

Personal Energy Audit: Revisiting Your Use

In this activity your students will:

1. Reexamine their energy use habits.
2. Review their high-energy consumption activities.
3. Compare their current energy use to their energy use at the beginning of the unit.
4. Identify energy consumption habits they have changed.
5. Reflect on new energy consumption practices and provide reasons for behavioral changes.

Let's analyze your current energy use!



Step 1: Instruct students to open their Energy Audit Spreadsheet.

Remember it was saved previously in the energy unit as **Audit_intials.numbers** or **Audit_intials.xls**
 For example, if your students name is Bruce Wayne, he saved your file as **Audit_BW.numbers** or **Audit_BW.xls**

- a. As your students work on their audit, remind them to resave their files several times.



Step 2: Complete the Energy Audit 2 Spreadsheet

Students will be working on the sheet labeled **Audit 2** for this activity.

Numbers version:

PERSONAL ENERGY AUDIT 2	Hours Used	Repeated Use	Typical Wattage (energy per unit second)	kW'h/ye
NOTES:	How many hours do you do following things? If appliance is on all the time list 24 hours/day.	List number of appliances.	These values were found using a variety of web pages and appliance manuals.	for daily use 365. For weekly use 52 (number of weeks used)
Everyday Activities	Hours used DAILY	# of appliances being used	Typical Wattage (energy per unit second)	kW'h/yea

Excel version:

12	the <i>laptop</i> computer	
13	Listen to radio	
14	Total Entertainment	
15		
16	Communications	



NOTE: Several spreadsheet columns are hidden to provide a less complicated view for your students. Columns hidden include: kW*h/day or week, Joules/ day or week, BTU/Day or week, BTU/year. If you choose to reveal these columns please complete the following steps.

Excel directions:


- Unprotect the workbook. Tools>Protection>Unprotect Workbook.
- Unprotect the sheet you wish to modify. Tools>Protection>Unprotect Sheet.
- Highlight entire columns **D** through **I** on the spreadsheet.
On a Macintosh computer – control-click and select **Unhide**.
On a PC computer – Right-click and select **Unhide**.

Numbers directions:

- Select entire column across top by clicking and dragging the pointer across from column D to I. Press control click and select unhide all columns.

1. Ask students to think about how they now use electricity.
2. Review how to enter data in the Energy Audit spreadsheet.
 - a. The spreadsheet lists common activities in **Column A** that use energy. Students will provide their **energy use** information in **Columns B and C**.
 - b. Look at **Column B (Hours Used)**. Students will enter the **number of hours** they engage in the specific activities that are listed in Column A.
 - c. Look at **Column C (Repeated Use)**. Instruct students to think about how many “appliances” they run at a time.
 - d. If a student’s household does not do a particular energy activity, they should enter **0** in both **Columns B and C**.
 - e.  **Energy Vampire Alert:** REMEMBER: Some appliances or chargers use energy when they are not actively charging or are in stand-by mode waiting to be activated by a remote or sensor. Please think about your current habits before you fill in your **hours used** or **repeated use** values.
 - f.  **Daily Average:** Some people complete activities in the daily section **a few times a week** rather than daily. Use the following formula to calculate use if students do not do an “everyday activity” daily, but a few times during the week.

$$\text{Daily Average} = \text{Hours used} / 7 \text{ days a week}$$

- g.  **Time Increments:** Use the following **time increments for Column B** to adjust calculations if students do not do an activity for a full hour.

Time Increments

Minutes	2 min.	5 min.	10 min.	15 min.	20 min.	30 min.	45 min.
Hour equivalent	.033	.083	.167	.25	.33	.5	.75

- h. **Heating and Cooling:** Use the **Seasonal Use Equivalent Chart** below to determine the daily hours used. Students should multiply hours used daily when in season by the **seasonal use factor** below.

$$\text{Seasonal Use Average} = \text{Hours used per day} \times \text{Seasonal Use Factor}$$

Seasonal Use Equivalent Chart

Months used	3 months	4 months	5 months	6 months	9 months	12 months
Seasonal Use Factor	1/4 or .25	1/3 or .33	5/12 or .42	1/2 or .5	3/4 or .75	No Change

For example the air conditioner is always on in your house for 24 hours each day during 3 months of summer. Your **seasonal use average** is

$$24 \text{ hours} \times .25 = 6$$

In this example, you would enter 6 in **Column B**.

4. **Understanding Summary Columns:** Notice Audit 2 has 4 new columns.

PERSONAL ENERGY AUDIT 2	NEW: Out of Pocket Cost/year	OLD: Out of Pocket Cost/year	Energy Reduction	Conservation Changes
NOTES:	<i>Cost/year= cost per day X 365 or Cost per week X 52 (or number of weeks used if seasonal)</i>	<i>Cost/year= cost per day X 365 or Cost per week X 52 (or number of weeks used if seasonal)</i>	Mark Y if there was a reduction in your energy consumption for each activity. Mark N if no change or increase.	List each new conservation practice you adopted for each usage over the past 6 weeks.
Ev Ac	NEW Out of pocket cost per year (dollars)	OLD Out of pocket cost per year (dollars)	Energy Reduction	Conservation Changes
En			Entry for Column M	Entry for Column N
Watch TV	12.05	36.14	Y	watched tv less/ used only one tv at a time
Charge your iPod/MP3 player	0.96	0.96	N	no change

Compare these columns for change in energy use

- Look at **Column K (New: Out of Pocket Cost/ year)**. This column is labeled “**NEW.**” These spreadsheet columns calculate the amount of money students’ current energy consumption activities cost.
- Column L (Old: Out of Pocket Cost/ year)** displays your students’ original energy use costs from the beginning of the unit.
- Column M (Energy Reduction)** provides a place for your students to note if they reduced their energy cost for each activity. For each row, instruct student to mark **Y** in the column if they reduced their energy consumption for that activity. Mark **N** if your student’s energy use costs stayed the same or increased.
 - In the example above, look at the **Watch TV row**. The old usage cost (Column L) is 33.00 and the new cost is 11.00. The energy cost is reduced. In this example, enter **Y** in Column M.
 - Look at the **Charge your iPod/ MP3 player row** above. There is no difference in the new and old costs (Columns K and L). In this example, enter **N** in Column M.
- In **Column N (Conservation Changes)**, Instruct students to write a description of any energy use changes they made for each activity since the beginning of the energy unit.
 - In the example above, look at **Column N** in the **Watch TV row**. This person reduced the amount of time she or he watched TV and also reduced the number of TVs that were turned on at the same time.
- Column O (Everyday Activity)** is a copy of the activity listed in **Column A**.



Step 3: Review and discuss students’ responses in a whole class discussion.