

**Please use this questionnaire to identify areas that might need attention  
and return it with the infrared thermometer.**

A detailed procedure for determining R-values is described in the NDSU Extension Service publication AE-1373 "Determining Insulation and Air Infiltration Levels Using an Infrared Thermometer."

These measurements work best when the difference between inside and outside air temperatures is large.

If you have questions, contact NDSU Extension Service energy educator Carl Pedersen  
at carl.pedersen@ndsu.edu or (701) 231-5833.

Name \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

Estimated Wind Speed \_\_\_\_\_ Outdoor Temperature \_\_\_\_\_

**Please answer as  
many questions  
as you can  
throughout the  
questionnaire**

**BASEMENT**

Is the basement wall or foundation insulated?     Yes     No     Not sure

If yes, is it insulated on the inside \_\_\_\_ or outside \_\_\_\_  
 - Amount of insulation \_\_\_\_\_ inches  
 - Type of insulation (fiberglass, rigid foam, etc.) \_\_\_\_\_

Are the rim joists (where the basement foundation meets the house framing, shown at right) insulated?  
 Yes     No     Not sure

Do you have any areas where plumbing, electrical or other penetrations are not sealed and insulated, indicated by a difference in temperature or visible air space?     Yes     No

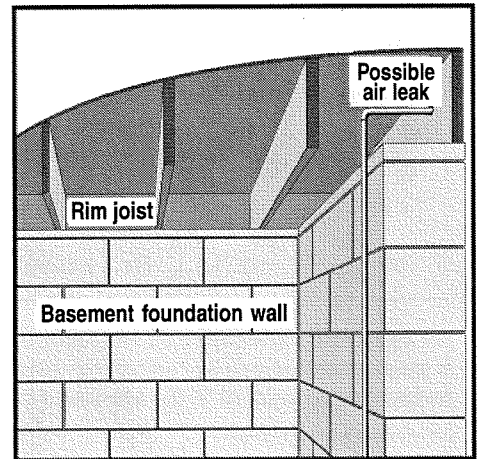
Are the basement windows single pane?     Yes     No

Do you have any air leaking around the window frames     Yes     No

What areas did you find that needed attention? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

What actions did you **take** to remedy any problem areas? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

What actions do you **plan** to remedy any problem areas? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**Department of Agricultural  
and Biosystems Engineering**

**NDSU**

**Extension Service**

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Fargo, North Dakota 58105

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# LIVING SPACE

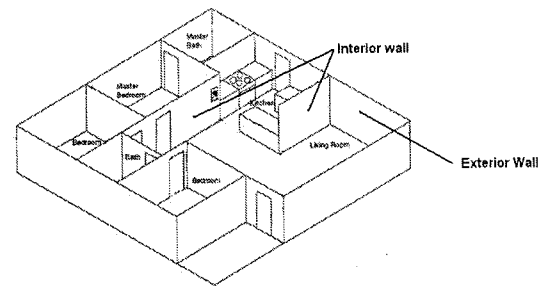
## Living Room

Use the procedure outlined in the infrared thermometer publication to determine the estimated wall insulation level and possible air leaks in the living room, then use the same basic procedure in each room in the house.

Interior wall temperature \_\_\_\_\_ Exterior wall temp \_\_\_\_\_ Estimated R-value \_\_\_\_\_

**Temperature difference between interior surface of an exterior wall and an interior wall surface for various outside temperatures and insulation values. Insulation R-values are estimates due to inaccuracies in the measuring device.**

	Estimated R-value								
	5	10	15	20	25	30	35	40	
Outside Temp (°F)	Temperature Difference °F								
40	4.1	2.0	1.4	1.0	0.8	0.7	0.6	0.5	
30	5.4	2.7	1.8	1.4	1.1	0.9	0.8	0.7	
20	6.8	3.4	2.3	1.7	1.4	1.1	1.0	0.8	
10	8.2	4.1	2.7	2.0	1.6	1.4	1.2	1.0	
0	9.5	4.8	3.2	2.4	1.9	1.6	1.4	1.2	
-10	10.9	5.4	3.6	2.7	2.2	1.8	1.6	1.4	
-20	12.2	6.1	4.1	3.1	2.4	2.0	1.7	1.5	
-30	13.6	6.8	4.5	3.4	2.7	2.3	1.9	1.7	
-40	15.0	7.5	5.0	3.7	3.0	2.5	2.1	1.9	



For example, if you measure the temperature of an exterior wall and the difference in temperature between that wall and an interior wall is 4 °F and the outside air temperature is minus 20 °F, the estimate of the level of insulation in that wall is R-15.

- Do you have small areas of exterior walls with differences in temperatures that could indicate no or failing insulation?  Yes  No
- Check for insulation levels in the ceilings that have unheated space above them, such as an attic or exterior roof. What is the estimated insulation level in the ceiling?  
– Ceiling R-value \_\_\_\_\_
- Do you have a temperature difference (indicating air leaking) around the windows?  Yes  No
- Do you have air leaking around outlet covers and light switches indicated by a temperature difference?  Yes  No
- Insulation levels often are lower and air often leaks around light fixtures, especially recessed lights. Do you have any temperature difference around light fixtures (that are off for several minutes before testing), indicating lack of insulation or leaking air?  Yes  No
- Do you have a temperature difference around exterior doors indicating air leakage?  Yes  No

*Now repeat the same procedure in each room in the house →*

## Family Room

- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

## Kitchen

- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

## Dining Room

- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

## Office

- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

## Master Bedroom

- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

## Bedroom

- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

## Bedroom

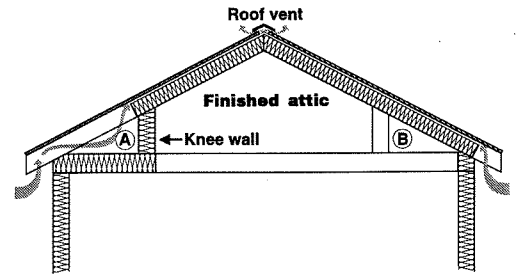
- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

## Other \_\_\_\_\_

- Estimated wall R-value \_\_\_\_\_
- Ceiling R-value \_\_\_\_\_
- Window air leaks       Yes     No
- Outlet air leaks         Yes     No
- Missing insulation       Yes     No
- Light fixture air leaks    Yes     No
- Exterior door leaks       Yes     No

# ATTIC

- What type of insulation is in the attic?  
 Fiberglass    Loose cellulose    Expanding foam    Other \_\_\_\_\_    None    Not sure
- Roughly how many inches of insulation do you have in the attic? \_\_\_\_\_
- Is the attic access (ladder, door or hatch) in a heated portion of the home?    Yes    No
- If yes, is the access insulated?    Yes    No
- Do you have a partially finished attic space?    Yes    No  
- If yes, are the knee walls insulated?    Yes    No
- Is air leaking around any heating, plumbing or electrical penetrations?    Yes    No
- What areas did you find that were in need of attention? \_\_\_\_\_



- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- What actions did you take to remedy any problem areas? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- What actions do you plan to remedy any problem areas? \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

# ADDITIONAL ITEMS

- What is the age of the home's heating source (furnace)? \_\_\_\_\_
- What fuel type does the furnace use?    Fuel oil    Propane    Natural gas    Electric  
 Other \_\_\_\_\_
- Are you using a programmable thermostat on your furnace?    Yes    No