

Small Appliance Energy Reliance

Energy Revealed
Grab & Go Activity
Grade Level 4-12



Main Objective

Learners will investigate the energy usage of regular, every day small appliances.

Learning Outcomes

By the end of this activity, learners will:

- Investigate and describe relationships between humans and their environments and identify related issues and scientific questions.
- Analyze personal and public decisions that involve consideration of environmental impacts and identify needs for scientific knowledge that can inform those decisions.

Length of Activity: 2 – 3 hours

Step 1: Discuss about small appliances

Step 2: Determine the amount of energy use

Materials Required

- Installed energy metering technology or plug in energy meter
- Decided upon small appliances
- Copies of Small Appliance Energy Reliance Handout (optional if you have energy metering technology)

Activity

Step 1: The Small Appliance Discussion

- Ask learners what types of small appliances they/their guardians use every day. Ask them to write down their ideas using the handout.
 - **Note:** If you are using the energy metering technology you may opt just to use a piece of paper for this step instead of the handout since software can record the results. Tell them it is not limited to 10 appliances if they think of more. Examples may include a coffee maker, kettle, microwave, toaster, oven, vacuum, etc.
- As a class predict what appliances will be the most energy efficient. Which appliance do you think will use the most energy in a day or a week? Have a friendly competition about this! You can use the worksheet and have the learners rank the appliances they think will use the most energy and identify that ranking on the handout.
- Work as a team to coordinate bringing in as many small appliances from home into the school. You may find most of the appliances the learners are interested in, in your staff room or around the school.
 - **Note:** Please account for any Health and Safety Regulations when doing this!

Step 2: The Small Appliance Energy Test


- Arrange the small appliances in order of what the class thinks will use the most watts.
- If you are using circuit level energy metering technology, make sure your software is loaded and you have identified the electrical outlet the appliance should go into to get an accurate reading.
 - **Note:** Make sure the scale is set correctly to see the energy use is appropriate to see the spike in energy use!
- Plug in the first appliance and record how much energy each appliance uses.
- Use GreenLearning's Energy Calculator for your province to find out how many kilowatt hours are used in a year, the cost of electricity in one year and the kilograms of GHG's produced in one year.

 [GreenLearning's Electrical Energy Calculator](#)

- Go through each appliance and record the data used by each one.
- How do the class predictions compare to the results shown? Discuss why they are or are not the same.

Extension Activities

- Arrange to have different variations of the same type of appliance and try this learning activity. For example, how do coffee pots differ? Is there a difference between single use coffee makers (Tassimo, Keurig) vs coffee makers that brew a pot of coffee? Have learners calculate the cost per cup for fair comparison.
- Investigate what makes some appliances more energy efficient than others. For example, how is a new fridge more energy efficient and why. Research energy efficient standards for those such as:

 [Energide](#) and [ENERGY STAR®](#)

- Focus on a morning routine by asking learners how many things require electricity for their morning routine. This can include electric razors, curling irons, hair dryers, coffee makers, toaster, microwave, kettle, etc.
- For senior learners: Research sources of emission factors and test how applying one or another impacts the calculation, how electricity emission factors vary around the world and why (different fuels in their grid's generation mix). Why might the same appliance have a different life cycle carbon footprint (transportation to market, different grid, etc)? Background information on emission factors can be found here:

 [Basic Information of Air Emissions Factors and Quantification](#)