



Engineering Merit Badge

Day Three Homework: Energy Hogs (6b)

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Instructions

1. Review the attached list of common household appliances and pick the 10 that you think use the most electricity

#	Appliance with most electricity usage per year	Annual Energy Cost (see answer key tomorrow)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
Total (do tomorrow):		

2. List five ways you can conserve energy to become less of an energy hog

1	
2	
3	
4	
5	

To get credit for this requirement, you must email Mr. Eric this completed sheet.

Merit Badge Counselor: Eric Cutright, Troop 1028/1029, Charlottesville, VA – visit us at www.troop1028.org



Engineering Merit Badge, Day 3 Homework: Energy Hogs (6b)

List of Common Appliances – Pick the 10 biggest hogs

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	Power Draw (W) (1)			Annual Usage (hours per year)			Annual Consumption, kWh/year	Annual Cost, \$
	Active	Idle	Off	Active	Idle	Off		
Kitchen								
Coffee Maker								
Dishwasher (3)								
Microwave Oven								
Toaster Oven								
Refrigerator-Freezer								
Freezer								
Lighting								
18-W Compact Fluorescent								
60-W Incandescent Lamp								
100-W Incandescent Lamp								
Torchiere Lamp-Halogen								
Bedroom and Bathroom								
Hair Dryer								
Waterbed Heater								
Laundry Room								
Clothes Dryer								
Clothes Washer (3)								
Home Electronics								
Desktop PCs								
Notebook PCs								
Desktop Computer Monitors								
Stereo Systems								
Televisions								
Analog, <40"								
Analog, >40"								
Digital, ED/HD TV, <40"								
Digital, ED/HD TV, >40"								
Set-top Boxes								
DVD/VCR								
Video Game Systems								
Heating and Cooling								
Dehumidifier								
Furnace Fan								
Ceiling Fan (only fan motor)								
Space Heater								
Water Heating								
Water Heater-Family of 4								
Portable Spa								
Miscellaneous								
Rechargeable Power Tool								
Vacuum								
Pool Pump								
Well Pump								
Lawn Sprinkler								
Aquarium Equipment								



Engineering Merit Badge, Day 3 Homework: Energy Hogs (6b) Energy usage for Common Appliances –

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NOTES and SOURCES

NOTES:

- 1) Power draw will vary due to appliance components and modes of operation.
- 2) \$0.096/kWh.
- 3) Excludes electricity for water heating and drying.
- 4) Cycles/year.
- 5) TVs <40" are estimated on 3 hours/day and TVs >40" are estimated on 5 hours/day.
- 6) Gallons/day.
- 7) Power, usage and annual consumption values for televisions are weighted averages of multiple usage types and screen sizes.

SOURCES:

BTS/A.D. Little, Electricity Consumption by Small End Uses in Residential Buildings, Aug. 1998, Exhibit 6-8, p. 6-10 for clothes washer, computer, dehumidifier, dishwasher, furnace fan, pool pump, torchiere lamp-halogen, waterbed heater, and well pump; LBNL, Energy Data Sourcebook for the U.S. Residential Sector, LBNL-40297, Sept. 1997, p. 100-102 for clothes dryers, Table 10.2, p. 108 for lighting, and p. 62-67 for water heaters; LBNL, Miscellaneous Electricity Use in the U.S. Residential Sector, LBNL-40295, Apr. 1998, Appendix D for hair dryers; EIA, Supplement to AEO 2008, June 2008, Table 21 for refrigerator and freezer; GAMA, Consumers' Directory of Certified Efficiency Ratings for Heating and Water Heating Equipment, Apr. 2000 for water heater power draw; EIA/TIAX, Commercial and Residential Sector Miscellaneous Electricity Consumption: FY2005 and Projections to 2030, Sept. 2006, p. 41-60 for coffee maker, microwave oven, stereo systems, TVs, DVD/VCR, ceiling fan, and portable spa; TIAX, Energy Consumption by Consumer Electronics in U.S. Residences, Final Report to the Consumer Electronics Association, Jan. 2007, p. 69-72 for desktop and notebook PCs, p. 62-63 for monitors, p. 85-90 for TVs, p. 76-81 for set-top boxes, and p. 103-105 for video game systems; and Energy Center of Wisconsin, Electricity Savings Opportunities for Home Electronics and Other Plug-In Devices in Minnesota Homes, May 2010, pp. 52-57 for toaster ovens, space heaters, power tools, vacuums, lawn sprinklers, and aquarium equipment.