Understanding Energy Costs

Lesson 1 : Why do I have to turn the lights off?

Objectives: After completing this lesson students will be able to:

-Discuss how using energy at home has a cost associated with it

-Analyze an energy bill

Teacher Interest approach:

Energy is all around us but we often don't think about it. We need energy to run our bodies, our vehicles and our homes. When we need energy we eat. When we need to run our car we add gas. When we need to turn on our lights we flip a switch. Have you ever stopped to think of where this energy comes from?

Let's take a minute to go through some of the places we get energy from. List the sources where we can purchase energy.

Energy for our bodies:

Energy for our vehicles:

Energy for our homes:

It is easy to find sources of energy for our bodies, there are lots of places every day to get food. We also can easily name where we get our fuel for our vehicles, but powering our home is a little more difficult. Is it magic? No! it comes from our local energy provider. Is it free? No. Ever wonder why your mom gets upset when you leave the lights on and you're not in the room? Well, the energy to power our homes costs money, just like the food you eat and the gas you put in your car. It just is harder to see.

So how do we pay for it? While you might not pay attention to it your parents receive a monthly bill based on the amount of energy they use. Today we are going to take a look at a bill and see what we can learn.

So why do I have to turn the lights off?-Student Handout (1/2)

Name_____

Class_____

Account Number:	[redacted]
Statement Date 09/01/2015	Amount Due Upon Receipt $442.50
Delinquent After 09/20/2015	Delinquent Amount

REGULAR BILL

121 Amount Enclosed $ AUTOMATIC PMT

To insure prompt payment mail your bill 7-10 days prior to due date or pay online at www.sre.coop.

[redacted]

Address Change? Please correct above.

☐ Check here if completed reverse side of statement to sign up for Automatic Payment Service.

Page 1

Please return this portion with your payment. THANK YOU.

A Message from Scenic Rivers Energy Cooperative

October Member Appreciation
see Watt's Happening p. 1

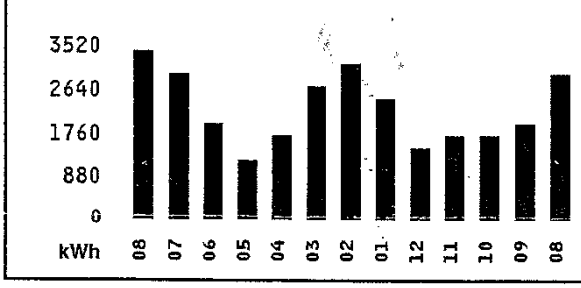
Billing Summary For Account Number: [redacted]

Balance from Last Billing:	$384.53
Payments	$384.53-
Balance Forward	$0.00
Current Charges	$442.50
Total Amount Due	$442.50

Location	Service Description	Meter #	From	To	Days	Begin Rdg	End Rdg	Usage	Mult
L13-D21-0003	3504 MARTIN RD	51753554	07/24/15	08/25/15	032	93941	97449	3508	1

	Avg Daily Usage	Avg Daily Cost
This Month	109	$13.23
Last Year	97	$11.73

Usage History - Last 12 Months



3508 KWH @ .109600	384.48
Power Cost Adjust	7.02
Fixed Charge (32 DAYS @ $1.00)	32.00
Non Taxable Public Benefits	1.45
Daily Load Control Credit	5.44-
State Sales Tax	20.90
County Tax	2.09
TOTAL FOR METER	442.50

So why do I have to turn the lights off?-Student Handout (2/2)

Take a look at the sample energy bill. To get a better idea of what energy costs, let's answers some questions.

How many KWH(Kilowatt Hours) did this customer use during the month?

What is the cost per KWH?

How many days where in the month?

What is the daily charge that is billed in addition to the energy used?

What types of taxes does this customer have to pay on the energy bill?

Energy is measured by a meter at your house. What was the beginning reading and the end reading for this customer?

How does the energy this customer used this hear in the month of September compare to energy used last year?

What are some factors that might contribute to the difference in the bill?

Now look at the Usage History-Last 12 months? The numbers represent months, so for example, 05 means May. What do you notice about this bill? What conclusions might you make about this customer?

Lesson 2: How much is does that light cost?

Objectives: After completing this lesson students will be able to:

-Identify uses of energy in the home and at school

-Calculate the cost of running household items.

Teacher Interest approach:

So now that you know where your electricity comes from and how you pay for it. Let's see how we can figure out what the items in our house cost. There are four easy steps to make this calculation.

Step 1: Calculate the watts and item uses per day.

By looking at the item or it's label, you can find the wattage. So let's use the 60 watt light bulb that is in the kitchen. It is on for 3 hours a day. So multiple 60 watts by three hours and we get 180 watt hours per day.

Step 2: Convert the watt hours to kilowatts.

Energy is billed by the kilowatt hour. So we need to convert our watts to kilowatts. There are 1,000 kilowatts in a watt, so 180 watt hours are 0.180 kilowatts.

Step 3: Multiply the Kilowatts per day by the number of days.

From our last example, there were 32 days so multiple 0.180 x32 days equals 5.76 kilowatt hours.

Step 4: Calculate the cost.

From our calculations, it takes 5.76 kilowatt hours to run the light bulb in the kitchen. From our sample bill it cost $0.10 a kilowatt hour. So the cost of a the light bulb in the kitchen for 3 hours a day is $0.576.

While the few cents it costs to run the light bulb does not seem like a lot, it can add up fast.

To get a better feel for your house you will be completing an assignment to see what it costs to run our classroom.

How much does that light cost?-Student Handout

Name_____

Class_____

Classroom Item	Watts Hours	Kilowatts Hours	Monthly(30 Days)	Cost ($0.10 per kilowatt hour)
12 Light Fixtures each with 2 florescent bulbs 35 watts on 9 hours a day				
Smartboard projector 150 watts on 2 hours per day				
4 classroom computers 165 watts on 3 hours per day				
Teacher laptop155 watts on 8 hours per day				
Turtle Tank Filter 50 watts on 24 hours per day				
Microwave 750 watts on .2 hours per day				
Printer 200 watts 1 hour per day				
Totals				

Lesson 3: A Penny Saved is a Penny Earned

Objectives: After completing this lesson students will be able to:

-Identify ways to save energy at home

-Make recommendations to reduce energy bills

Teacher Interest approach:

In our last activity we learned how quickly costs to power our room or home can add up. Guess what? There are lots of ways to save energy. Now that you have a better understanding of energy costs, you are going to conduct a home energy audit.

There are lots of ways to save money at home. Many can be found at https://www.saveonenergy.com/energy-saving-tips/save-on-your-power-bill/ . Take a look at the site before you complete your audit.

This audit will use specific information about your home to give you a better idea about how to reduce your energy usage which results in savings you can see month after month.

A Penny Saved is a Penny Earned –Student Handout

Name_____

Class_____

To complete this assignment you will need to do a home energy audit. Audit is kind of like a check-up for your home. Please complete the audit with a parent or guardian that you live with. Through this audit you may identify areas where you can save energy and money!

Area # 1 Computers

Screensavers increase energy consumption of computers. Settings should be set to go to sleep after 10 minutes.

Done and will maintain Will Consider Doing No computer in the home

Area #2 Unused electronics

Unplugging items not in use like chargers, lamps, and small appliances can save up to $165 dollars a year or around $14 a month

Done and will maintain Will Consider Doing No extra items plugged in

Area #3 Using Power Strips

Power strips stop large electronics, including TV's and video game consoles, from stealing "standby power".

Done and will maintain Will Consider Doing No TV or large appliance

Area #4 Replacing Incandescent light bulbs

When compact florescent light bulbs replace traditional light bulbs it can save $57 over the life time of the bulb.

Done and will maintain Will Consider Doing

Area #5 Close the fireplace damper

Home air can escape through the chimney. The damper should be closed when not in use to prevent this.

Done and will maintain Will Consider Doing Don't have a fireplace

Other ideas to save energy we discussed:

We have completed our home energy audit and discussed the above items.

Adult signature _____