

Electrical Appliances



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Do you need an idea for a scientific study?

Try out one of our ideas or make one of your own.

Start learning right now about the impact of electrical appliance use on the environment. Take the following brief quiz to see how much you already know about electrical appliances. See the bottom of page 4 to check your answers.

1. Electrical appliances can pull current even when they are turned off, costing you money.
 - a. true
 - b. false
2. If you switched five light bulbs in your room from 100-watt to 40-watt bulbs, how many kWh would you save over a year (assuming the lights are on 10 hours a day)?
 - a. 730 kWh
 - b. 1095 kWh
 - c. 1245 kWh
 - d. 1825 kWh
3. When did the Environmental Protection Agency and Department of Energy start the Energy Star standard for energy efficiency?
 - a. 1992
 - b. 1998
 - c. 2004
 - d. 2010
4. What percentage of energy must a television save in comparison to the federal standard in order to get an Energy Star rating?
 - a. 10
 - b. 20
 - c. 30
 - d. 40
5. What percentage of energy must a dishwasher save in comparison to the federal standard in order to get an Energy Star rating?
 - a. 10
 - b. 20
 - c. 30
 - d. 40



Home Economics: How Much Does Electricity Cost?

Start saving your lawn mowing and babysitting money because you are about to find out how much the electricity costs for just a few of your favorite activities.

Questionnaire

A. How many hours a week do you watch television? _____

B. How many hours a week do you use your computer? _____

C. How many hours a week do you leave the light on in your room (to read, hang out with friends, etc.)? _____



Procedure

1. To calculate how much watching TV costs you per year, multiply $0.18 \text{ kW} \times \text{A.} _____ \text{ (hours you watch per week)} \times 52 \text{ (weeks in a year)} \times \0.20 (per kWh)

\$ _____

2. To calculate how much using your computer costs you per year, multiply $0.275 \text{ kW} \times \text{B.} _____ \text{ (hours used per week)} \times 52 \text{ (weeks in a year)} \times \0.20 (per kWh)

\$ _____

3. To calculate how much using your bedroom light costs you per year, multiply $0.3 \text{ kW} \times \text{C.} _____ \text{ (hours used per week)} \times 52 \text{ (weeks in a year)} \times \0.20 (per kWh)

\$ _____

4. Add up the total costs from each of the three above.

\$ _____

Follow-up Questions

5. How much money could you save if you switched out your regular light bulbs for compact fluorescent (CFL) bulbs, reducing the amount from 0.3 kW to 0.12 kW ?

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The Hidden Little Costs: A Cautionary Tale for Small Appliances

If you are not paying for your own electricity, you may take it for granted that electricity is always available via electrical outlets. The reality is that electricity costs money, but we usually do not think about how much. “Vampire” appliances cost you money by drawing electricity when they are plugged in, even if they are turned off. Most electric companies charge users by a kWh rate. A kilowatt is 1000 watts, which are units of power equal to one joule per second. Each appliance pulls a certain amount of watts: an electric toothbrush may only require 0.243 kWh for an entire year, while a refrigerator can require 5.7 kWh per day. The amount of kilowatt-hours required does not just vary from one type of appliance to another, but within the group as well. This is because some designs of appliances are more energy efficient than others.



Energy efficiency is the primary goal of Energy Star. The Energy Star standard is the epitome of green engineering. It was started by the United States Environmental Protection Agency and the Department of Energy as a way to show people how they could save money and the environment by reducing the amount of energy required, therefore also reducing greenhouse gases. The Energy Star program labels many appliances from computers to refrigerators to light bulbs. In order to be considered an Energy Star appliance, it must be a certain percentage more energy efficient in its category than the federal standard.

Your house and your school are filled with appliances that require electricity. How many can you find plugged into outlets? How many power strips and extension cords can you see? Which do you think requires more electricity, an electric pencil sharpener on your teacher’s desk that’s always plugged in or a computer monitor that’s turned off every day? What about a big-screen TV watched for several hours or a dishwasher run three times a week? These are all questions you can start asking to be more aware of the hidden costs of electricity.

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Answers: Page 2 Answers: 1) a. 2) b. 3) a. 4) c. 5) d. Page 3 Answers: 1) Answers will vary, should be 1.872 * number of hours 2) Answers will vary, should be 2.86 * number of hours 3) Answers will vary, should be 3.12 * number of hours. 5) You would save \$1.87 per hour.

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