

What do you know about energy?

Name _____ Class _____

Ideas about energy

Some people were talking about energy. The things they said are written in the table below. Discuss what they said and decide if you think they are:

- definitely true, or
- definitely false, or
- you are not sure.

Be ready to explain to others why you made your choice.

Complete the table. Tick ✓ just one box for each statement.

	Definitely true	Definitely false	Not sure
'Only living things need energy'			
'Fuels make things go – but they have nothing to do with energy'			
'When fuels burn, they release energy'			
'You can measure energy'			
'Only foods containing sugar give you energy'			
'We will always be able to extract more oil from under the ground to give us the energy we need'			
'There is less energy in the world today than there was a million years ago'			
'Energy can be stored'			
'A bowl of rice gives you more energy than a bowl of sugar'			
'People today use more energy than their grandparents did'			

Name _____ Class _____

- Match up each form of energy to a correct picture.
Draw a line to join them up. One has been done for you.

Energy can be stored in a wound up spring

Energy can be stored in your body and used when you need it

Heat energy

Energy can be stored in something which is high up off the ground

Light energy

Energy can be stored in a battery. When it is connected up the energy is transferred into electrical energy

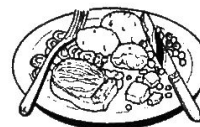
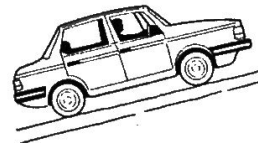
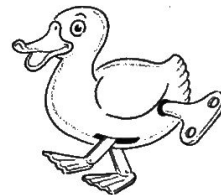
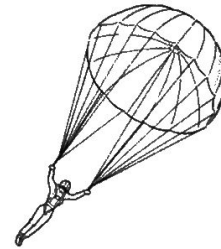
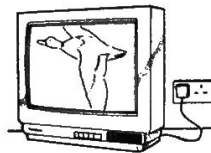
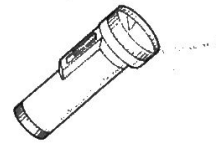
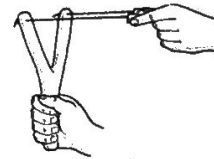
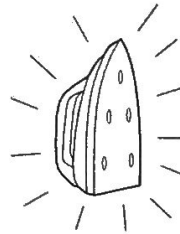
Electrical energy

Sound energy

Energy can be stored in foods and fuels

Movement energy

Energy can be stored in something which has been stretched like a balloon or a rubber band



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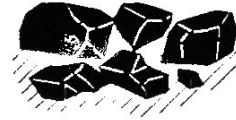
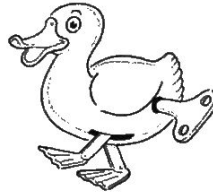
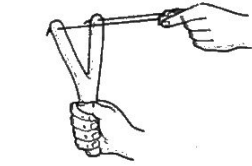
Go with energy

Extra Help

Name _____ Class _____

- Which kind of stored energy is shown in each of the diagrams below? Fill in the spaces using the words in the box.

chemical strain gravitational

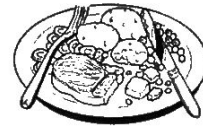
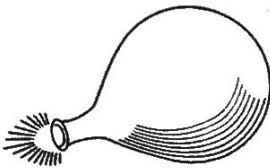


_____ energy

_____ energy

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A steam engine

Extra Help

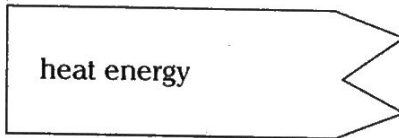
Name _____ Class _____

- For each energy transfer, fill in the spaces using the words in the boxes.

(a) A steam engine lifting a weight.

gravitational chemical movement

_____ energy stored in the fuel



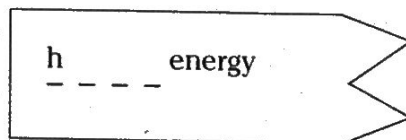
_____ energy gained by the weight as it moves up.

_____ energy of the turning flywheel.

(b) A steam engine making electricity.

movement light fuel heat

chemical energy stored in the f



m _____ energy of the turning dynamo.

l _____ energy of the bulb.

Name _____ Class _____

In your group read the following story. You will be asked to find different sources and types of energy, so look out for them.

Simone and Shazia decided to go skiing. They went to the bus stop to get a bus to the dry ski slope. From the top of the road they saw their bus moving towards them and then stop. They felt heat coming from the engine of the bus and Shazia coughed when the smoke fumes went down her throat.

The girls got on the bus. Simone said that the fumes came from the petrol that is a form of chemical energy. Shazia nodded and took a bite out of her Kit Kat. She said that the Kit Kat gave her energy to move but also took the horrible taste of petrol fumes from her mouth. Simone decided to listen to her music. She put the batteries into the back of her personal stereo, switched it on and heard the sounds of her favourite band.

Once they got to the dry ski slope they put on their skis and waited for the ski lift to come and take them to the top of the slope.



At the top of the slope the girls adjusted their skis. They looked down the slope and Shazia said that they had a form of potential energy called gravitational energy. Simone smiled and nodded. They both pushed themselves off the top and glided quickly down the slope. Simone got to the bottom first. She told Shazia that the movement energy is called kinetic energy and she was quickest. Shazia laughed and said that she was not trying to race but will beat her next time. The girls moved quickly to the ski lift to have a race down the slope.

1 In your group, underline in **blue** all the types of energy in the story.

2 Now underline in **red** all the sources of energy.

3 Now use the story to help you draw diagrams. These should show the source of the energy and the type of energy it provides. Here is an example.

The Kit Kat, which contains food (chemical) energy, is changed into kinetic energy.

Kit Kat chemical energy —————> kinetic energy

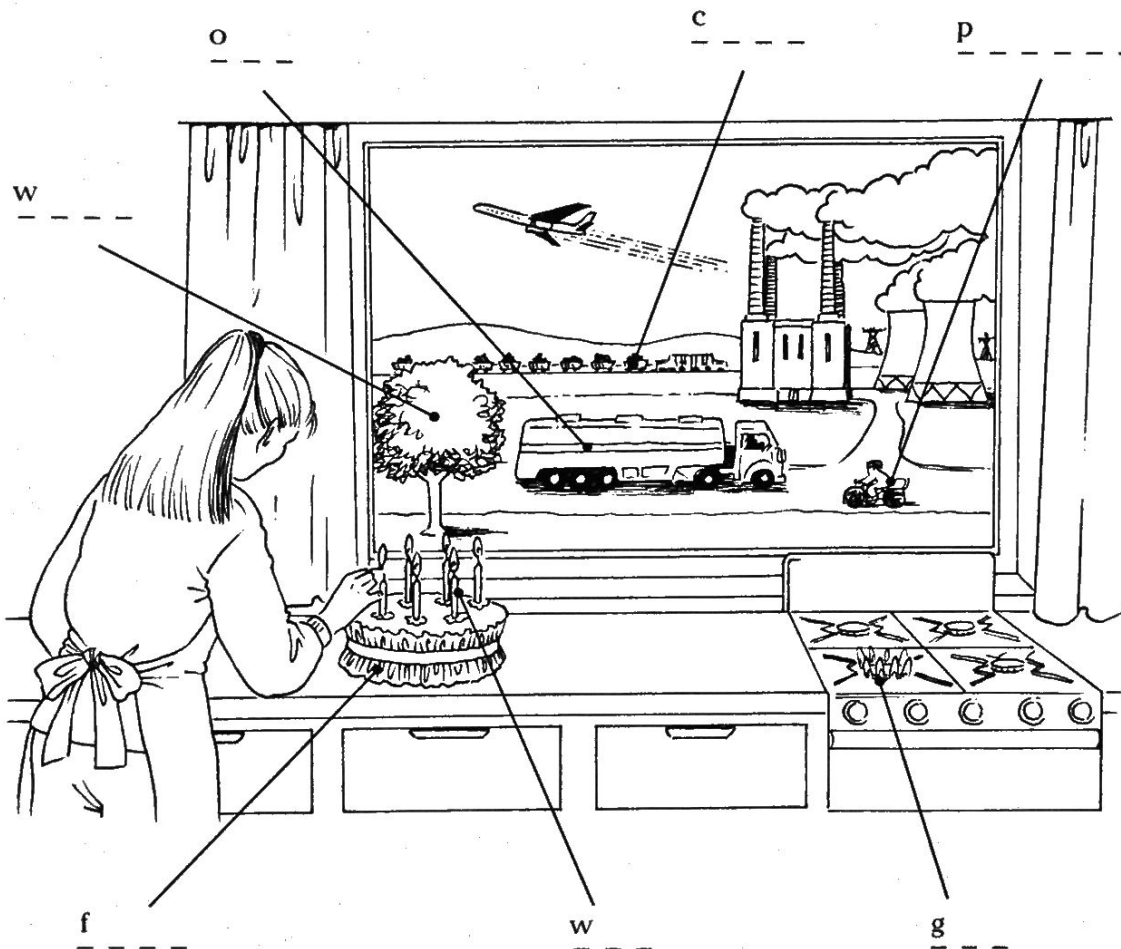
4 In your group make a list of all the types of energy you have used today. Draw diagrams with your examples.

Name _____ Class _____

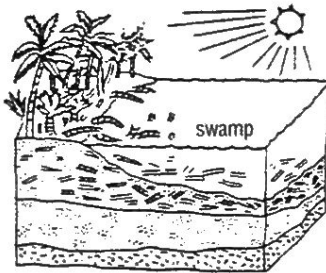
- Look at the fuels written in the box below. See if you can find them in the picture.

gas	wood	oil	petrol	coal	food	wax
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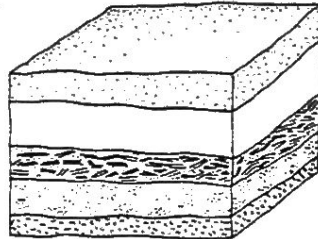
- Label the picture to show where the different fuels are.



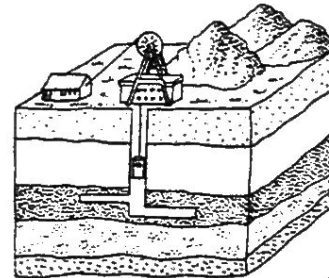
- Look at the fuels again. Underline the ones that are fossil fuels.

How was coal formed?

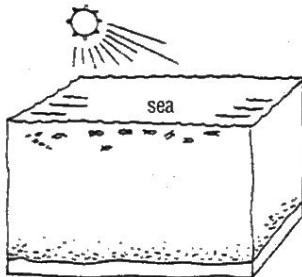
300 million years ago, plants store the Sun's energy. Dead plants fall into swampy water. The mud stops them from rotting away.



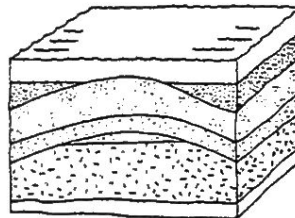
As the mud piles up, it squashes the plants. After millions of years under pressure, the mud becomes rock and the plants become **coal**.



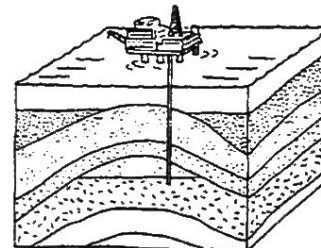
To reach the coal, miners dig shafts and tunnels. There is probably enough coal to last 300 years. Fossils of plants are sometimes found in lumps of coal.

How was oil formed?

Tiny animals and plants live in the sea. When they die, they fall into the mud and sand at the bottom, and don't rot away.



Over millions of years they get buried deeper by the mud and sand. The pressure changes the mud and sand into rock, and the dead animals and plants become **crude oil** and **natural gas**.



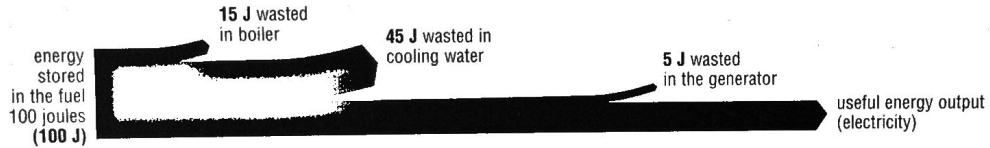
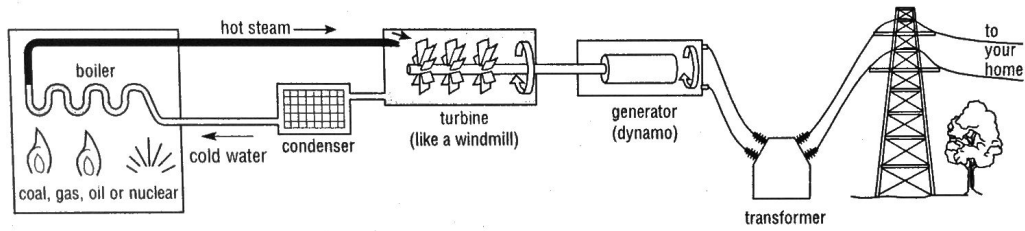
The oil can move upwards through some rocks, but if it meets a layer of hard rock it is trapped (with the gas). An oil rig can drill down to release it. There is enough oil on Earth to last about 40 years.

Questions

- a What is a fossil?
- b Why are coal, oil and gas called fossil fuels?
- c Explain in your own words how coal was formed.
- d Give 2 similarities and 2 differences between the way coal was formed and the way oil was formed.
- e Diana says, "The energy stored in coal, oil and gas all comes from the Sun." Explain this statement.
- f Oil, coal and gas are called **non-renewable** resources. What do you think this means?
- g Why will fossil fuels eventually run out?
- h How old will you be when the oil runs out?
- i Why is coal usually found in layers?
- j Why are some rocks called sedimentary rocks?

Using fuels in a power station

Follow the diagram to see how fuel is burned, to generate electricity:



- What does the boiler do?
- What does the steam do to the turbine?
- What does the generator do?
- For every 100 joules of energy in the fuel, how much comes out as useful energy?
- Where is most energy wasted? Can you think of a way of using this wasted energy?