Science Grade 7 **NAME:_____ Class:__**

Chapter 6 **/50** **Heat Pumps: An Alternate Way to Heat Homes**

Appendix A

1. Historically, identify **three** sources of heat used in Newfoundland and Labrador. (3)

(i)_____

(ii)_____

(iii)_____

WOOD

2. **If I cut my own wood**, in the future, will there be places available in my town or province so I can cut it? **YES or NO.** (circle one) (1)

Explain your choice_____

_____

B) What will happen to the cost of wood in the future? Why? (1)

_____

3. Identify three POSITIVE THINGS about burning wood as a fuel source. (3)

(i)_____

(ii)_____

(iii)_____

4. Identify four NEGATIVE THINGS about burning wood as a fuel source. (4)

(i)_____

(ii)_____

(iii)_____

(iv)_____

OIL

5. In the statement, **CIRCLE** your choice. E**xplain your statement in the last column. (5)**

TOPIC	Statement	Explanation …WHY?
Cost of oil in the future	In the future, the cost of oil will (go down, go up, remain the same)	
Space used in my house for an oil furnace and ductwork	The space in my house(decreases, increases, remains the same) if I have an oil furnance installed	
Environmental concerns about spills and leaks in pipelines	There are (zero, many) environmental concerns from spills and leaks in pipelines.	
The effects of green house gases I produced by burning oil	There are(no, many) effects of green house gases from burning oil as a heat source.	
Is there enough oil supply for the future?	There (IS, IS NOT) enough oil to supply us in the future.	

ELECTRICITY

6. Identify three ways electricity can be created. (3)

(i)_____

(ii)_____

(iii)_____

7. Identify three POSITIVE THINGS about using electricity as a fuel source. (3)

(i)_____

(ii)_____

(iii)_____

8. Identify three NEGATIVE THINGS about using electricity as a fuel source. (3)

(i)_____

(ii)_____

(iii)_____

9. Will there be enough electricity in the future? **YES or NO.** (circle one) (1)

Explain._____

_____

10. A) If you were building a house, which source of fuel source would you choose:

wood; oil or electricity? (CIRCLE ONE)

WHY?_ (1) _____

_____

B) **Converting from one fuel source to another** is <u>not always possible</u> and can be **quite expensive**. Explain:

(i) CONVERTING NOT POSSIBLE: (1)

_____

_____

(ii)EXPENSIVE: (1)

_____

_____

11. For each new technology to transfer heat, create a diagram and explain how it is used.(4)

A) Use a diagram and explain how an air-to-air heat pump is used to WARM.

B) Use a diagram to show how an air-to-air heat pump is used to COOL.

C) Use a diagram to show how an air-to-water heat pump is used to WARM a house.

D) Use a diagram and explain how a ground source heat pump is used to COOL a house.

12. In a ground source heating system, what are three things the length and depth of the underground piping must depend upon: (3)

(i)_____

(ii)_____

(iii)_____

13. A _____ is an electrical device that moves from one source " concentrates" it, then transfers it to another location. (1)

14. Identity THREE positive features of using HEAT PUMPS in your home. (3)

(i)_____

(ii)_____

(iii)_____

Cost Comparision for Various Heat Sources

HEAT SOURCE Size of house: 3000 ft^2 Ave temp. range : -15°C to 25°C	INSTALLATION COST ($)	AVERAGE COST ($) PER MONTH	YEARLY COST ($)	COST ($) IN 10 YEARS
Electric Heat	2500	300	3600	36 000
Oil Furnace	5000	250	3000	30 000
Wood Furnace	5000	130	1560	15 600
Air-source Pump	12 000	120	1440	14 400
Ground-source Pump	25 000	60	720	7200

15. Using the **Cost Comparision for Various Heat Sources table** to answer the following questions:

    A) Identify THREE heat sources which have LOW Installation cost but cost you MORE per month to operate. (3)

    (i)_____

    (ii)_____

    (iii)_____

    B) Identify TWO heat sources which have HIGH Installation cost but cost you LESS per month to operate. (2)

    (i)_____

    (ii)_____

16. Identify TWO SIMILARITIES between AIR source and ground source heat pumps. (2)

    (i)_____

    (ii)_____

    B) Identify ONE DIFFERENCE between Air source and ground source heat pumps. (1)

(i)____