



## STANDBY POWER IN MY HOME

### Goal(s):

---

- The pupils are aware of the power consumption of electrical devices when in standby mode and switch appliances completely off when possible.
- The pupils choose devices with low standby consumption when buying electrical devices.

### General description of the activity:

---

We hear from the media and research projects that “standby power” consumes large amounts of energy and millions of € every year. Is this true? By measuring the standby power consumption of some typical household appliances, the pupils can find out.

In smaller groups, pupils analyse the energy consumption of standby and compare it with the total energy consumption of the device and the total energy consumption in the home.

### Required materials:

---

- Small simple energy loggers – i.e. devices that meters energy consumption and allow readings of even small levels.
- Various appliances.

### Required pupil skills:

---

Reading meters

### How does this activity fit into the curriculum:

---

This activity is well suited for lessons in Science, Mathematics, Design Technology and Literacy.

### Safety issues:

---

Pupils need adult supervision at all times during meter reading.



<b>Individual steps of the activity:</b>	<b>Required time:</b>
<ol style="list-style-type: none"> <li>1. Find a number of electric appliances (including charging devices) that the pupils know from their everyday lives that can be brought into the class room for investigation – for example a radio, a TV, an electric toothbrush, a computer, an electric clock and a cell phone.</li> <li>2. Contact the local energy agency or the energy provider of the school (possibly with the aid of the school caretaker) to borrow simple energy loggers. The energy agency and the energy provider can also provide useful information about the energy consumption of electric appliances in the home.</li> </ol>	Preparation – 30 minutes
<ol style="list-style-type: none"> <li>3. Present the concept of standby power consumption to the pupils and how one can observe that standby power consumption is taking place. Why do some appliances have a standby power function?</li> <li>4. The pupils are given as homework assignment to find appliances at home which have a standby power function and how long they are left on standby.</li> </ol>	1/3 lesson + homework
<ol style="list-style-type: none"> <li>5. Discuss the findings of the homework and agree on how long each of the appliances is on standby (rough average).</li> <li>6. The pupils are divided into a number of groups equal to the number of appliances brought into the classroom and each group is given an energy logger.</li> <li>7. Each group then has to measure the consumption of their appliance when on full power and when on standby.</li> <li>8. Using the agreed average time of standby let the pupils calculate the total standby power consumption of their appliance.</li> <li>9. Discuss the findings of the experiment and what can be done to avoid unnecessary standby consumption. For example: How much energy is consumed by the mobile telephone charger for charging and for standby? If you know the time it takes to charge the mobile phone then you can turn the charger off after this time.</li> </ol>	1 lesson
<ol style="list-style-type: none"> <li>10. Each pupil prepares a booklet or drawing of what they have learned about standby power consumption as a manual for their parents/families.</li> </ol>	1 lesson

**Suggestions for combination with other AL activities:**

- “Energy label detectives” – Investigation of the difference between the energy consumption of the best and worst available product in the shops
- “Race of the pots” – How to heat a pot energy efficiently. Under what conditions does the pot heat its contents fastest? How much energy is consumed?



---

“Electricity counts” – Can you save 500 Watt of electricity?

### **Variations:**

---

Consumer survey: The pupils can do a survey of people to find out if the standby consumption of a device has an influence on the choice of equipment.

Internet games: Several organisations offer internet games on how to reduce standby power in the home. Why don't you let the pupils try the 'Happy House' activity on:

[http://www.ltscotland.org.uk/climatechange/frame\\_panel/full\\_screen.htm](http://www.ltscotland.org.uk/climatechange/frame_panel/full_screen.htm)

### **Available aids:**

---

Aid 1 – Sheet for homework notes

Aid 2 – Group work results





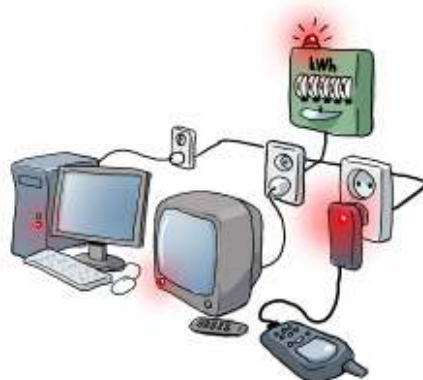
**Normal consumption**

Name of appliance	Appliance consumption (kW)	Time with appliance on (hours)	Appliance consumption (kWh)

**Standby consumption**

Name of appliance	Appliance standby consumption (kW)	Time with appliance on standby (hours)	Appliance standby consumption (kWh)

The electricity consumption of an average home is \_\_\_\_\_ kWh per year





**Search words:**

<b>Energy end-use</b>	<b>General topic</b>	<b>Educational subject</b>	<b>Age level</b>
Transport	General sustainable development	<b>Design</b>	6-8 years
Space heating & cooling	Renewable energy	<b>Technology</b>	<b>9-10 years</b>
Hot & cold water	<b>Energy efficiency (saving)</b>	<b>Mathematics</b>	<b>11-12 years</b>
Lighting	CO <sub>2</sub> wise transport	<b>Literacy</b>	
<b>Electric appliances</b>		<b>Science</b>	