

Name: _____



ENERGY EXPERT PATCH

Senior & Ambassador Workbook

Consumers Energy

Count on Us

PROVIDING ENERGY EDUCATION TO STUDENTS IN THE COMMUNITIES
WE SERVE. THAT'S OUR PROMISE TO MICHIGAN.

For more great energy resources visit:
www.ConsumersEnergy.com/kids

Hey there Scouts!

Ready to earn your Energy Expert patch? This book will guide you through the many ways energy affects our lives – to make you an energy expert!

1. Energy Safety
2. Sources of Energy
3. Energy Use
4. Energy STAR
5. Energy Efficiency
6. Energy Conservation
7. Energy Pioneers
8. Energy Careers
9. Energy in Your Community
10. Educating Others About Energy

This book can be completed individually or as a group. As seniors and ambassadors you can be an example in your community when it comes to saving energy, educating others, and using energy every day.

Questions? Feel free to email us at education@consumersenergy.com

1. ENERGY SAFETY

FIRST go to www.ConsumersEnergy.com/students and click on “Protect Your Noggin”

Write down 1 safety message from each category that you can share with a loved one.

Electric Safety:

Natural Gas Safety:

Carbon Monoxide (C.O.):

Ask for I.D:

Right Tree, Right Place:

NEXT read the stories of real survivors who have been shocked by **electricity**. The link is located under “Electric Safety.”

What surprised you about their stories? How can you share your knowledge to protect others from getting hurt this way?

FINALLY take the electric and natural gas home safety quizzes, then print them off and give them to your adult to have the safety hazards fixed.

2. SOURCES OF ENERGY

FIRST choose an energy source to research.

Nuclear	Hydroelectric	Natural Gas	Coal
Solar	Wind	Biomass	Oil

NEXT research your source using the internet, library, and utility companies.

Here are some helpful websites to get you started:

www.ConsumersEnergy.com

U.S. Energy Information Administration www.eia.gov/kids

U.S. Department of Energy www.energy.gov

FINALLY answer the following questions about your source.

- A. Is your source renewable or non-renewable?

- B. How is electricity generated from your source?

- C. Is your source available everywhere? If not, how is it transported or why isn't it available for generation everywhere?

- D. How does your source affect the environment? What technology is used to decrease the effect?

- E. How does your source affect the community? Can you find a local example?

3. ENERGY USE

FIRST learn to read an energy bill, **THEN** answer the questions below

It might not sound like fun, but knowing how to read your energy bill is very important, to save money and know whether or not you are an energy hog!

Electric Residential Service

Rate: 10005

Kilowatt-hours used: 1358 KWH

Meter reading: 27714 - 29072 (actual)

Meter Number: 44261576

POD: 0000001472109

Electric Power Supply Charges

KWH-Energy First	600 @ 0.070923	\$42.55
KWH-Energy Next	758 @ 0.130992	\$99.29
Power Supply Cost Recovery	1358 @ 0.000520-	\$0.71-
Renewable Energy		\$2.50

Electric Delivery Charges

System Access		\$6.00
Elec Distribution	1358 @ 0.027489	\$37.33
Other Surcharges *		\$4.79
Energy Optimization	1358 @ 0.001430	\$1.94
Securitization	1358 @ 0.001327	\$1.80
Securitization Tax	1358 @ 0.000629	\$0.85

Total Electric \$196.34



July Electric use 1358 KWH
 Electric use per day 44 KWH
 Electric cost per day \$6.33

Gas Residential Service

Rate: 250

Thousand cubic feet used: 3.0 MCF

Meter reading: 7207 - 7237 (actual)

Meter Number: 8528536

POD: 0000001472110

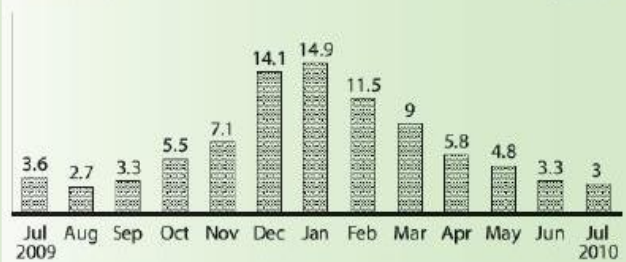
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Correction factor: 1.00000

Gas Charges

Customer Charge		\$10.50
Gas Distribution	3.0 @ 2.428900	\$7.29
Energy Optimization	3.0 @ 0.172200	\$0.52
Gas Cost Recovery	3.0 @ 6.993400	\$20.98

Total Gas \$39.29



July Gas use 3.0 MCF
 Gas use per day 0.097 MCF
 Gas cost per day \$1.27

How long is the billing period?

How many total kilowatt-hours were used in this billing period?

What unit is natural gas measured in?

How much money would you save on this bill if you used 4 kWh less per day?

$$\frac{\text{Monthly Cost } \$196.34}{\text{Monthly kWh } 1358} = \$ \underline{\hspace{2cm}} \text{ per kWh}$$

$$40 \text{ kWh} \times 31 \text{ days} = \underline{\hspace{2cm}} \times \$ \underline{\hspace{2cm}} \text{ per kWh} = \$ \underline{\hspace{2cm}} \text{ new monthly cost}$$

$$\text{Old monthly cost} - \text{new monthly cost} = \$\$ \$ \text{ Saved}$$

GO TO www.ConsumersEnergy.com/smartenergy and watch the “What are the benefits?” video

What are the new devices energy companies will use to measure your energy? How do they work?



How Much Does it Cost?

Electricity costs money. Being energy efficient can help the environment and save your family money!

Use this formula to calculate how much devices in your home cost.

Device	Watts	Hours Used	Kwh	Price per Kwh	Cost per day Kwh x price	Cost per year
TV	130	4	$\frac{130 \times 4}{1,000} = 0.52$	\$0.10	$0.52 \times 0.10 = \$0.05$	$\$0.05 \times 365 = \18.25
Laptop	220	6	$\frac{220 \times 6}{1,000}$	\$0.10	$1.32 \times 0.10 =$	
Cell Phone Charger	3	24		\$0.10		

NOW choose 3 devices in your home, look up their wattage, and calculate the cost

What's one thing you can do starting today to save energy?

4. ENERGY STAR

FIRST go to www.energystar.gov

THEN answer the following questions:

1. What does the ENERGY STAR rating mean?
2. What kinds of products have the ENERGY STAR rating?
3. On average how much less energy do ENERGY STAR rated products use (in percent)?
4. Which government agencies are in charge of qualifying products for the ENERGY STAR rating?
5. Does your energy company offer discounts or rebates for ENERGY STAR rated products? You might have to go to your energy company's website to get this information.
6. With a parent, identify how many products and appliances in your home are ENERGY STAR rated. Are there any products that could be upgraded to ENERGY STAR? Research how much it would cost to upgrade and how much energy would be saved.



5. ENERGY EFFICIENCY

FIRST pick a room in your house you think can be more energy efficient.

THEN research how you could redesign or add things to this room to make it more energy efficient. For ideas, visit www.ConsumersEnergy.com

If any, what appliances did you replace?

If any, what fixtures (lights, windows, etc) did you replace?

What parts of your design helped with the heating and cooling of your room? Heating and cooling are the biggest energy wasters in a house.

Approximately how much will this renovation cost?

Draw the best layout to make this room energy efficient. Think about where lights, vents, windows and outlets are located.

6. ENERGY CONSERVATION

Energy efficiency means using technology to help decrease energy use.

Energy conservation means changing behaviors to decrease energy use.

There are 3 great behaviors to help conserve energy:

Reduce Reuse Recycle

- 1. Come up with 3 ways you can reduce your energy consumption.** Think about how you can reduce how much trash you throw away, what electronics you leave on, and how often you turn up the air conditioning or heat.

- 2. Pick something you would normally throw away and reuse it by turning it into something else.** You can create a craft or even something useful. Go to www.ConsumersEnergy.com/students and click on “Calendars and Activities” for some ideas. Take a picture of your creation and share it with friends.

- 3. Research a company that recycles items, turning them into something else.**
 - a. What item(s) do they recycle? What do they turn it into?

 - b. Do you think this benefits your community? Why or why not?

 - c. Can you think of a way to encourage your school or community to donate these items?

7. ENERGY PIONEERS

Women have worked in the energy field for a long time and have contributed some amazing discoveries. Research these 3 women pioneers in the field of energy.

	Isabella Karle	Marie Curie	Zan Lombardo
Where and when were they born?			
What degrees did they achieve?			
What did they contribute to the energy field?			
What inspired you most about their story?			

If you had to pick one topic on energy to study, what would it be?

8. ENERGY CAREERS

CHOOSE one of the following options to learn about a career in energy.

- A. Interview someone who works in the energy industry over the phone.
- B. Job shadow and spend the day with someone who works in the energy industry.
- C. Invite a guest speaker from the energy industry to talk to a group.

WRITE 10 QUESTIONS you will ask this person once you talk with them.

1. What is your job title?
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

TIPS for finding and contacting energy employees:

- Check websites of utility companies like Consumers Energy, government agencies like the EPA, or professional organizations like the Society of Petroleum Engineers.
- Ask family, friends and teachers if they know anyone who works with energy.
- Be flexible and offer different options such as over the phone, over Skype, or in person.
- If you are interested in someone from Consumers Energy, feel free to contact our Education Programs manager at 517-788-1347

9. ENERGY IN YOUR COMMUNITY

FIRST find your local city council's website and find out when and where they host meetings.

THEN identify an issue, idea, or event related to energy in your community.

PLAN on attending a city council meeting and present your issue, idea or event. Make sure to put your idea in writing and make copies for attendees.

10. EDUCATING OTHERS ABOUT ENERGY

FIRST choose a topic on energy from this book that you could teach to others. Ideas could include energy safety, careers, conservation, sources, etc.

THEN decide who would benefit most in your community to learn about your topic. Could it be younger Scouts, students at your school, or adults?

FINALLY put together a presentation. Use this checklist to make it great!

- Visual aid, like a power point or poster
- Hands on activity
- Tell a story to show attendees why your topic is important
- Give them something to take home to help them remember your topic, like a brochure or door hanger
- Give them a specific action they can do to help your cause right away