

Primary School lesson plan

Whether it's cultivating the school's green spaces, running a community litter pick or simply recycling more, students and teachers across the UK are running projects and campaigns which aim to make a difference to the environment and engage students with the curriculum.

We want to support your school's efforts to make the world a better, greener place by giving you the chance to enter the Observer Ethical Awards' Young Green Champions competition and win £5,000 towards your project or idea.

This lesson plan is designed to help teachers generate ideas for the competition by raising awareness of one major subject - energy - and inspiring students to take practical steps to reduce consumption in the school.

Energy consumption is on the rise with all of us having more devices that use electricity. Schools use great amounts of energy and many will have poor energy ratings. The environmental effects associated with generating this power and the effects of global warming and greenhouse gasses are well documented.

Most of our energy we consume comes from fossil fuels and nuclear power, both with obvious environmental drawbacks.

Renewable energy has seen a great rise in the last few years but it still has the smallest share.

The fact that fossil fuels will one day run out and that most of our energy production creates damaging pollution should be reason enough to try to reduce our energy consumption. Less money spent on energy means there is more for other resources and helps to conserve supplies of fossil fuels.

Objectives

The aim of this campaign is to raise awareness of the amount of energy used day to day and to develop strategies to lower consumption that can be implemented across the school to inspire pupils to be more energy conscious and reduce the school's energy bills. It is aimed primarily at Key Stage 2 but there are elements that could be adapted to suit Key Stage 1.

Science activity

Investigate and examine different electrical circuits to see how more power is needed the more electrical items are added to it.

One of the biggest differences in the last 50 years has been the introduction of electrical devices. Some are necessary, others less so; but they all consume power.

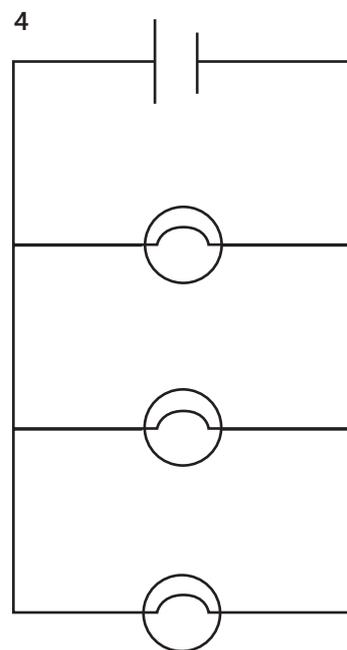
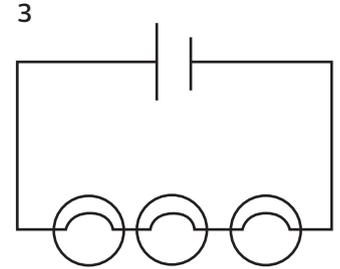
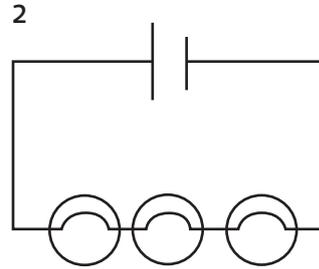
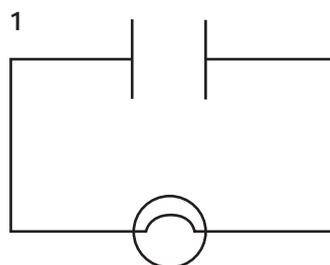
Resources (per group)

3 batteries

3 bulbs

Wires

Begin by giving the pupils equipment to make a simple series circuit with one battery, one bulb and two wires as in circuit diagram 1.



Add the two other bulbs in series - as in circuit diagram 2 and 3 - and notice what happens. The bulbs will dim. Ask the children if there is any way of keeping the bulbs bright. There is if you put them all in a parallel circuit. Have one of these ready and leave it running, although the bulbs are bright, the battery will drain quicker - see circuit diagram 4.

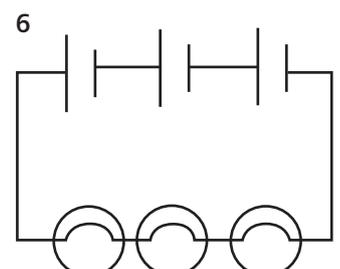
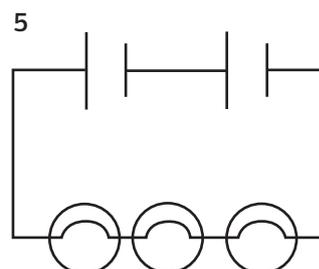
Take your original circuit with three bulbs in the series and add extra batteries one after another - see circuit diagram 5 and 6.

This should make the bulbs brighter. The more bulbs, the more batteries you will need to keep them bright.

In a house or in school the same thing applies, the more electrical appliances you have the more power it takes to make them work. Your consumption of energy is greater.

You could complete this activity with the parallel circuit, using one, two and then three batteries with the three bulbs. Time how long the bulbs take to go out. This is the way our buildings are wired.

This could open up a discussion on where the power comes from. Who will keep buying the batteries? How could a renewable energy source be better?



Maths activity

To make the children aware of how many devices they have, begin with a brainstorm on what different electrical items they use over the course of a week at home and in school.

As homework get the children to write a list of devices that need electricity to run in their homes. Create a spreadsheet of the findings and include a total amount for the class. This could be done as an ICT lesson where the children input their findings onto a shared sheet or database. Use the data to produce a bar or pie charts of the findings.

If each class did this, you could add all the totals up and see how many different electrical items are used across a key stage or the whole school.

Next complete a survey of different electrical devices in the school. Find out how many computers there are, or try counting the amount of strip lights in one classroom or in a hallway; the results can be quite astonishing.

Using what you have discovered

Now you are more aware of the number of appliances, it is time to research the hourly running costs. You will need a calculator to work out the cost.

Appliance	Hourly running cost	How many hours is it used daily?	Weekly cost (hours X no. of days)	Cost per year (X 52)
Strip light	0.4p			
Light bulb (60w)	0.6p			
Computer	7p			
Printer	5p			
Electric heater	10p			
Vacuum cleaner	20p			
Microwave	6.5p			
Fridge freezer	1.5p			
Oven	30p			
Hair dryer	5p			
Hair straighteners	0.3p			
Phone charger	0.01p			
TV	2p			
Games console	7p			

This chart shows the approximate hourly running cost of various common electrical appliances. It is approximate because there are so many different kinds of appliances. Just think how many different TVs there are.

To start with put how many hours (or fractions of hours) it is used a day in the first column. Times it by the amount of days it is used in a week. Add this to the next column. Finally, times this by 52 to get the cost for the whole year. While these hourly costs may seem small, they soon add up. The more electrical appliances you have the more the bills add up too.

Try using this to find out the running costs in your classroom for the whole year. Again combine this with other classes to work out the cost of the whole school.

English activity

This project gives plenty of ideas for persuasive writing. Write an argument for renewable power, or why it is a good idea to turn off lights and electrical appliances when you are not using them. You could hold a class debate on the value of the standby button.

Citizenship/circle time activity

As a class review, what you have learned about energy so far? Brainstorm ways in which you can reduce the amount of energy used to power things. Think about ways as a class you can reduce energy consumption in school.

It could be ways of organising classroom duties like having monitors for the lights or computers. But there are other less obvious ways such as reducing the brightness of computer monitors.

Finally create a class charter so everyone knows how to be responsible with the electrical appliances they use.

Art Activity

Create campaign posters or a display for the school reminding people to switch lights, computers and electrical appliances off and save energy. Think and use a catchy slogan such as "Last out - lights out". Remember to keep it upbeat and positive.

Use a template out of a piece of A4 card with a hole in the middle so they can be positioned around light switches or plugs.

Finally

If you are doing this as a whole school, compare your energy consumption to last year's bill. See if you can use this campaign to lower the energy across the school by 10%.