Should I Unplug?

**In-Class Activity:**

1. Use a wattage meter to measure and record plug loads (the energy used by the product while powered by means of an ordinary AC plug) of various appliances and electronic devices that students commonly use: cell phones and chargers, laptops and chargers, iPods/MP3 players and chargers (collect data on both the chargers alone and the device when plugged in), hairdryers, irons, coffeemakers, printers, mini-refrigerators, microwaves, televisions, etc.
2. Compute the cost of electricity required to run a laptop for 24 hours.

**Questions for student exploration:**

1. Plug loads in student rooms: There are a wide variety of electronic devices and small appliances that are a regular part of students’ lives. If such a product remains plugged in to an outlet while not in use, there is still a small amount of energy that the device uses.
	1. Estimate the daily total plug load for appliances and devices that students regularly leave plugged in while not in use. Use the measurements from the in-class activity; if you think of a device we did not measure, use a measurement you find on the internet.
	2. If living in an apartment, how much money could an individual student save each month by eliminating these plug loads? Each year?
	3. If living in a dormitory, how much money could one student in an individual dorm room save the university each month? Each year?
	4. Estimate the monthly and yearly savings to the university if all students in an individual dorm eliminated these plug loads.
	5. What are some broader implications of eliminating these plug loads?
	6. Explore any other questions you may think of.
2. Cell phones: Each cell phone takes a specific amount of time to charge. Leaving the phone plugged in to an outlet after it is fully charged is a plug load that could be eliminated. Estimate how much money could you save each year by eliminating this plug load.

**Present results in a class presentation.**

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Sample Calculation Translating Wattage to a Dollar Figure

Assumptions:

* The wattage of a laptop is 50 watts
* The price of electricity is 12 cents per kWh (kilowatt hour)

Other information:

* A watt is the unit of electric power; it measures the rate of energy conversion or transfer
* There are 1000 watts in one kilowatt
* A kilowatt hour is a unit of energy equivalent to one kilowatt of power expended for one hour of time

The cost of electricity necessary to run a laptop for 24 hours under the above assumptions is:

$$\left(\frac{50 watts}{1}\right)×\left(\frac{24 hours}{1}\right)×\left(\frac{1 kilowatt}{1000 watts}\right)×\left(\frac{12 cents}{kilowatt hour}\right)=14.4 cents$$