

<b>Title of Lesson Plan</b>	Sustainable Choices
<b>Prepared By (first and last name)</b>	Samuel Northey
<b>City and State</b>	Circle Pines, MN
<b>Grade Level(s)</b>	9-12
<b>Keywords (subjects covered)</b>	Sources of wood, wood use, and relationship to energy consumption in a household.
<b>Brief Description</b>	The students will explore the energy use and construction methods of their home, what products are used not only on the surface but within the walls
<b>Total Time Required</b>	3-5 periods 45 min periods plus time spent with adults at home.
<b>Setting</b>	Classroom / home / computer lab
<b>Lesson Objectives/Goals</b>	To have the students look beyond the surface of their home, and see where they might make different choice that are more sound for the environment.
<b>Materials Needed</b>	Computers, Internet, Presentation media
<b>Standards Addressed</b>	

**Procedure**

**Home Heating Systems Project**

Due Jan. \_\_\_\_ (Friday after Winter Break). 5 pts bonus if you hand it in on Jan. \_\_\_\_ (Wednesday).

Maximum points: 40

**Information to be included**

Science Terms: **Convection, Conduction, Radiation, Insulation.**

**R-Value**

For each correct use of any of these words *in the body of your paper*, you will get 2 points, with a maximum of 8 points per word. You will not get points for writing the definition of the words at the end of your paper. You will not get those points if you misspell the word!

Heating Your Home

- 5 Type of primary heating system for your home, source of the energy (forced air, steam radiators, wood, etc), construction methods
- 15 Description of how the heating system functions. The more detail you include, the more points you can get. Correct use of SCIENCE TERMS (listed below) will earn you more points.
- 10 Comparison to some other common type of heating system- describe how the other type works, and explain how it is similar or different from yours.
- 5 Energy source for your heating system
- 5 Types of secondary heating sources (fire place, space heaters, oven, etc)
- 5 Energy sources for any secondary heating sources
- 5 What kind of thermostat do you have? What temperature is your thermostat set to? Do you change the setting at night? Why?

Keeping the heat energy inside

- 5 Type(s) of insulation/ construction above your living space (attic, roof, crawlspace). What does it look like? What is it made of?
- 5 R-value, thickness, type (cellulose) or related information for the insulation above your living space
- 5 type(s) of insulation in the outside walls: what is it made of? What does it look like?
- 5 R-value, thickness, or related information for the insulation in the walls.
- 5 How do you stop heat energy from leaving through the windows? (storm windows, double glass, heavy curtains, etc)  
Note: If you can't find out what is in your attic or walls, find out what the recommended thickness, R-value, and most common types are.

Paying for it

- 5 Find out how much your family pays for all utilities for an average winter month. You don't have to tell the exact \$, but you should know for your own sake.
- 5 Compare the cost in an average winter month with the cost in a month that doesn't require heating or cooling (Because most heating systems use electricity and something else, this comparison will give you an idea of what it costs just to heat the home.)

Suggestions for Improvement

- 10 Based on what you have seen in gathering information for this report, brainstorm with your parents some ideas that your family could use to reduce the amount of money spent on heating your home.

20 Sources

You must have sources of information for your paper *other than yourself*. To get full points, you must have 5 or more sources.

Your sources must be cited at the end of the paper, *in MLA format*.

**Format: Written Paper/ class presentation**

The information above must be written in sensible paragraphs to make a well-structured paper. Write like your English teacher was going to read it: use formal English (don't use 'cuz', 'thru', 'well, it's like...') proofread it, spell check it, get someone else to proofread it, and revise it. Also, **YOU MUST CITE YOUR SOURCES**.

**Grading**

Maximum points possible: 160, but it will be recorded out of 130 pts, so you don't have to find everything to get an A, but you do need to do a good job.

Your grade will be determined by adding up all the points for information, and then subtracting as follows:

- ½ pt for each misspelled word, wrong word, or mis-capitalized word. (proofread!)
- 1 pt for each sentence fragment or run-on sentence
- 1 pt for each improper use of grammar, structure, or punctuation.

If you type your paper, use 10- or 12-point font (no larger), and double-space your lines. If you hand-write your paper, please double-space the lines, and write as neatly as you can.

There is no assigned length, but if you finish your paper in only one page, you probably haven't written enough to cover the subject completely. Typically, a really good paper is **2-4 pages** long (typed, double spaced).

**Heating Systems Project Rubric**

5 pts bonus for Early

<u># Points</u>	<u>Heating Your Home</u>
____ (5)	type of primary heating system for your home
____ (15)	description of how it functions. 15 pts for complete, detailed, correct (4-6 sentences) 12 pts for complete but not detailed, correct (3-4 sentences) 10 pts for brief , but correct (2-3 sentences) 5 pts for very brief but correct (1-2 sentences) -2 pts for each technical error
____ (10)	comparison to some other common type of heating system 6 pts for description of some other type- complete, detailed, correct 4 pts for description of other type, complete, little detail, correct 2 pts for description, brief but correct 4pts for detailed comparison – at least 2 points of comparison 2 pts for comparison- only 1 point of comparison -2 pts for each technical error
____ (5)	energy source for your heating system 5 pts for complete description- substance, source 4 pts for listing substance but not source.
____ (5)	types of secondary heating sources (fire place, space heaters, oven, etc)
____ (5)	energy sources for any secondary heating sources 5 pts for complete description- substance, source 4 pts for listing substance but not source
____ (5)	thermostat 5 pts –type, setting, reasons 4 pts – 2 of : type, setting, reasons 3 pts – 1 of : type, setting, reason

	<p><b># Points</b> <u>Keeping the heat energy inside</u></p> <p>____(5) What is the composition of the walls, floors, and roof of the home?</p> <p>____(5) type(s) of insulation above your living space: what is it made of? What does it look like?</p> <p>____(5) R-value, thickness, and description  5 pts – 3 of (description, R-value, thickness)  3 pts- 2 of (description, R-value, thickness)  2 pts – 1 of (description, R-value, thickness)</p> <p>____(5) type(s) of insulation in the exterior walls: what is it made of? What does it look like?</p> <p>____(5) R-value, thickness, and description  5 pts- 3 of (description, R-value, thickness)  3 pts – 2 of (description, R-value, thickness)  2 pts – 1 of (description, R-value, thickness)</p> <p>____(5) Windows  5 pts – description of windows, curtains, etc.  4 pts – minimal description</p> <p>____(5) Cost in winter</p> <p>____(5) Compare the cost with summer or spring</p> <p>____(10) Improvement  10pts for (3+ minor changes) or (2 major changes) or (1 major and 1-2 minor)  8 pts for (2 minor changes) or (1 major change)  5 pts for 1 minor change</p> <p><b># Points</b> <u>Science Terms:</u></p> <p>____(8) Convection                      ____ (8) Radiation ____ (8) Insulation</p> <p>____(8) Conduction                      ____ (8) R-Value</p> <p><b># Points</b> <u>Sources &amp; Citation:</u></p> <p>____ (10) Number of Sources  10 pts for 5 or more sources  8 pts for 4 sources  5 pts for 3  3 pts for 2 sources  1 pt for 1 source</p> <p>____ (10) Format for Citations  10pts for correct MLA style citations for all sources  8 pts for mostly correct MLA, or all correct but 1  6 pts for attempt at MLA, but several mistakes  0 pts for unformatted list of people, web sites, etc.</p> <p><b># Points</b> <u>Deductions:</u></p> <p>_____ x ½ = _____ for misspellings</p> <p>_____ x 1pt = _____ each sentence fragment</p> <p>_____ x 1pt = _____ improper use of grammar, punctuation, and structure</p>
<b>Assessment</b>	The presentation/ Paper
<b>Literature Cited/References</b>	Based on a lesson developed by Jameson, Yankee, and Northey at Deforest High school.
<b>Forestry Tour Attended</b>	Duluth, MN 2009

**Lesson Plan Disclaimer**

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