

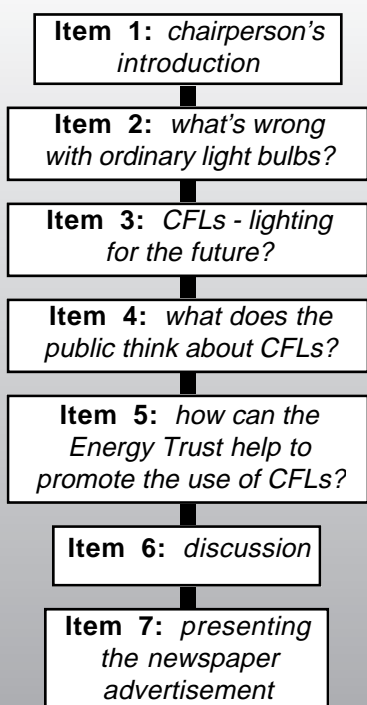
Pupil Research Brief

Teachers' Notes

Syllabus Coverage *Subject Knowledge and Understanding*

- electrical energy is readily transferred as heat (thermal energy) and light
- the amount of energy transferred from the mains is measured in kilowatt hours, called Units
- the fraction of energy supplied to an appliance which is usefully transferred is called the efficiency of the appliance
- energy transferred = power x time
(kWh) (kW) (h)
- the power of an appliance is measured in watts (W) or kilowatts (kW) (1 kW = 1000W)
- the cost of this energy can be calculated using:
total cost = No. of Units x cost per Unit

Route through the Brief



Introduction

The aim of this short Brief is for pupils to learn about Compact Fluorescent Lamps (CFLs), the energy-efficient alternative to ordinary light bulbs. The context for the Brief and the pupils' roles are based on a real-life issue.

In 1992, after the Rio Earth Summit, the government set up an organisation called the Energy Trust, to help it meet its commitment to reduce carbon dioxide emissions. The Energy Trust runs campaigns to encourage people to use energy more efficiently at home, and one of these targets the use of CFLs.

The pupils, working in groups, are invited to take the role of members of the *Energy Trust's Energy Efficient Lighting Committee*. Their task is to produce a promotional newspaper advertisement to encourage the public to switch over to CFLs. They are given briefing notes and are required to work through a committee meeting agenda, taking it in turns to give short presentations on each agenda item. As well as covering basic information about light bulbs and costing electricity, they learn about the short-comings of using ordinary filament bulbs and the benefits of CFLs. They also learn about the results of market research into why some people switch to using CFLs and why others do not.

They then go on to produce a draft of a newspaper advertisement as part of a national promotional campaign for CFLs.

Pupil Research Brief

Teachers' Notes continued

Prior knowledge

This Brief is meant to be used in the context of work on using mains electricity. It would be helpful if pupils had some idea of the concept of energy efficiency.

Pupil grouping

Pupils could work in a number of groupings during this Brief. Suggestions are :

- Initial briefing* - whole class; teacher introduces topic outlining context and pupil roles
- Committee meeting-* ideally groups of 5 with one as chairperson (groups of more or less than 5 will require pairing for an item, or one pupil being responsible for two items)
- preparation of agenda items* - individual or pairs (depending on number in each meeting group)
- presentation of agenda items* - meeting groups (as above)
- planning and discussion of newspaper advertisement* - meeting groups
- Plenary session (optional)* - whole class; reporting back by meeting groups and discussion of findings
- Written reports* - individual, if notes are to be used for assessment purposes

Timing

This Brief is likely to take about 70 minutes of classroom time.

Activities

The teacher should issue pupils with the **Study Guide** which provides pupils with a summary of what they should produce as they work through the Brief. It can also act as a checklist for pupils to monitor their own progress. Set the scene by introducing the Energy Trust and outlining pupils' roles as members of the Energy Efficient Lighting Committee who are required to produce a draft of a newspaper advertisement (80 words maximum and include an eye-catching illustration), as part of a national campaign to

promote widespread use of CFLs. They should do this by the end of the meeting (double lesson). Tell them that as committee members given the task of producing the advertisement, they will need to first make sure they have sufficient knowledge about CFLs and their benefits. Hence the need to work through the **background notes** attached to the **meeting agenda**. You do not need to tell the pupils much more at the beginning because what they have to do will become clear as they work through the agenda.

Split the class into 'committees' of five pupils ideally, although as pointed out earlier, four or six pupils will work. Either, have each group select a chairperson or do so yourself. The chairperson will be responsible for introducing the meeting, chairing the question and answer sessions, leading the discussion and the drafting of the advertisement. Give the chairperson the **agenda**, his or her **briefing notes**, and the **set of briefing notes** for the agenda items. In committee groups, before the meeting starts, pupils should be allocated an **agenda item topic** and given about 10 minutes to read through the item briefing notes and prepare their presentation for the meeting.

The pupils should now be able to work through items 2 - 5 unaided.

You may wish to bring the whole class together in a plenary session to present and discuss respective group advertisements, to reinforce key learning points and to evaluate the experience. If they produce their advertisements on an OHT it would make it easier, or alternatively, a poster display would allow pupils to move around and ask questions of other groups.

Using IT. Pupils could use word processing or DTP (desk top publishing) packages to produce their advertisement.

Scottish syllabus coverage

Standard Grade Physics - *Energy Matters*

Further research opportunities

Pupils could be asked to produce a "professional looking" advertisement using a word-processor, or even a leaflet or poster for a "school-wide" campaign or competition.

They could calculate how much money their family could save if they switched all the bulbs in their home over to CFLs.