



KY-A-Syst for the Home
Environmental Stewardship
for Homeowners

Heating and Cooling Systems: Saving Energy and Staying Safe

Teaching Guide

Introduction:

Heating and cooling your home economically and safely is important to any homeowner. Homes need to be tightly air-sealed and properly insulated, and all mechanical systems need to be working correctly. There are many things to take into consideration to make sure your system is efficient.

Combustion appliances need to be properly vented, and the vents and flues need to be checked annually. In addition, combustion equipment needs adequate air, either from outside the home or from indoor space where the appliance is located.

The amount of energy your home consumes depends on the quantity and quality of insulation, the efficiency of appliances, the local climate, and your lifestyle. If your primary heating and cooling unit is over 15 years old, it is probably not energy efficient. You may want to consider replacing it. Annual servicing is needed to maintain efficiency. Using a home energy manager that can be programmed for the entire week to regulate your thermostat is a simple way to save money. These devices typically pay for themselves in 1-2 years through energy savings.

Heat can be lost through uninsulated walls, floors, ceilings, ductwork, windows or doors. It is important to use insulation with the proper R-value for your location. Air leaks should be sealed with caulking or weather-stripping.

Water heaters also use large amounts of energy. There are several ways to reduce the cost. These include turning down the temperature, insulating the heater, and using less hot water. Low-flow showerheads conserve both energy and water, as do high efficiency washing machines.

Focus on Children:

As consumers use greater quantities of our natural resources, many of these resources may be in limited quantities for your children. Saving energy now means there will be more of the natural resources used to generate energy for your children.

Safe use of combustion appliances is essential for good air quality in the home. Children breathe in 50% to 100% more air for their size than adults do, so air pollution from combustion appliances will affect them more quickly and severely than adults.

Lesson Purpose and Objectives:

Purpose: This lesson is designed to assist people in saving energy and staying safe while heating and cooling their homes.

Objectives: This lesson guide contains a lot of information about how to heat and cool your home safely. It may be difficult to cover all the material in one session. Therefore, you are encouraged to select a program based on the type of audience you are serving and their needs. It is best to select and focus on *only two or three* of the following objectives.

Become knowledgeable about the proper venting systems for combustion appliances.

Realize your flue or chimney needs to be inspected annually and a record kept of its condition.

Know that combustion equipment must be located in a well-ventilated space and have adequate air for combustion.

Study how to determine the age and efficiency of your heating and cooling equipment, and how to change the filters.

Explore the advantages of a modern thermostat with a variable temperature program.

Understand the importance of sealing any leaks around windows, doors and ductwork, and insulating walls, ceilings and floors adequately.

Comprehend how much energy can be saved by lowering hot water temperature, insulating your water heater, and using low-flow shower heads.

Other (Please list in the space below):

Suggested Resources & Materials:

The following items are available for your use in teaching this lesson. Select and use resources according to your program focus and needs. County agents should request these items in advance.

Publications & Fact Sheets

Department of Energy Publications – web versions of the following fact sheets, as well as additional pieces related to energy efficiency, are available through the Energy Efficiency and Renewable Energy Clearinghouse at <http://www.eren.doe.gov/consumerinfo>. An order form can also be printed from this web site.

- *Energy Savers: Tips on Saving Energy & Money at Home*
- *Automatic and Programmable Thermostats*

Suggested Resources & Materials: (cont'd.)

Publications & Fact Sheets

Department of Energy Publications – (cont'd.)

- *Elements of an Energy-Efficient House*
- *Energy-Efficient Windows*
- *Insulation*
- *Weatherize Your Home – Caulk and Weather Strip*

Videos (Available through the Ag. Communications video library.)

- *Environmental Safety: What Every Parent Should Know* (VEI-1337)

Other: (Please specify below.)

Suggested Teaching Techniques and Activities:

Select only those activities that will help you teach the lesson. Limit selection according to your program focus, audience, and length of lesson.

- Use the transparencies to give an overview of heating, cooling, and energy saving issues and strategies. Encourage discussion as you present the information.
- Have the participants read the Ky-A-Syst for the Home publication *Heating and Cooling Systems: Saving Energy and Staying Safe*. Go back through the publication and have them answer the questions in the boxes. Suggest participants record all B and C responses and list changes they plan to make from information in the publication or from other sources. They can do this on the Action Checklist on Page 4. Encourage them to set target dates for taking action. Suggest that they review the checklist from time to time to see if any responses have changed.
- Have someone from the local utility company come in and speak about various methods of conserving energy. Ask them to discuss programmable thermostats, also referred to as home energy managers. These devices allow you to program different temperatures settings throughout the week.
- Do a demonstration on sealing leaks. Let participants caulk around a window or seal around a door with weather-stripping. Bring examples of various types of insulation with different R values so the audience can see how many materials are available.

Suggested Teaching Techniques and Activities: (cont'd.)

- Show participants how to turn down the temperature on their hot water heater. Have available a water heater insulation blanket and show them how to install one. Let the audience see a low-flow shower head.
- Tell participants ahead of time to total their monthly heating and cooling bills for an entire year. Help them calculate their average monthly energy bill. Let participants compare these averages so they can determine whether their home is using more energy than comparable homes.
- Other: (Please specify below.)

Suggested Evaluation Techniques:

Select the technique(s) best suited to the information you would like to obtain from your audience. Immediate evaluation will provide reaction to the presenter and program materials. Delayed evaluation will give a better indication of changed behavior and attitudes.

- ◆ At the close of the program, ask each participant to name *one* thing they learned from the lesson.
- ◆ At the end of the program, ask each participant to list something they will go home and do as a result of the lesson. Have them write the item on a piece of paper with their name and the date of the lesson. Save the papers and several weeks/months later survey the group to see if they actually did it.
- ◆ Hand out a copy of the *Help Us Serve You Better* evaluation form. Ask participants to complete the form and leave it in a specific place as they leave.
- ◆ Return to the group several weeks later and ask them to fill out the Follow-up Feedback Form and collect them as they leave. If you cannot return to the group in person, contact a representative number of the participants by phone and collect the data requested on the Follow-Up Feedback Form from each.
- ◆ Other: (Please specify below.)

Reporting Impacts (*Information for County Extension Agents*):

Use the following priority indicators and program accomplishment (PAC) codes when reporting impacts as a result of this program. Information taken from the FY01 PAC and priority indicators lists.

PAC Code 440 – Indicator:

- Number of persons who report practice changes related to safety.

PAC Code 510 - Indicator:

- Number of youth or adults who demonstrate informed and effective decision-making.

Prepared by Denise Hoffman, Temporary Extension Associate and Kim Henken, Extension Associate for Environmental and Natural Resource Issues.

This material was developed through funding provided by the U.S. Department of Agriculture, Cooperative State Research, Education and Extension Service, Healthy Homes Project and the U.S. Environmental Protection Agency, Region IV, Children's Environmental Health Project.

Educational programs of the Kentucky Cooperative Extension Service serve all people regardless of race, color, age, sex, religion, disability or national origin.

July 2001