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# Energy Bill, Part 1: The Cost of Energy

## Instructor's Guide and Answer Key

### Objectives:

- Students will understand what is posted on typical energy bills.
- Students will understand the cost of the energy they consume.
- Students will consider patterns of their energy use.

### The Main Thing:

In **What's In An Energy Bill? — Part 1** your students will probably get their first-ever, thorough look at two imaginary but typical energy bills. One is a bill from the winter season, and one is from the summer season. Your students will become acquainted with and use features present on energy bills, and see how much money needs to be paid. Students will be asked to consider some of their energy use patterns weekly and seasonally. A valuable exercise in itself, this lesson is specifically intended to prepare your class for **What's In An Energy Bill? — Part 2**. **Part 2** takes students well beyond energy costs to a review of the resources and air emissions consequences of their energy bill. Together, these two lessons do a great job of setting the stage for all other energy related lessons and activities that follow.

### Activity and Teacher Notes:

First time teachers of this lesson should perform this lesson as students before using it. In this way, new teachers can thoroughly acquaint themselves with the lesson content, dynamics, and timing.

The teacher of this lesson will have to decide on an individual or group approach to its completion. If a group approach is chosen, it is still expected that each student will individually complete the written exercises.

You will need to produce copies of the required energy bills in advance for your students to use in completing this lesson. Copies of these bills are available here and through the SolarWise website. Emphasize that the energy bills students will use are typical for residential energy users in this area—just like them.

**Lesson Summary Questions** may be completed in class or as homework. Accuracy of student math work and objective answers should be checked. Discussion of student answers to the **Lesson Summary Questions** is naturally fertile. Consider taking advantage of this discussion to reinforce and extend other energy use concepts.

### **Instructor's Answer Key (to the Lesson Summary Questions):**

**1a.** What are likely reasons why this family used more electricity in the summer than in the winter?

**\* Most likely reason: space cooling (air conditioning) use in the summer. Air conditioners use electricity.**

**1b.** What are likely reasons why this family used more natural gas in the winter than in the summer?

**\* Most likely reason: space heating (furnace or boiler) use in the winter. Furnaces and boilers often use natural gas as their fuel.**

**2a.** Consider the days of the week and how your family uses energy at home. Which day (or days) of the week do you think your family uses the most energy? Explain the thinking behind your answer fully.

**\* There are many possible answers to this question. Many students will answer that they use the most energy on a weekend day. On the weekend, more people may be home. Chores like laundry and vacuuming are often done. Everyone may be more likely to share a home cooked meal.**

**2b.** Which day (or days) of the week do you think your family uses the least energy at home? Explain the thinking behind your answer fully.

**\* There are many possible answers to this question. Many students will answer they use the least energy on a weekday when few people are home during the day.**

**3.** You should know that electricity is not a primary energy resource. Electricity is produced through the use of natural resource fuels. Name at least three natural resource fuels that are commonly used to produce electricity.

**There are many possible answers for these questions. Answers given will depend upon student knowledge and willingness to perform research.**

**3-1. \* Answer**

**3-2. \* Answer**

**3-3. \* Answer**

4. Consider your answers to the last question. Name at least one waste gas that is commonly released to the air in the production of electricity.

**Answer given will depend upon student knowledge or research.**

**\* Answer**

5. Describe the most important idea, concept, principle, or fact you learned while completing this lesson. Explain why your idea, concept, principle, or fact is important for you (and probably other people) to know and understand.

**This is a reflection question and your students probably have little background knowledge in this area to draw upon. No two student answers should be the same.**

**\* Answer**