energy goes on heating.



## Litres

The amount of oil, petrol and diesel we use is measured in litres or gallons. One litre of fuel contains 10.5kWh. One gallon of oil contains about 47.7kWh. Cars can travel farther on a gallon of fuel than a bus or a train, but buses and trains can carry more people.



A **car** with **1 gallon of fuel** can carry 5 passengers 40 miles. That is **200 passenger miles** per gallon.

A **train** with **1 gallon of fuel** will carry 700 passengers 1 mile. That is **700 passenger miles** per gallon.



A **bus** with **1 gallon of fuel** will carry 72 passengers 7 miles. That is **504 passenger miles** per gallon.



## 5. WE DEPEND ON ENERGY

Today we depend on energy resources like **oil, gas, petrol, or electricity** in almost everything we do.



In the past people had to do far more by hand using only their own energy or the energy of their animals.



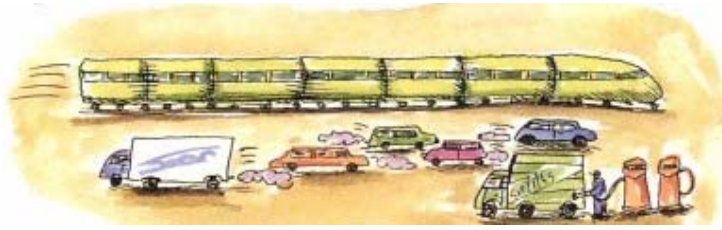
For most people life today is easier, warmer and more hygienic than it was in our grandparents' or great - grandparents' time.



We use more **oil**, than any other **non - renewable energy resource**.

It is used to make **petrol** and **diesel** for

Cars.  
Homes.  
Buses.  
Trains.



It is also used in aviation fuels

Oil heats thousands of

Homes  
Schools  
Offices  
Factories  
Shops



It is also used in **power stations** to generate much of our electricity.

Electricity has transformed our lives more than any other type of energy.

Without electricity we would not be able to use



Telephones. Televisions and videos. Computers. Household appliances such as fridges, washing machines and microwaves. Life saving equipment in hospitals.

We have become almost totally dependent on electricity. If there is a power cut, we can quickly see how much we have come to depend on it.



Nowadays the countries in the developed world, like Ireland, use much more energy than those in the developing world like Africa. For example in 1978 the average person in America used 15 times more energy than the average person in Turkey.



## 6. ENERGY LONG AGO

People have not always used as much energy as we use today.

### STONE AGE PEOPLE

Primitive people, who lived on earth around one million years ago, used only energy from their food. They hunted animals with simple bows and arrows. They ate the meat from animals and birds, they gathered plants, nuts and berries from the wild. When possible they lived in caves, otherwise they found shelter wherever they could. They had no fuel for transport, agriculture or industry. They did burn wood for cooking and as protection against wolves, bears and other animals.

As people developed new skills like making metal tools and discovering the wheel, the Stone Age came to an end. Lifestyles became more developed and required even more energy.



## **CELTS**

Celtic houses consisted of one room. The fireplace was built in the centre of the room in a simple open hearth. Charcoal was burnt in the fire which was used for cooking and heating.

Above the fireplace there was a hole in the thatched roof so smoke could escape. Bread was baked on hot flagstones in front of the hearth.

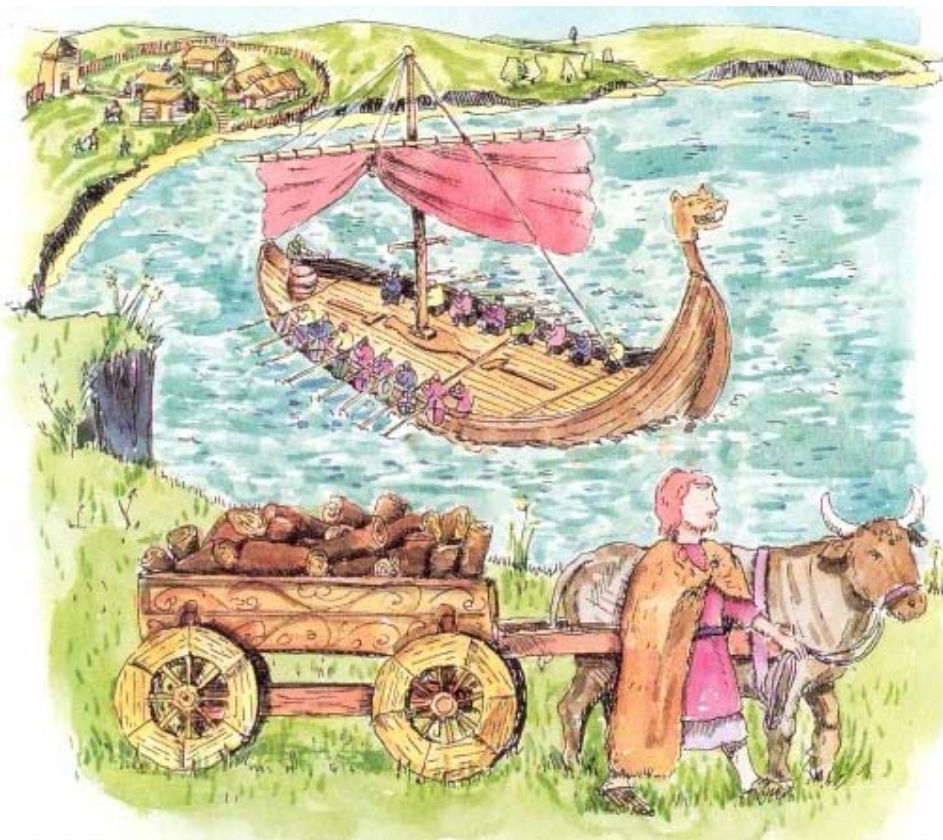
The Celts hunted for food either on foot or horseback. When travelling across country the Celts used chariots pulled by ponies. When possible they travelled by water. Their boats were made from wood and animal skin. These boats depended on human power for the energy.

### ***ILLUSTRATIONS***

## VIKINGS

Viking houses, like those excavated at Wood Quay in Dublin, were a single room. The fire place was built in the centre of the floor and was set in a rectangular stone kerb. Wood was burnt in the fire, which was used for heating and cooking. Above the fireplace, there was a hole in the thatched roof for smoke to escape. An oil lamp was used for light when it was dark. The oil burned was from fish or whales. There was no windows, just two doors at the opposite ends of the long narrow building.

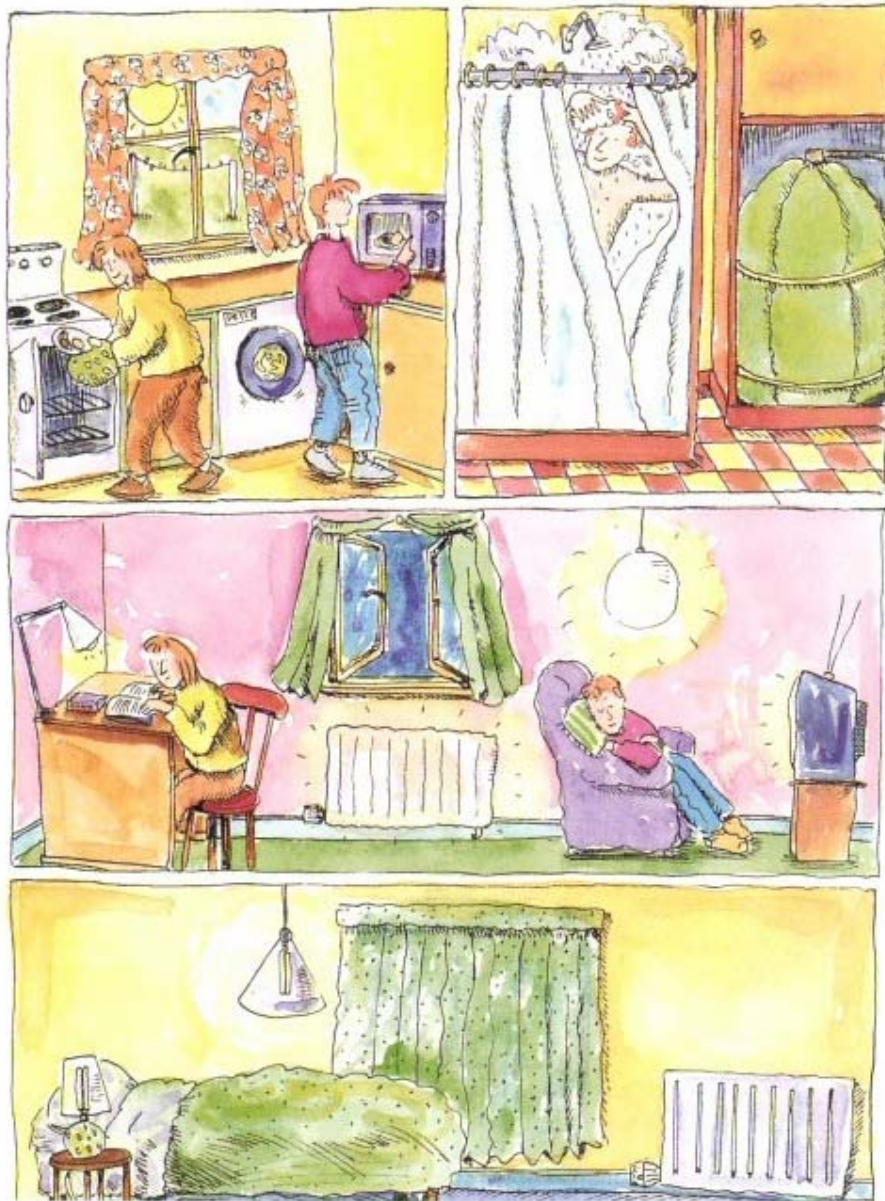
The Vikings made goods and did a lot of trading. They imported and exported goods using their specially designed cargo ships (knorrs). These ships relied on wind and human power (oarsmen) for the energy. When travelling across land the Vikings used slaves or bullocks and carts to transport their goods.



Since the industrial revolution, when people learnt how to put coal to a great many uses our energy consumption has grown. Coal was used to power factories, and steam engines allowed the development of travel by rail. Today we have a wider range of services and goods available to us than ever before, but the environment has been damaged by our increasing energy use.

## 7. SAVING ENERGY AT HOME.

Here are some clever tips on how to save energy at home.



## Here is your energy saving checklist for home

There are many ways to **save energy**



Take a shower instead of a bath. This will use less than half the energy needed to heat bath water. It also saves water.



Switch off lights when you do not need them. If you leave lights on when you are not in the room, it wastes electricity and money.



Switch off the television when you are not watching it. If you leave the television on when you are not watching a programme or when you leave the room you are wasting energy and money. The same goes for the radio, CD or cassette player



Close the curtains in the evening time to keep the heat in. If the heat is turned on and the curtains are left open, lots of heat is escaping through the window. This is wasting energy.



When the kettle is being boiled, use only the amount of water you need. If you boil a full kettle of water to make a single cup of coffee, you are wasting energy.



Always wait until the dishwasher and washing machine are full before you turn them on. Only half filling these appliances wastes energy.



Use renewable resources, dry your washing on the clothes line instead of in the tumble drier, this will save you money too.

Adults, too, can help to save energy by

Lagging hot water pipes and fitting the hot water tank with a lagging jacket

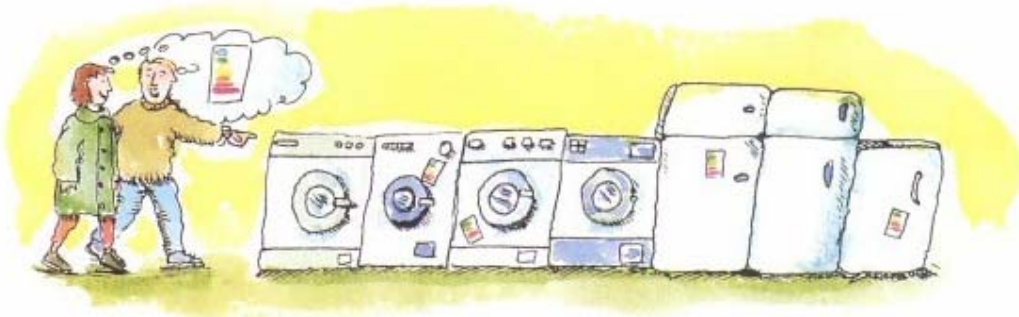
Insulating roofs

Lining the curtains

Putting thermostats on radiators

Fitting double glazed windows and doors

Choose energy efficient appliances by looking for the Energy Label when buying a new washing machine or fridge.



## 8. SAVING ENERGY AT SCHOOL

There are many ways to save energy at school. Can you find them?



Energy is used in schools in a number of different ways:

You need energy **to get you to school**: your own food energy if you are walking or cycling, energy from petrol or diesel if you are driven to school in a bus or car.

Energy is used to **heat** classrooms, assembly halls and corridors. Your school will have **lights** in every room. Energy is needed to make the water hot and to bring water to the tap.

Computers, videos and tape-recorders all need electrical energy. So do telephones fax machines and photocopiers.

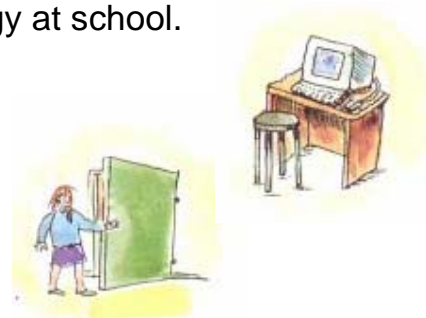
All schools use paper, and other materials which take energy to make.



### Here is your energy saving checklist for the school

There are many ways to help save energy at school.

Switch off lights and equipment when you do not need them.



Close the doors to keep in the heat.



Recycle cans and paper.  
Walk or cycle to school.



Use a lunch box instead of plastic bags or tin foil.

## The Energy Team

Some schools have a group of pupils called The Energy Team. The Energy Team has a teacher as a co-ordinator and a representative from each class. The class representative has to report to the energy team on what their class has been doing about energy.



Here are examples of what some classes have done.

“We checked classrooms during lunchtime and found lights on and doors and windows open when the heating was on. We left a note on the blackboard to remind pupils to save energy by switching off lights and closing doors and windows”.

“Our class organised boxes for waste paper, cans and bottles, in all the rooms in the school. This saves energy because all our paper, cans and glass are saved for recycling”.

“Our class noticed that boxes had been stacked in front of the radiators in the hall. The boxes were getting hot but the hall was cold. This was a waste of heat. We asked the principal to remove them”.

“Although the weather is becoming warmer our class is still being heated. People started opening windows to cool the classroom. We asked the teacher to have the heating turned off as it was wasting energy”.

You could do something like this in your school.

