Power

Part 1: Concepts:

1. Take a sampling of a few of the objects that are used on a daily basis and complete the chart given below:

Device	Voltage	Current	Power	Hours used per day	Cost per day	Cost per Month

Part 2: Practice Problems:

2. A basement light has a power of 75 W. How much money does it cost to run the light bulb for a year if you have it on for 10 minutes a day. What is the current drawn by the bulb?

3. Dancing Santa draws a current of 150 mA. What is Santa's power and how much does it cost to run him for 1 hour a day for the 12 days leading up to x-Mas?

Part 3: Independent Problems:

4. A vacuum cleaner draws 11 A from a home outlet. How much energy is used in the 10 minutes it takes to clean the living room?

5. Four "AA" batteries are used in a small toy race car to get the 225 gram car to go from rest to 5 m/s in a time of 8 seconds. What is the minimum amount of current that had to be coming from the batteries during this acceleration?

6. Target sells a device that hooks into the cigarette lighter of your car to warm up coffee, tea or hot chocolate. Assuming that the device can raise the temperature of 250 mL of hot chocolate from 10°C to 40°C in 5 minutes, what is the current that is being pulled from the car battery during this process?

7. Ray-O-Vac "15-Minute 2,000mAh I-C^3 AA Rechargeable NiMH Batteries, 4/Pack" costs $19.63. They claim that they will charge 500x before having to be replaced. Energizer sells one time use "AA" batteries that cost $2.99/4 pack. Assuming that you can charge these batteries 500x without losing them, how much money will you save using these rechargeables rather than the 1 time use batteries?

8. Below are two different lamps that look similar but take two different types of bulbs. Assuming these lamps will be used for ten years for 6 hours a day, calculate the total cost of the lamp.

	Lamp 1	Lamp 2
Picture		
Initial Cost	$22.00	$99.00
Bulb	300 W Halogen Bulb (included with lamp) 1500 hour life ($5.97)	27 W Fluorescent Bulb (not included) 10,000 hour life ($12.62)