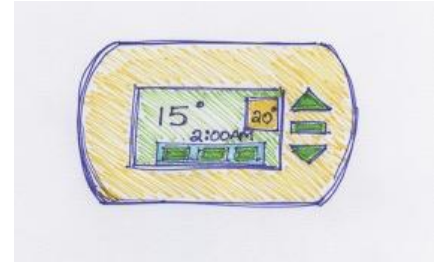




Energy Campaign

TURN DOWN THE HEAT (Sweater Days)

Turn down the thermostat to save energy and reduce greenhouse gas emissions at home or in school. Put on a sweater or take activity breaks to stay warm.



Background

In Saskatchewan, most schools and homes are heated with natural gas.* Burning natural gas produces greenhouse gas emissions that contribute to climate change. Turning down the thermostat when we are asleep or away is a good way to reduce energy use and emissions, and save money.

***Note: other building heat sources in SK are electricity, propane, and heating oil, the use of which produce even more greenhouse gas emissions.**

- Turning down the heat 5°C at night will save 370 kgCO_{2e}/year, 7 gigajoules (GJ) of natural gas/year and \$4/month.
- Turning down the heat 3°C during the day when no one is home will save 220 kgCO_{2e}/year, 4 GJ of natural gas/year and \$2/month.
- In winter, indoor temperatures of 20°C to 22°C are reasonable. Turn down the heat 2°C to 5°C when you are sleeping or away.
- Save 2% on your heating bill for every 1°C you turn down your thermostat overnight. [SaskEnergy](#)
- Every GJ of natural gas used by you in your home or at school produces 50kgCO_{2e}.

Turn Down the Heat at School

School pre campaign audit

Use the chart below or create your own.

1. Record the outdoor temperature.
2. Record the thermostat settings in a few different rooms in the school.
3. Ask a number of students and staff the following questions:
 - If you feel too warm at school, what do you do?
 - If you feel too cold at school, what do you do?



School	Day 1	Day 2
Outdoor temperature (°C)		
Room: Thermostat setting (°C)		
Room: Thermostat setting (°C)		
Room: Thermostat setting (°C)		

School campaign planning

Plan a week, or one day a week for a month, where the school thermostat is turned down 2°C. Work with the caretaker to plan which days to make the change. Use the chart below to record thermostat settings on your campaign days.

Communicate:

- Create posters and announcements that let people know what you are doing, why you are doing it, and how they can prepare for “Turn Down the Heat, Sweater Days”.
- Create newsletter items for families that let them know how they can reduce thermostat settings at home during the day, or overnight, to save energy and money, and reduce greenhouse gas emissions.

Make it fun:

- Include a sweater contest on a theme: *wear your brightest, or “goofiest” holiday sweater, and/or*
- Lead activity breaks to warm people up.

School	Day 1	Day 2	Day 3	Day 4	Day 5
Outdoor temperature (°C)					
Thermostat setting today (°C)					



School post campaign audit

1. Ask a number of students and staff the following questions:
 - When the heat is turned down, are you warm or cold? If warm, what do you do? If cold, what do you do?
 - Outdoor temperature: did changes in outdoor temperature affect how you felt inside?
 - Did your family turn down the heat during the day because of this school campaign? If so, by how much?
 - Did your family turn down the heat at night because of this school campaign? If so, by how much?
2. Make it a regular event at your school, like *sweater Fridays*, and add up how many days you've had the heat down over the school year.

Turn Down the Heat at Home

Home pre campaign audit

Use the charts below or create your own.

1. Record the outdoor temperature.
2. What temperature do you/your family keep your home?
 - During the day when you are home
 - During the day when no one is home
 - During the night when everyone is sleeping

HOME Date:	At home	Not at home	At night
Outdoor temperature (°C)			
Thermostat setting (°C)			

3. Check your natural gas bill (SaskEnergy bill) for the month before you make any changes. (see the example bill on page 6)
 - How much gas did you use?
 - How much did this cost?
 - Record this information on the chart on page 4.
 - Use the chart on page 4 to calculate the greenhouse gas emissions.



Note: Natural gas is measured in cubic meters (m³) on utility bills. To convert m³ to gigajoules (GJ):

26.9 cubic meters (m³) natural gas = 1.0 Gigajoules (GJ)

e.g. April 2019: 163 m³ ÷ 26.9 = 6.06 GJ (see the example utility bill on page 6)

Utility Bill:		
Date:		
Days of billing (circled in green on the example bill):		
	Per month	Per day (divide by number of billing days in the month)
Natural gas use in cubic meters (m ³) (circled in yellow on the example bill)		
Natural gas use in GJ (=m ³ ÷ 26.9)		
Greenhouse gas emissions (=GJ x 50kgCO _{2e})		
Cost (total monthly amount – basic monthly service charge = cost of energy) (see red highlighting on the example bill)		

Home campaign

If you have a **programmable thermostat**:

For the night, when everyone is in bed:

- program it to turn down the heat by 2°C – 5°C, and
- program it to increase the heat again before you wake up.

During the day, when no one is home:

- program it to turn down the heat by 2°C – 3°C, and
- program it to increase the heat again before you arrive home.



If you **don't have a programmable thermostat** (the hardest part is remembering, so make yourself a note!):

Before you go to bed, or leave the house for the day:

- Turn down the heat by 2°C – 5°C, and

When you get up, or arrive home:

- Turn up the heat again.

To calculate savings:

- Fill out the following chart each day you turn down the heat, and calculate energy saved, money saved, and greenhouse gases reduced.
- Compare the next heating bill with your last. (**Note – changes in outdoor temperatures can have a very large effect on your consumption**) How much did your natural gas consumption change? How did the weather compare between your pre-audit and post-audit?


HOME	At home	Not at home	At night	Actual per day	Total Savings
New thermostat setting (°C)				= (at home + not at home + at night) = per day	(multiply "per day" by the number of days you turned down the heat)
Energy saved (GJ) = daily gas use x number of degrees turned down x 0.02					
Greenhouse gas emissions (kgCO _{2e}) = GJ x 50kgCO _{2e}					
Money saved (\$) = daily cost x number of degrees turned down x 0.02					



Example natural gas bill

To calculate the cost of the energy, use the total bill amount, minus the basic monthly service charge – which on this bill is \$23.20. **Note – the total amount is shown at the bottom of the bill (circled in red).**

- Monthly energy cost. $\$66.67 - \$23.20 = \$43.47$
- To find the daily energy cost, divide the monthly cost by the number of days. (days of billing) $\$43.47 \div 33 = \1.32



SERVICE SUPPLIED TO

[Redacted]

CUSTOMER REFERENCE

[Redacted]

IMPORTANT MESSAGES
Effective April 1, 2019, the Government of Saskatchewan has approved a change to both the Commodity and Delivery Service Rates. The Commodity Rate has decreased from \$2.95/GJ (\$0.1136 m3) to \$2.575/GJ (\$0.0998 m3). The Delivery Rate has increased, on average, by 3.4%. Visit saskenergy.com for more information.

CUSTOMER INQUIRIES
www.saskenergy.com
PHONE: 1-800-567-8899

Moving? Visit us at expressaddress.com

CUSTOMER KEEP THIS PORTION

Account Number	Type of Billing	Rate	Days of Billing	
[Redacted]	Actual	Residential	33	0001R 177556300451
Present Reading	Previous Reading	Metric Factor	Billing Multiplier	Usage in m ³
(0921 - 0861)		X 2.724223	X 1	= 163.453
APR 24, 2019	MAR 22, 2019			
BILL ISSUED APR 29, 2019				
Balance from Previous Bill			\$ 100.45	\$
Payment Received - Thank You APR 18, 2019			100.45CR	
Balance Forward			0.00	0.00
GAS DELIVERY SERVICE (1772930767)				
* Basic Monthly Charge		\$23.20 / Month	16.87	
Delivery Charge	118.875 M ³	X \$0.0993 /M ³	11.80	
Municipal Surcharge City of Saskatoon		5% X \$28.67	1.43	
Federal GST R119429751		5% X \$30.10	1.51	
* Basic Monthly Charge		\$23.20 / Month	6.33	
Delivery Charge	44.578 M ³	X \$0.0924 /M ³	4.12	
Municipal Surcharge City of Saskatoon		5% X \$10.45	0.52	
Federal GST R119429751		5% X \$10.97	0.55	
			43.13	43.13
GAS SUPPLY COST				
Gas Supplied by SaskEnergy				
Gas Consumption Charge	118.875 M ³	X \$0.0998 /M ³	11.86	
Gas Consumption Charge	44.578 M ³	X \$0.1136 /M ³	5.06	
Municipal Surcharge City of Saskatoon		5% X \$16.92	0.85	
Federal GST R119429751		5% X \$17.77	0.89	
			18.66	18.66
FEDERAL CARBON TAX				
Federal Carbon Charge	118.875 M ³	X \$0.0391 /M ³	4.65	
Federal GST R119429751		5% X \$4.65	0.23	
			4.88	4.88
My Account Billing option: EMAIL ONLY				
Pre-Authorized Debit Amount			\$66.67	to be withdrawn on MAY 23, 2019

Amount Due

BILL IS DUE AND PAYABLE ON DATE OF ISSUE
LATE PAYMENT CHARGES WILL BE ASSESSED AFTER



Home post campaign audit

1. Ask your family the following questions:
 - When the heat is turned down, are you warm or cold? If warm, what do you do? If cold, what do you do?
 - Did your family turn down the heat during the day because of this campaign? If so, by how much?
 - Did your family turn down the heat at night because of this campaign? If so, by how much?
 - Outdoor temperature: did changes in outdoor temperature affect how you felt inside?
2. How much money did you save by turning down the heat? Multiply that amount by 180 days (typical heating days/yr) to estimate how much you might save over 1 year.
3. How much did you reduce greenhouse gases by turning down the heat? Multiply that amount by 180 days to estimate how much you might save over 1 year.

Additional resources

For tips on how to save energy use in your home:

- <http://environmentalsociety.ca/tip/room-temperature-home/>
- http://www.saskenergy.com/saving_energy/tips.asp



Curriculum connections

Grade 4 Social Studies: RW4.1 Analyze the strategies Saskatchewan people have developed to meet the challenges presented by the natural environment.

Mathematics: N4.1

Demonstrate an understanding of whole numbers to 10 000 (pictorially, physically, orally, in writing, and symbolically) by: representing, describing, comparing two numbers, ordering three or more numbers. **N4.2** Demonstrate an understanding of addition of whole numbers with answers to 10 000 and their corresponding subtractions (limited to 3 and 4-digit numerals) by: using personal strategies for adding and subtracting, estimating sums and differences, solving problems involving addition and subtraction. **N4.3** Demonstrate an understanding of multiplication of whole numbers (limited to numbers less than or equal to 10) by: applying mental mathematics strategies, explaining the results of multiplying by 0 and 1 **N4.7** Demonstrate an understanding of decimal numbers in tenths and hundredths (pictorially, orally, in writing, and symbolically) by: describing, representing, relating to fractions.

N4.8 Demonstrate an understanding of addition and subtraction of decimals limited to hundredths (concretely, pictorially, and symbolically) by: using compatible numbers, estimating sums and differences, using mental math strategies, solving problems.

P4.1 Demonstrate an understanding of patterns and relations by: identifying and describing patterns and relations in a chart, table or diagram, reproducing patterns and relations in a chart, table, or diagram using manipulatives, creating charts, tables, or diagrams to represent patterns and relations, solving problems involving patterns and relations. **SS4.1**

Demonstrate an understanding of time by: reading and recording time using digital and analog clocks (including 24 hour clocks), reading and recording calendar dates in a variety of formats.

Grade 5 Social Studies: RW5.1 Explain the importance of sustainable management of the environment to Canada's future.

Mathematics: N5.1 Represent, compare, and describe whole numbers to 1 000 000 within the contexts of place value and the base ten system, and quantity. **N5.2**

Analyze models of, develop strategies for, and carry out multiplication of whole numbers.

N5.6 Demonstrate understanding of decimals to thousandths by: describing and representing, relating to fractions, comparing and ordering. **N5.7** Demonstrate an understanding of addition and subtraction of decimals (limited to thousandths).

P5.1 Represent, analyse, and apply patterns using mathematical language and notation.

P5.2 Write, solve, and verify solutions of single-variable, one-step equations with whole number coefficients and whole number solutions. **SP5.1** Differentiate between first-hand and second-hand data.

Grade 6 Science: EL6.1 Assess personal, societal, economic, and environmental impacts of electricity use in Saskatchewan and propose actions to reduce those impacts.

Social Studies: RW6.2 Contribute to initiating and guiding change in local and global communities regarding environmental, social, and economic sustainability.

Mathematics: N6.3 Demonstrate understanding of the order of operations on whole numbers (excluding exponents) with and without technology. **N6.4** Extend understanding of multiplication and division to decimals (1-digit whole number multipliers and 1-digit natural number divisors). **P6.1** Extend



understanding of patterns and relationships in tables of values and graphs. **P6.2** Extend understanding of preservation of equality concretely, pictorially, physically, and symbolically. **P6.3** Extend understanding of patterns and relationships by using expressions and equations involving variables. **SP6.1** Extend understanding of data analysis to include: line graphs, graphs of discrete data, data collection through questionnaires, experiments, databases, and electronic media, interpolation and extrapolation. **SP6.2** Demonstrate understanding of probability by: determining sample space, differentiating between experimental and theoretical probability, determining the theoretical probability, determining the experimental probability, comparing experimental and theoretical probabilities.

Grade 7 Science: HT7.1 Assess the impact of past and current heating and cooling technologies related to food, clothing, and shelter on self, society, and the environment.
Mathematics: N7.2 Expand and demonstrate understanding of the addition, subtraction, multiplication, and division of decimals to greater numbers of decimal places, and the order of operations. **P7.3** Demonstrate an understanding of one- and two-step linear equations of the form $ax/b + c = d$ (where $a, b, c,$ and d are whole numbers, $c \leq d$ and $b \neq 0$) by modeling the solution of the equations concretely, pictorially, physically, and symbolically and explaining the solution in terms of the preservation of equality. **P7.4** Demonstrate an understanding of linear equations of the form $x + a = b$ (where a and b are integers) by modeling problems as a linear equation and solving the problems concretely, pictorially, and symbolically.

Grade 8 Health Education: USC8.6 Examine and assess the concept of sustainability from many perspectives, and develop an understanding of its implications for the well-being of self, others, and the environment.

Mathematics: N8.3 Demonstrate understanding of rates, ratios, and proportional reasoning concretely, pictorially, and symbolically. **P8.2** Model and solve problems using linear equations of the form: $ax=b, x, a, =b, a \neq 0, ax+b=c, x, a, +b=c, a \neq 0, a(x+b)=c,$ concretely, pictorially, and symbolically, where $a, b,$ and c are integers.

SP8.1 Analyze the modes of displaying data and the reasonableness of conclusions.