

ACTIVITY 1

IT ALL ADDS UP

Do you know how much energy your family uses? Every month, your power company or electric cooperative sends your family a bill for the electric energy you have used. The bill shows how much the energy costs and how much energy you have used in recent months. To start saving energy, you need to take a close look at those numbers.

Part A. There are a number of utility providers and electric cooperatives in Virginia. Bills can vary slightly based on provider, but they all contain the same basic information. We're going to look at a sample bill to help you better understand your home bill and electricity use. For more detailed bill information, refer to additional resources at www.virginiaenergysense.org/school.

Electricity Bill

| Billing and Payment Summary | | Explanation of Bill Detail | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|-----------------------------------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|----|------|-----|-----|-----|-----|-----|-----|-----|------------------------------|--|
| Account # 78787847874 | Due Date: Dec 14, 20XX | Customer Service | 1866-666 HELP | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Amount Due: | \$154.35 | Previous Balance | \$97.22 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| To avoid Late Payment Charge please pay by Dec 14, 20XX | | Payment Received | \$97.22 CR | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Previous Amount Due: | \$97.22 | Balance Forward | \$0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Meter and Usage | | Residential Service | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Current Billing Days: 30 | Usage History | Distribution Service | \$31.98 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Billable Usage | <table border="1" style="font-size: 8px; border-collapse: collapse;"> <thead> <tr> <th>Month</th> <th>kWh</th> </tr> </thead> <tbody> <tr><td>Jan</td><td>580</td></tr> <tr><td>Feb</td><td>620</td></tr> <tr><td>Mar</td><td>480</td></tr> <tr><td>Apr</td><td>300</td></tr> <tr><td>May</td><td>202</td></tr> <tr><td>June</td><td>100</td></tr> <tr><td>July</td><td>150</td></tr> <tr><td>Aug</td><td>80</td></tr> <tr><td>Sept</td><td>105</td></tr> <tr><td>Oct</td><td>220</td></tr> <tr><td>Nov</td><td>350</td></tr> <tr><td>Dec</td><td>580</td></tr> </tbody> </table> | Month | kWh | Jan | 580 | Feb | 620 | Mar | 480 | Apr | 300 | May | 202 | June | 100 | July | 150 | Aug | 80 | Sept | 105 | Oct | 220 | Nov | 350 | Dec | 580 | Electricity Supply Svc (ESS) | |
| Month | kWh | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Jan | 580 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Feb | 620 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mar | 480 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Apr | 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| May | 202 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| June | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| July | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Aug | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sept | 105 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Oct | 220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nov | 350 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Dec | 580 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bill Date Nov 19 | | Generation | \$50.93 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Please Pay by 12/14 | | Transmission | \$12.87 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \$154.35 | | Fuel | \$52.86 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Sales and Use Surcharge | \$0.70 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | State/Local Consumption Tax | \$2.01 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Utility Tax | \$3.00 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Total Current Charges | \$154.35 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Total Account Balance | \$154.35 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Amount Enclosed | | | | | | | | | | | | | | | | | | | | | | | | | | | |

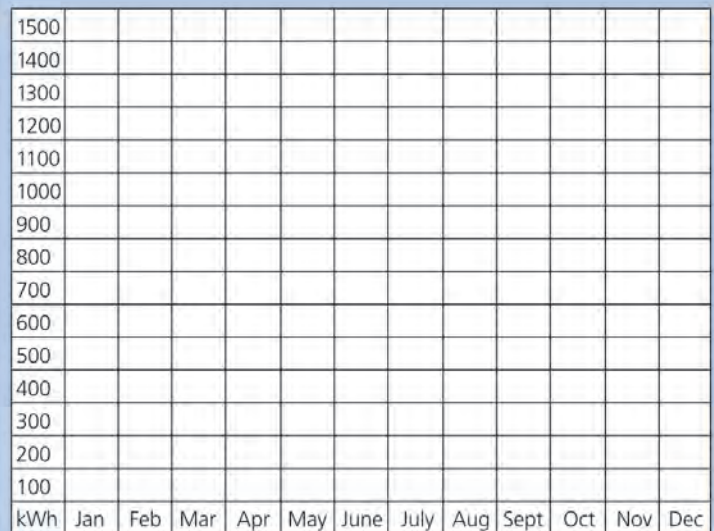
The **Billing and Payment Summary** at the top shows the customer's account number, the date the payment is due, the amount due, and payments since the last bill.

The **Meter and Usage section** shows how much electricity the customer used during the current billing cycle and how much electricity they used each month during the past year. These amounts are shown in a unit of measurement called *kilowatt hours (kWh)*. Kilowatt hours are units used to measure your electric use over time. Using 1,000 watts of electricity for 1 hour means that you used 1 kWh (1000 watts per hour = 1 kWh). Your total bill is calculated by taking the number of kWh used and multiplying by cents per kWh.

The **Explanation of Bill Detail** shows how much the customer owed last month, how much was paid, and what is still owed. It also shows itemized power charges for:

- **Distribution Service:** The charge for wires, transformers, and other equipment used to deliver electricity.
- **Electricity Supply Service:** The costs of generating the electricity (Generation) and moving it from the power plant to a local substation (Transmission). This also includes the cost for the fuel that was used to produce the electricity.
- **State, Local, and Utility Taxes:** Taxes based on the amount of energy used by customers and a tax imposed on energy services by local ordinance.

Let's take a look at the kWh of electricity this customer used each month during the last year. In the space below, make a bar graph using the monthly usage information on the bill.



- When was the monthly bill the highest? What might have contributed to that spike?
- If a Virginia family uses an average of 1000 kWh of energy per month, and the average cost is 10.7 cents/kWh, what is their average monthly bill?

Part B. Now, look at your family's monthly bill. On the back of this paper, graph your family's monthly energy usage for the past year. How much did your family spend on electric energy each month for the last 10 months?

VALUE YOUR POWER

VIRGINIA ENERGY SENSE

FIND OUT MORE ABOUT HOW YOU CAN SAVE ENERGY AT

www.virginiaenergysense.org/school



ACTIVITY 2

SAVING AT HOME

In the first activity, we tracked energy usage for one year, and we talked about how factors such as weather affect energy usage. Now we're going to focus on saving energy, and we'll start by figuring out how much energy is used by some common household appliances.

Part A. You can find out how much energy an appliance uses by looking for the "wattage" on the appliance nameplate. A 5000 watt clothes dryer, for example, uses 5000 watts of energy per hour. Use this formula to figure out how many kilowatt hours (kWh) of energy you're using if you run the clothes dryer for two hours:

$$5000 \text{ watts} \times 2 \div 1000 = \boxed{}$$

$$\text{Wattage} \times \text{Number of hours} \div 1000 = \text{kWh}$$

That's a lot of energy! Just imagine how much you could save if you hung your clothes out to dry instead of putting them in the dryer.

Part B. How much energy is your family using to run appliances? Use this chart to find out. The chart lists the typical wattage for five appliances. Estimate how many hours per week you run each of these appliances. Then use the typical wattage numbers to figure out how many kilowatt hours (kWh) of energy your family uses each week to run these five appliances. Bring the chart back to class and compare answers with your classmates.

| Appliance | Typical wattage* | How many hours per week? | kWh of energy used per week |
|---------------------------|------------------|------------------------------|-----------------------------|
| Clothes dryer | 5000 watts | \times _____ \div 1000 = | _____ |
| Dishwasher | 2400 watts | \times _____ \div 1000 = | _____ |
| Hair dryer | 1200 watts | \times _____ \div 1000 = | _____ |
| Microwave | 750 watts | \times _____ \div 1000 = | _____ |
| Flat screen TV | 120 watts | \times _____ \div 1000 = | _____ |
| TOTAL kWh per week | | | _____ |

Part C. How much energy could we save if every family used the dishwasher one less hour per week? That's not so hard to do if you wait until the dishwasher is full before you run it. And the savings add up quickly. Just in your class, you could probably save more than 50 kWh per week! And imagine what your whole school could save!

In a class discussion, brainstorm some other ways you could cut down on using energy around the house. Then share your ideas. For more information on electricity use and conservation, go to www.virginiaenergysense.org/school.

*See www.energysavers.gov/your_home/appliances/index.cfm/mytopic=10040

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ACTIVITY 3

REPRODUCIBLE ACTIVITY

VALUE YOUR POWER FAMILY SCOREBOARD

Now it's time to take the **Value Your Power** family challenge! For the next week, use this scoreboard to track how your family uses and conserves energy. Include things you already do and new things you can start to do. We've helped you get started. With your family members, find other things to add to the list. Hang this checklist on your fridge as a reminder for everyone in your home and place a check mark in the box each time you or a member of your family does one of these things each day.

OUR FAMILY'S VALUE YOUR POWER SCOREBOARD

| | | | | | | | |
|---|--|--|--|--|--|--|--|
| Date | | | | | | | |
| Turn off lights when leaving a room | | | | | | | |
| Unplug energy vampires | | | | | | | |
| Keep the thermostat one degree lower | | | | | | | |
| Run your washing machine with cold water only | | | | | | | |
| | | | | | | | |
| | | | | | | | |

I will bring my scoreboard back to class on _____.

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