Text Comprehension and Analysis

Family Portraits

Hydro Québec

Family Portraits

Activity summary

Power consumption varies from household to household. The amount of electricity used depends on a multitude of factors, including the number of occupants, the type of property, insulation and lifestyle. It might seem self-evident that a large family living in a big house with a heated pool would use more electricity than a small family. But is that always the case?

Duration

50 minutes

Cycle-specific competencies

Cycle 2 – Financial Education Financial issue – Consuming goods and services
1. Consumption
a. Indicates factors that influence consumer choices (e.g., age, gender, income) b. Indicates some of the reasons why consumer habits may change (e.g., socioeconomic context, new technologies, peer pressure, personal values) e. Names fixed expenses and variable expenses (e.g., housing and insurance, food and recreational activities) i. Indicates the elements to be considered in drawing up a budget: income, expenses

Objectives

- Help students understand the breakdown of a household's energy costs
- Familiarize students with electricity bills
- Encourage students to think about their energy consumption and how to use energy more responsibly, and to discuss these questions in groups

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Preparation

Help students think about electricity and its costs by asking the following questions:

Have you ever looked at the electricity bill that your parents receive at home?

Do you know the monthly amount?

Can you tell me which electrical appliances and devices use the most energy?

Materials

Hydro-Québec's calculator:
www.hydroquebec.com/residential/customer-space/electricity-use/tools/
To print: Student's Guide

Introduction

Determining a household's electricity consumption is not as easy as you might think. Several factors such as the number of occupants, their ages, their lifestyle and the type of property come into play. You would probably guess that a large home uses more energy than a small apartment, but that's not always the case.

Instructions

- Ask students to read the three scenarios in their guide.
- Tell students to underline all the factors (devices and appliances, lifestyles or behaviors) that can affect a family's electricity use.
- Instruct students to fill out the table that goes with each scenario, listing the relevant factors in the first column and the consumption (in kilowatthours) in the second column, using the Hydro-Québec calculator.
- Ask students to estimate the annual electricity consumption in kilowatthours for each scenario.

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Follow-up

Once the students have filled out all three tables, review their results and check whether they match the answers found in the appendix. There may be a few differences due to the variables selected, but the overall results should be similar.

Reserve the last 15 minutes to discuss the student's initial perceptions about how their family, neighbors or acquaintances use electricity.

Encourage discussion by asking questions:

- Were you surprised by how much energy the households in the three scenarios use?
- What steps can a family, a couple or roommates take in the short term to use less electricity?
- What significant but cost-effective investments can a household make to reduce its electricity costs?
- When you rent an apartment, you will have to pay the electricity bill. When you choose your apartment, what factors will you consider to use less electricity?
- Do you feel equipped to use energy responsibly when you have an apartment of your own?
- In the meantime, ask your parents if you can look at your household's current electricity bill and see how you could help your family use less energy. Set a goal and take the necessary steps to achieve it.

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Answer Sheet

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Scenario 1

A retired couple aged 63 and 65 lives in Montréal in a large two-story single-family home with a finished basement. The house has 3,600 square feet of living space, excluding the basement. It has 10 rooms, including one full bathroom and one powder room.

The couple had the house built 40 years ago and has maintained it well. The windows were changed three years ago. The insulation was redone seven years ago, and the roof, eight years ago.

Heating is provided by electric baseboard heaters in each room; they alone consume 28,154 kWh of energy. In the summer, the house is cooled by a **15,000-BTU wall-mounted air conditioner**. **Installed in 2015**, it runs continuously from mid-June to late August. It allows the couple to live comfortably, since they use the stove every day.

The couple also has a small spa, which they use once (1) a week, only in the summer. They take advantage of it a little, but they prefer to stay inside, trying new recipes and watching the news 24/7.

Both retirees take **7-minute showers, in turn, every day**. They don't take baths. **They have installed Hydro-Québec's kit of water- and energy-saving products.**

The couple doesn't spend much on making sure their home is trendy. They prefer to repair or replace anything that breaks rather than trying to keep up with the latest fashions. Their major appliances are old. Every week, **the couple runs the dishwasher twice (2) and does 4 full laundry loads**, using a top-loading washer and dryer. **The refrigerator is still in good shape, but it's over 12 years old and has a top freezer. The two (2) LCD televisions, measuring 40 and 52 inches, are over 10 years old.**

Family income (net): $70,000 a year.

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Table/Scenario 1

APPLIANCE AND USE	KWH/YEAR
Electric heating: winter	28,154 kWh
Air conditioner – 15,000 BTUs: mid-June to late August	2,520 kWh
Stove: every day	759 kWh
Spa	2,093 kWh
Two television sets: about 24 W each	1,004 kWh
Two showers: seven minutes every day, using water- and energy-saving products	748 kWh
Refrigerator with top freezer	445 kWh
Dishwasher	156 kWh
Top-loading dishwasher: 200 times	176 kWh
Dryer: 200 times	440 kWh
TOTAL	**36,495 kWh**

Results may vary from student to student. The most important thing is for students to show their work then calculating the total.

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Scenario 2

A couple with two children (6 and 11 years old) lives in Val-d'Or in a one-story single-family home with 1,800 square feet of living space and no basement. There are seven rooms, including a full bathroom, and a garage (partially heated). The house has **an electric central heating system with ducts in every room. Heating needs alone eat up 21,145 kWh of energy.**

Built 25 years ago, the house has seen little upkeep over the years. Only the roof has been redone, four years ago. However, the rooms are redecorated regularly. **The home appliances were all changed over the last 5 years, except for the refrigerator in the garage, which is 14 years old. All the refrigerators have a top freezer.**

In the summer, 2 window-mounted air conditioners purchased in 2012—a 12,000-BTU model and a 6,000-BTU model—are installed in the 2 bedrooms. **They run roughly 10 hours a day for 60 days.**

The 18-ft. above-ground pool is equipped with an electric water heater that operates from mid-May to mid-September to keep the water at a comfortable temperature. Even though the family has a solar pool cover, they rarely use it because they don't like putting it on and taking it off.

The family members take **4 showers a day, each 10 minutes long**. They use a **low-flow showerhead. They run the dishwasher 5 times a week**. With four members, the family does an average of **7 loads of laundry a week**. They wash their clothes in warm water using a front-loading machine. They also use **the dryer twice (2) a week**.

Family income (net): $80,000 a year

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Table/Scenario 2

APPLIANCE AND USE	KWH/YEAR
Electric heating	21,145 kWh
Refrigerator 1, with top freezer	372 kWh
Refrigerator 2 (garage), with top freezer	458 kWh
Dishwasher: 250 days	390 kWh
Clothes washer: 350 times	116 kWh
Dryer	150 kWh
Two air conditioners: 10 hours a day, 60-day period	1,027 kWh
18-ft. above-ground pool and electric water heater: 120 days	3,112 kWh
Four showers: 10 minutes every day, using a low-flow showerhead	2,865 kWh
TOTAL	**29,635 kWh**

Results may vary from student to student. The most important thing is for students to show their work then calculating the total.

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Scenario 3

In the city of Québec, five students (18 to 20 years old) share a four-bedroom apartment on the second floor of a three-story building. The apartment has 1,500 square feet of living space. **They use 2,889 kWh of electricity a year to heat it.**

The building was constructed nine years ago using standard materials that are up to code. **The 60-gallon water heater** is installed in a closet.

The kitchen is minuscule, but the roommates cook in it only once (1) every 5 days or so. The rest of the time, they eat at the school's cafeteria or a restaurant because they don't like doing dishes. They don't have a dishwasher.

The refrigerator with bottom freezer is 5 years old, while the stove is 13 years old. Both appliances were purchased used. They do their laundry at their parents' homes.

The apartment has baseboard heaters in each room. **Old 6,000-BTU window-mounted air conditioners are installed in 3 of the rooms and run day and night all summer long (a 90-day period).**

Three of the occupants like to take bubble baths. The 2 others take 20-minute showers every day, using a standard showerhead because they don't want to waste **100 litres of water for a bath** like their roommates do. They follow a set bathroom schedule because they sometimes run out of hot water. They dry their hair and get ready in their bedroom. **They share the same blow dryer and both use it every day for a total of 15 minutes.**

Household income (net): $50,000 a year, plus loans and bursaries

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Table/Scenario 3

APPLIANCE AND USE	KWH/YEAR
Electric heating	2,889 kWh
Refrigerator with bottom freezer	542 kWh
Stove: every five days (75 times)	152 kWh
Three air conditioners: 24/7 for 90 days	3,888 kWh
Three baths: every day	3,306 kWh
Two showers: every day	3,570 kWh
Blow dryer: every day – 5 x 15 minutes x 365	685 kWh
TOTAL	**15,032 kWh**

Results may vary from student to student. The most important thing is for students to show their work then calculating the total.

Direction – Programmes commerciaux,
expertise énergétique et affaires réglementaires

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This is a translation of the original French text.
Ce document est également diffusé en français

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