

## C2 ACTIVITY 3: ENERGY LABELS AND APPLIANCES

### Background

In this activity students examine some aspects of selected appliances. They learn what energy labels are, how to read them, and why not all appliances carry energy labels. Students are taught to interrogate the labels and to look at all aspects of the appliance's energy use. They examine the energy conversions involved in the appliances, calculate their running costs, and consider the connection between energy efficiency and energy conservation. To help to engage students and deepen their understanding, the teacher can set them the task of drawing up simple flow charts.

### Suggested approaches:

- With the class, examine the electrical appliances used in the classroom.
  - ❓ *Do any of them have an energy label?*
  - ❓ *Which appliances carry an energy label and which ones do not?*
  - ❓ *Can the students suggest any reasons why some appliances carry labels and others do not?*
  - ❓ *Where should they look for the energy label?*
  - ❓ *Do they understand any or all of the information on the label?*
  - ❓ *Can they find the power rating of the appliance?*
  - ❓ *Do they know where to look for the power rating?*
  - ❓ *What is the use of knowing the rating?*
  - ❓ *Why do we have energy labels?*
  - ❓ *How might energy labelling contribute to energy conservation?*
- Energy labels rank the energy efficiency of an appliance from A (most efficient) to G (least efficient). Using the sheet labelled **C2.3 WORKSHEET E: DOMESTIC APPLIANCES** ask the students to guess which appliances are legally obliged to carry energy labels and the energy efficiency rating of each appliance. Remind the students to consider whether all the energy is being used solely for the purpose of the appliance, or if there is any loss via heat, sound, or light (for example a washing machine is for washing clothes but also generates noise).
- By way of involving home usage the students can select a number of appliances for inspection at home. Ask them to fill in the first two columns of **C2.3 WORKSHEET G: HOW MUCH DO YOUR HOME APPLIANCES COST?** and bring it into class. They can calculate the cost as a class exercise.
- Challenge the students to list all appliances they can think of that are legally obliged to carry an energy label. At the moment there are 14 categories of domestic appliances but the list is increasing. [SEAI's website](#) has information on energy labelling. [S.1 No. 351 of 2014 Energy Labelling](#) gives the list of households appliance categories that must be labelled.
- Arrange the students in groups of three. Assign one of the listed items from [this energy labelling list](#) to each group and set them the following task:
  - ✔ *Find two versions of the same product on the market, each with a different energy label.*
  - ✔ *Indicate what information is shown on the energy labels.*
  - ✔ *Suggest reasons why two similar products can carry different energy labels.*
- Arrange the students in small groups. Present each group with **C2.3 WORKSHEET E: DOMESTIC APPLIANCES** and assign them one appliance per group along with the following tasks:
  - ✔ *Calculate this appliance's running cost for a given period (e.g. three days, a week, for a family of four over the course of a week...).*
  - ✔ *Draw a flow diagram showing the various energy transfers which take place from the time an appliance is switched on to the time it is switched off. Highlight which energy transfers could be considered 'wasted energy'.*
  - ✔ *Present your findings to the class for discussion and debate on the issues that have been highlighted.*

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### What to do:

- Decide on a starting approach:
  - ✓ *Introducing energy labels*
  - ✓ *Introducing appliances for calculating energy consumption, then moving onto the subject of energy conversions*
  - ✓ *Introducing appliances for students to track energy transfers*

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### Resources:

- Various online appliance calculators are available. Try this one from [Sust-it](#). This could be used as a resource for helping students to appreciate the energy usage of appliances. Students could each select five appliances and find out how much it would cost to run each one over a ten-year period. They could then use this figure to work out the cost for shorter periods.
- The [Energy in Education](#) site has a number of fact-sheets and videos which aim at supporting the strategic monitoring of energy consumption and emphasising the resulting savings.

## C2.3 WORKSHEET E: DOMESTIC APPLIANCES



**OVEN**

Power rating: 927 W



**TV**

Power rating: 350 W



**BLENDER**

Power rating: 450 W



**TOASTER**

Power rating: 1150 W



**VACUUM CLEANER**

Power rating: 1700 W

## C2.3 WORKSHEET F: ENERGY LABELS

- ? On what are these labels found?
- ? Where are they located?
- ? What useful information do they contain?

Energy	Washing machine
Manufacturer Model	
More efficient	
A	
B	
C	
D	
E	
F	
G	
Less efficient	
Energy consumption kWh/cycle <small>(based on standard test results for 60°C cotton cycle) Actual energy consumption will depend on how the appliance is used</small>	<b>1.75</b>
Washing performance <small>A: higher G: lower</small>	<b>A B C D E F G</b>
Spin drying performance <small>A: higher G: lower Spin speed (rpm)</small>	<b>A B C D E F G</b> 1400
Capacity (cotton) kg	5.0
Water consumption	5.5
Noise (dB(A) re 1 pW)	Washing 5.2 Spinning 7.6
<small>Further information contained in product brochure</small>	

Energy	Washing machine
Manufacturer Model	
More efficient	
A	
B	
C	
D	
E	
F	
G	
Less efficient	
Energy consumption kWh/cycle <small>(based on standard test results for 60°C cotton cycle) Actual energy consumption will depend on how the appliance is used</small>	0.95
Washing performance <small>A: higher G: lower</small>	<b>A B C D E F G</b>
Spin drying performance <small>A: higher G: lower Spin speed (rpm)</small>	<b>A B C D E F G</b> 1400
Capacity (cotton) kg	5.0
Water consumption l	55
Noise (dB(A) re 1 pW)	Washing 5.2 Spinning 7.0
<small>Further information is continued in product brochures</small>	



## C2.3 WORKSHEET G: HOW MUCH DO YOUR HOME APPLIANCES COST?

Name: \_\_\_\_\_ Date: \_\_\_\_\_

	APPLIANCE	POWER RATING	COST TO RUN (PER HOUR)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

1. Which appliance requires the most power?

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2. Which appliance requires the least power?

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3. Can you think of ways to save electricity by using appliances more efficiently?

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