



Academic Activity
Chapter 8

Survey of Power Usage Using Ohm's Law

In our homes we have many different electronic devices and appliances. When in use these electronics draw power. Power is the amount of potential or voltage, multiplied by flow or amount of current it takes to do the electrical work needed, over an amount of time. It is measured in watts.

The equation for calculating electrical power is:

Power = Voltage x current or $P=VI$ and the units are watts, represented by uppercase W

Survey the power usage of ten electronic devices and appliances in your home. Record your results and compare energy usage. Most electronics and appliances list their amperage, voltage drawn, or the number of watts they use. This can often be found on the back or bottom of the device, or on the adapter. Fill in the table with the information you find, and calculate the portions that are missing using the formula $P = VI$. If you have the power in watts, you will need to use the equation to solve for the amperage.

Some things to keep in mind about voltage:

- American homes have 120V of electricity at the outlet.
- Larger appliances like electric stoves, dryers, and central air units use 240V (two 120V lines).
- Chargers or smaller electronics (like game systems) plug into the wall but may step the voltage down. Use the voltage on the label.

Appliance/Electronic Device	Voltage (V)	Amperage (I)	Power in Watts (P)	Amount of Time Used in a Day (hours)

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1. What device used the most power and how much power was it?

2. What device is on the longest everyday?

3. What device requires the most amperage and what was that amperage?

4. Household circuits in the United States usually carry 20 amps of current. Add the amperage of all of the appliances together and write it down _____. What would happen if they were all plugged into one circuit?

5. How many circuits would it take to accommodate all of the appliances?
