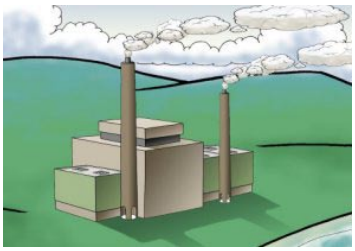
Mission 1:



What is Energy?

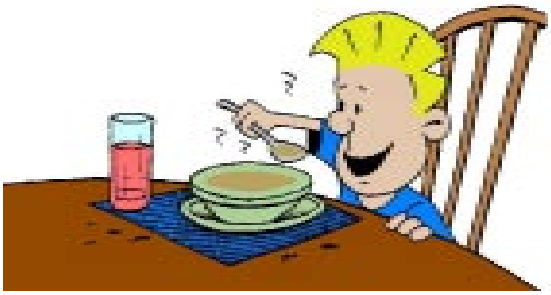
energy saving trust™

Bryson Charitable Group

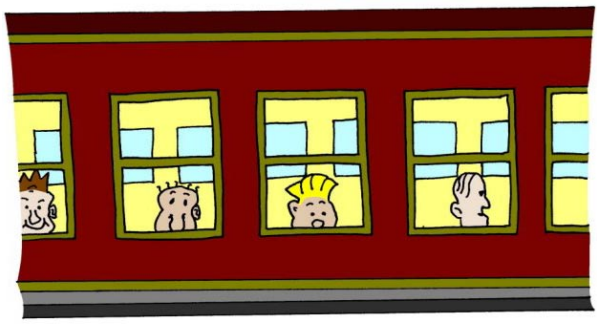
What Do We Need Energy For?

It's eight o'clock in the morning and Nathan is still asleep. Is he using ENERGY?

The alarm clock goes off. Nathan wakes up and gets ready for school. Is he using ENERGY?



Time for some breakfast. Is he using ENERGY?



Nathan is travelling to school by bus. Is he using ENERGY?

Nathan working hard in school. Is he using ENERGY?

Nathan is home again, finished his homework and settled down to watch some television. Is he using ENERGY?

Energy is a very important part of all our lives.We are using energy all the time, even when we are asleep.ENERGY is the POWER that makes things WORK.

What Do We Need Energy For?

In the box below, list some of the different things you do that use energy.

TIME	WHAT DID I NEED ENERGY FOR?
Morning	
Lunchtime	
Evening	
Bedtime	

Circle the correct answer to make each of the following sentences true.

1. We **do not / do** use energy when we are asleep.
2. We use a lot of energy when we are **running / sitting**.
3. An engine **does not / does** need energy.
4. When we move we are **using / not using** energy.

Cut out or draw pictures in the box below to show things which need energy to make them work.

Where Does Energy Come From?

I can think of loads of things that need energy to make them work!
A tree needs energy to grow...
Our bodies need energy to move...
A car needs energy to go...
But hang on Sparky, where does all this energy come from?

Well Nathan, an ENERGY RESOURCE is something that is used to provide energy.
There are lots of different energy resources...

The sun is an energy resource for trees and plants.

Food is an energy resource for our bodies.

Petrol is an energy resource for cars and other vehicles.

But all of our energy actually starts off coming from the sun.
Look at this...

Think about when you ride your bike. Where does the energy come from?

Um, my legs?

Exactly. And where did you get the energy from to make your legs work?

Erm...oh, my breakfast - orange juice and weetabix.

O.K. and what made the oranges and the wheat grow to make your breakfast?

THE SUN!

Where Does Energy Come From?

See if you can fill in the energy resources in the table below.

 Energy Resource	 Energy Resource
	
	

Draw 2 more things that need energy to make them work. Write the correct energy resource beside each one.

Put the following sentences in the right order to show how our energy always comes from the sun. Draw a picture to illustrate each sentence...

A tree gets its energy from the sun. A fire gets its energy from wood.

Nathan's house is heated by energy from a fire.

1. Nathan's house is heated by energy from a fire.	2.	3.

A chicken gets its energy from eating corn. Nathan uses energy to play football.

Corn gets its energy from the sun. Nathan ate a boiled egg for his breakfast.

1.Nathan uses energy to play football.	2.	3.	4.

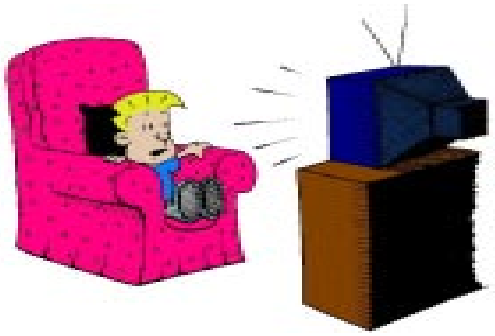
Different Types of Energy

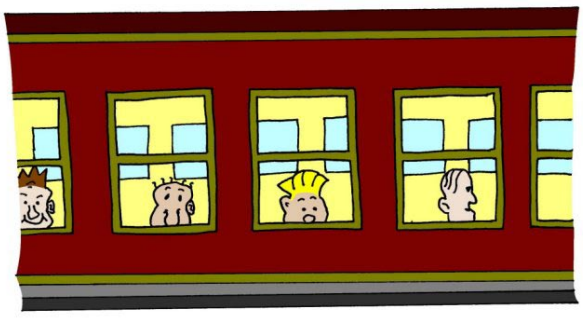
Even when Nathan is asleep he is using energy. Our bodies need and use energy all the time, to keep us healthy and alive.

When our bodies run out of energy we eat. Our bodies change the food we eat and the liquids we drink into **chemical energy**.

Nathan moves around during the day, walking, running etc. This is called **mechanical energy**.

Anything that Nathan plugs into an electric socket, like the television, uses **electrical energy**.





Nathan travels to school by bus, it uses the same energy as a car. They both use petrol. Petrol is a store of **chemical energy**. The engine also uses a battery. This is a store of **electrical energy**.

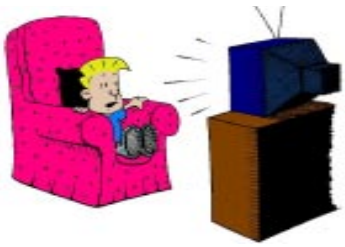
Everything that Nathan does during the day uses different types of ENERGY. We get our energy from the food we eat, cars get it from petrol, televisions from electricity. Energy is being used all the time. Energy is the power that makes things work.

Different Types of Energy

1. What sort of energy do these different things use? The first one has been done for you.

Riding a bicycle	**Electrical energy**
A television	**Mechanical energy**
Your body	**Electrical energy**
Playing football	**Mechanical energy**
A computer	**Chemical energy**

2. In the box below draw some ways that you use energy, write what type of energy you are using beside your drawing.



Watching television uses electrical energy.

3. Finish off these sentences with these words:-

many **power** **change** **everything**

Energy is the _____ that makes things work. We need energy for _____ we do. There are _____ different kinds of energy. Energy can _____ from one kind into another.

Can energy change?

The car or bus, which brings you to school gets its energy from petrol and a battery. The petrol stores **chemical energy** and the battery stores **electrical energy**.

The engine changes this **chemical energy** and **electrical energy** into different types of energy.

What happens when a car or bus is started? What do you hear, see, smell and feel?

When the engine starts, we switch on the radio or beep the horn , we can hear it. This is **sound energy**.

When it is dark we switch on the headlamps. This is **light energy**.

After the car has been running for a while the bonnet becomes warm. This is **heat energy**. Heat energy is always produced when things work. When you run about you get hot.

When we drive about, the car is moving. This is **mechanical energy**.

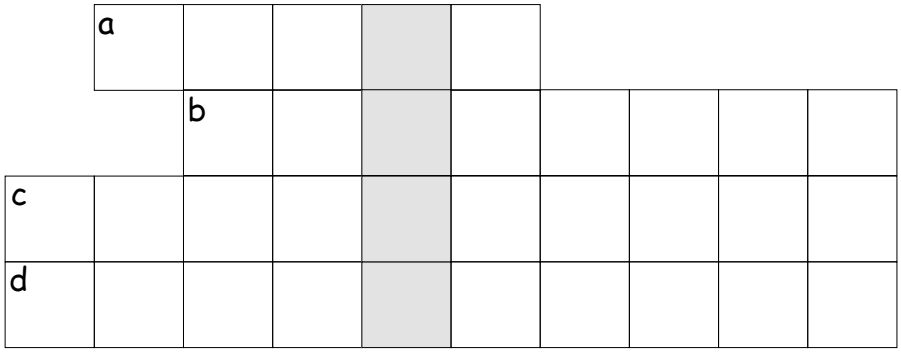
ENERGY can change from one form into another.

It cannot be created or destroyed!

Quiz - Types of Energy

1. WORD PUZZLE

   a. What kind of energy shines from the front of the car?
   b. What kind of energy is in the petrol?
   c. What kind of energy makes the car move?
   d. What kind of energy is turned into light?



   e. The grey boxes will spell a word vertically. This type of energy is always produced by energy changes. The mystery word is _____

2. Here are some other ways energy changes.

   Look at each one and try to wrok out what the two main kinds of energy are.

mechanical	**electrical**	**chemical**	**sound**	**heat**	**light**

   a. A drum changes **mechanical** energy into **sound** energy.

   b. A electric heater changes _____ energy into _____ energy.

   c. A light bulb changes _____ energy into _____ energy.

   d. Our bodies change _____energy into _____ energy.

   e. A kettle changes _____ energy into _____ energy.

Quiz - Types of Energy

3. Energy can be said to be moving (Kinetic energy) or stored (Potential energy). Something which is moving like a car is using kinetic energy, something which stores energy like a battery has potential energy.

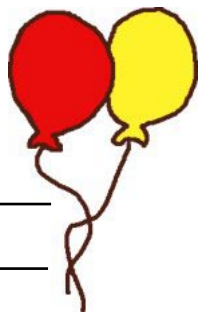
Complete the table below by putting the following things into the right box.

Car Coal Sandwich Wind Battery

Water Oil Motorcycle Apple Wave Gas

Kinetic energy (moving)	Potential energy (stored)

4a. A battery stores energy and so does a blown up balloon.
Blow up a bolloon and let it go.
What happened?



_____

_____

_____

4b. How do you change the balloon's potential energy into sound energy?

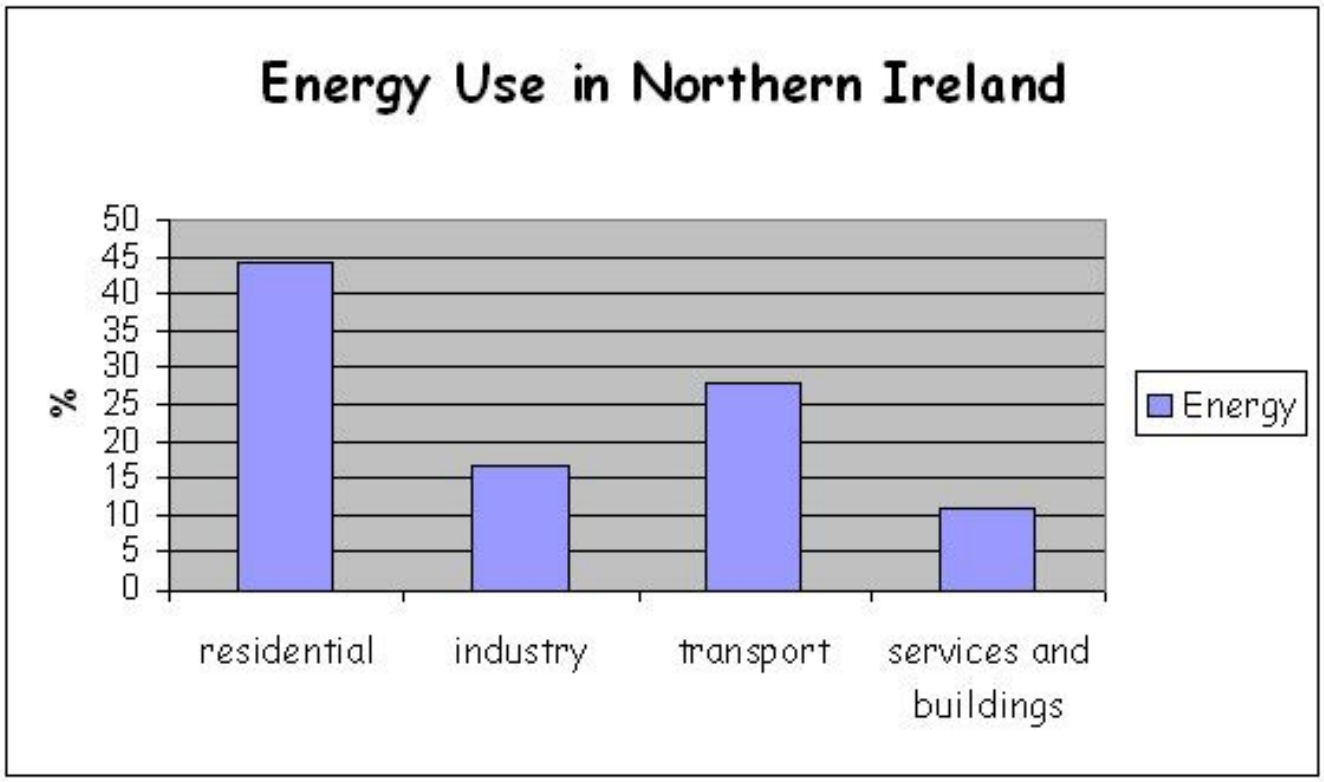
_____

_____

_____

Quiz - Energy Use

1. Study the energy bar graph below and then answer the questions.



(Figures from:The Carbon Trust, 2002)

a. What uses the most energy?_____

b. What percent does transport use? _____

c. Which of the things use 11% of all the energy?_____

d. What percentage does industry use? _____

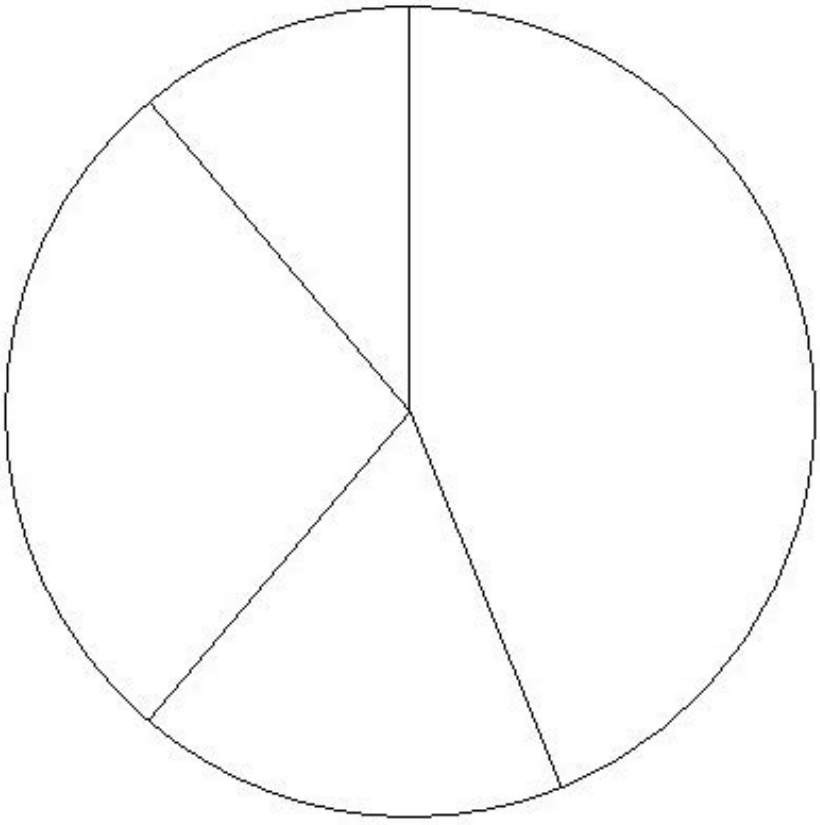
e. What is the total percentage of energy used in Northern Ireland?

_____

Quiz - Energy Use

2. Study the pie chart below, it shows exactly the same thing as the bar graph. First give it a title.

Title: _____



☐ residential

☐ industry

☐ transport

☐ services and buildings

(Figures from:The Carbon Trust, 2002)

a. Choose a colour for each of the uses, and colour in the key.

b. Look at the sizes of the five slices. Write the correct percentage into each pie:- 44%, 28%, 17%, and 11%.

c. Label each pie to show what it stands for, you will need to look at the bar graph to help you.

c. Now, colour in each slice in the same colour you used for your key.

Energy Investigations

1. A very easy way to see energy changing from one form into another is to rub your hands together really hard. Keep going for as long as you can.
Circle the correct answer below.

a. What sort of energy is that movement?

Mechanical **Chemical** **Electrical**

b. How do your hands feel?

Warm **Cold** **Hot**

This is called **friction** and is **mechanical** energy being changed into **heat** energy.

2. How many different kinds of energy are there when you use hairdryer?
Answer the following questions to find out.

a. Where did the hairdryer get its energy from?

b. What happened when it was switched on? What did you hear, see and feel?

c. How many different kinds of energy are there?

d. Name all the types of energy used and produced by the hairdryer.

Keywords and Definitions

Energy	The power that makes things work.
Electrical Energy	The ability of the electric current to do work. Measured in kilo-watt hours.
Mechanical Energy	The energy of movement. Used by machines, animals and people.
Watt	The unit of power. It is a measure of the rate at which an appliance uses electrical energy.