

Good Morning!

Please take out a calculator and a whiteboard:

On it, write the units of measurement that appear on an electric bill.

Account Number

1234-567-8910

Billing Date

Jun 18, 2007

Next Read Date

Jul 17, 2007

Service Provided to

Joe Electric

1234 Main Street

W BARNSTBL MA 02668

Account Summary

Previous Bill	115.30
Payment - Thank You	-115.30
Total Delivery Charges	50.30
Delivery Svcs Balance	450.30

Electricity Used**Rate 32-Residential Nonheat - Annual**

Meter 2300459

Jun 15, 2007 Actual Read 4846

May 16, 2007 Actual Read - 4187

30 Day Billed Use 659

2300459	KWH
06/15	659
05/16	512
04/17	509
03/16	538
02/14	539
01/15	783
12/14	714
11/14	479
10/17	435
09/18	552
08/17	1030
07/18	930
06/17	673

Cost of Electricity**Delivery Services**

Customer Charge			3.73
Distribution	.04825 X	659 KWH	31.80
Transition *	.01458 X	659 KWH	9.61
Transmission	.00482 X	659 KWH	3.18
Renewable Energy	.00050 X	659 KWH	0.33
Energy Conservation	.00250 X	659 KWH	1.65

Delivery Services Total 50.30

* PART OF WHAT WE COLLECT IN THE TRANSITION
CHARGE IS OWNED BY CEC FUNDING LLC

c Residential Service - Current Period Detail

Service 12/04/2012 to 01/07/2013 - 34 days

r charge					\$7.17
on Charges	708 kWh	X	\$0.07660		54.23
gy Portfolio Standard	708 kWh	X	0.00070		0.50
ssion Charges	708 kWh	X	0.00960		6.80
on Charges	708 kWh	X	0.06190		43.83
k Adjustment					-0.11

Current Charges

\$112.42

13-Month Usage (Total kWh)



Your Usage Profile

Period	Usage	Avg Daily Usage	Days	Avg Daily Temp
Current Month	708	20.8	34	41
Last Month	532	16.1	33	44
Last Year	705	20.7	34	42

Avg kWh per Month	517
Total Annual kWh Usage	6,213

Peco Bill

Energy is billed in kilowatt hours.

We can convert KWH to joules.

$$1 \text{ watt} = 1 \text{ J/s} \quad \& \quad 1 \text{ KWH} = 3.6 \times 10^6 \text{ J}$$

$$\frac{\cancel{1 \text{ KWH}}}{\cancel{1}} \cdot \frac{1000 \text{ W}}{\cancel{1 \text{ kW}}} \cdot \frac{3600 \text{ s}}{\cancel{1 \text{ h}}}$$

$$1000 \text{ W} = \frac{1000 \text{ J}}{1 \cancel{\text{s}}} \cdot \frac{3600 \cancel{\text{s}}}{1}$$

$$P=IV, P=I^2R, P=V^2/R$$

$$P \text{ [watts} = \text{J/s]}$$

$$\text{Energy} = Pt = IVt = I^2Rt = \left(V^2/R\right)t$$

$$\text{Energy (E) [Joules} = \text{J]}$$

A refrigerator is plugged into a 120V plug and has an average power rating of 60W. How many joules of energy does it consume in a month? Assume that the refrigerator only runs 1/3 of the time.

$$P = 60W \quad t = 8 \text{ hrs}$$

$$\frac{60J}{1.8} \cdot \frac{8 \text{ hrs}}{1} \cdot \frac{3600s}{1 \text{ hr}} = 1.782 \times 10^7 J$$

$$\frac{1.782 \times 10^7 J}{1 \text{ day}} \times \frac{30 \text{ days}}{1 \text{ month}} = 5.346 \times 10^8 J / \text{mo}$$

If Peco charges 9.5 cents per KWH, how much does it cost to run your refrigerator for a month?

$$5.346 \times 10^8 \text{ J/mo}$$

$$1 \text{ KWH} = 3.6 \times 10^6 \text{ J}$$

$$\frac{5.346 \times 10^8 \text{ J} \cancel{\text{mo}}}{1} \times \frac{1 \cancel{\text{KWH}}}{3.6 \times 10^6 \cancel{\text{J}}} \times \frac{\$0.095}{1 \cancel{\text{KWH}}}$$

$$\$14.11$$

Mr. Breish uses a hair dryer for 2 minutes every morning. If a hair drier is 1400w, how much does it cost per month to use the hair dryer?

$$\frac{1400 \cancel{\text{J}}}{1 \cancel{\text{s}}} \cdot \frac{120 \cancel{\text{s}}}{1 \cancel{\text{day}}} \cdot \frac{30 \cancel{\text{day}}}{1 \text{ mo}} \cdot \frac{1 \cancel{\text{KWh}}}{3.6 \times 10^6 \cancel{\text{J}}}$$

$$\frac{\$0.045}{1 \cancel{\text{KWh}}} = \$0.133$$

My electric bill:

You are going to create a spreadsheet for your electrical consumption and cost per month.

One person from each lab pair get a laptop and the other get a packet with the power consumptions for common household appliances.

Open excel. Save the file as 3lastnamespeco
example: 3breishhenselpeco

You and your lab partner will create a spreadsheet that illustrates the electrical use of a normal household.

You will list at least 10 household items on a spreadsheet.

You will then determine the total cost of operating this household if 1KWH costs \$0.095. Not much right?

Columns:

A: Appliance name

B: Power rating W

C: Hours of use per day (think critically).

D: Joules per day

E: Joules per month

F: KWH per month

G: Cost per month

$$1 \text{ KWH} = \$ 0.095$$

You can use excell to do the math for you.

If you want to use existing values that are already on the spreadsheet, you can manipulate them.

Once this function is done for one row, you can apply the math down an entire column.

See the example on school wires.

When finished, put the file in my drop folder.

Please work on the **last** quest assignmnet:
due tonight at 10:00pm.

There is a quiz topics list on school wires. If you are not going to be in class tomorrow, please take a look at it and ask questions about quiz material.