



STUDENT WORKSHEET

Home Appliance Energy Audit

A 30-minute numeracy and energy-literacy activity. Use appliance labels, the open dataset, or measured watts to estimate annual electricity use and cost.

Name: _____

Date: _____

$$\text{Annual kWh} = \text{watts} / 1,000 \times \text{hours used per day} \times 365$$
$$\text{Annual cost} = \text{annual kWh} \times \text{your electricity rate}$$

Instructions

1. Choose five household appliances from the HowMuchWatts chart or your home/classroom.
2. Record the rated or measured watts and estimate average hours used per day.
3. Calculate annual kWh and cost with your local electricity rate.
4. Compare your answer with the free calculator, then identify one assumption to verify.

Appliance	Watts	Hours/day	Annual kWh	Annual cost

Reflection

1. Which appliance has the highest estimated annual cost, and what causes that result?

2. Which input would you verify first with a label or power meter? Why?

3. Describe one realistic change that could lower energy use without removing the appliance.

Free resources: [38-appliance dataset and chart](#) | [running-cost calculator](#) | [classroom embed](#)



Teacher guide: Home appliance energy audit

Suggested for ages 11+ and adaptable for numeracy, science, environmental education, home economics, or sustainability. No signup is required.

Learning goals

Students will distinguish power (watts) from energy (kilowatt-hours); calculate annual energy use and cost; explain why nameplate values and schedules can differ from a real bill; and identify one evidence-based energy-saving action.

Suggested 30-minute lesson

Time	Activity
0-5 min	Introduce watts, kWh, and the formulas. Ask which appliances students expect to cost the most.
5-15 min	Choose five appliances, record watts and hours/day, then calculate annual kWh and cost.
15-22 min	Check results with the calculator. Compare groups and discuss different usage assumptions.
22-30 min	Complete the reflection prompts and share one saving action plus one limitation.

Worked example

$$\begin{aligned} 50 \text{ W fan} / 1,000 \times 8 \text{ hours/day} \times 365 &= 146 \text{ kWh/year} \\ 146 \text{ kWh} \times \$0.17/\text{kWh} &= \$24.82/\text{year} \end{aligned}$$

The arithmetic is exact for the inputs, but the result is still an estimate. Power can change by speed, daily use varies, and a plug-in meter can test the real draw of a compatible appliance.

Discussion and assessment prompts

1. Why can a high-wattage appliance still have a low annual cost?
2. Which matters more for the chosen appliance: watts or hours of use?
3. Which devices cycle instead of drawing rated power continuously?
4. What evidence would make the estimate more reliable?

Resources, reuse, and limitations

Download the [CC BY 4.0 appliance CSV](#), use the [free calculator](#), or copy the [no-signup embed code](#). Typical watts and daily use are starting points. Results exclude fixed charges, taxes, demand charges, and time-of-use pricing unless separately added.

Teach, adapt, and republish under CC BY 4.0. Suggested attribution: Home Appliance Energy Audit by HowMuchWatts, howmuchwatts.com/appliance-power-consumption/.