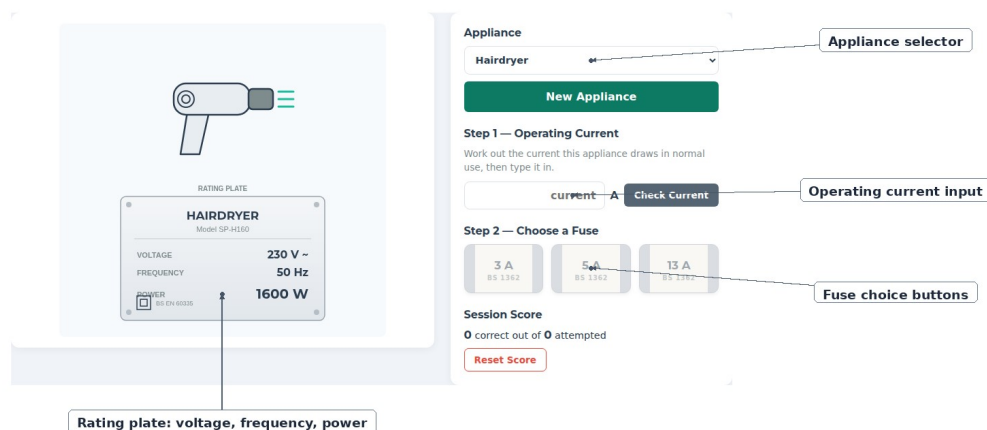


Fuse Selection Lab

Rating Plates, Operating Current and Choosing a Fuse

Aim:

You are investigating how the power and voltage on an appliance's rating plate determine the fuse needed to protect it.



Prediction:

For a high-power appliance such as a kettle, do you predict it will need a bigger or a smaller fuse rating than a low-power appliance such as a phone charger? Give a reason.

.....

Test your prediction using the sim.

Method:

1. Choose an appliance from the Appliance selector, or click New Appliance for a random one, and read the Voltage, Frequency and Power on its rating plate.
2. Work out the operating current using **current (A) = power (W) ÷ voltage (V)**, type your answer into the current box and click Check Current.
3. Once your current is accepted, decide which of the three fuse ratings — 3 A, 5 A or 13 A — you think protects this appliance.
4. Click that fuse rating and read the feedback message. Record the appliance, its power, your calculated current and the fuse rating you chose in your results table.
5. Click New Appliance and repeat for at least five more appliances, including the lowest-power and the highest-power appliance you can find.
6. For one further appliance, work out and accept its current as before, but do not click the correct fuse yet. Click a fuse rating that is smaller than the operating current and read the feedback, then click one that is larger than the correct rating and read the feedback. Finally click the correct fuse.

Results:

Appliance	Power (W)	Voltage (V)	Current I (A)	Fuse chosen (A)	Correct? (Y/N)

Analysis:

Look down your table. How does the correct fuse rating relate to the size of the operating current?

.....

.....

.....

In step 6, what feedback did you get when you chose a fuse rated too small? What did you get when you chose one rated too large?

.....

.....

.....

Explaining why:

A fuse rated too small for an appliance blows even during normal use. Why is this a nuisance rather than a safety risk?

A fuse rated too large never blows during normal use, yet it is genuinely dangerous. Explain why, thinking about what a fuse is meant to do if a fault causes a very large current to flow.

Use your answers above to explain, in general terms, why the fuse rating chosen for an appliance must be just above its normal operating current — not far above it, and not below it.
