

# The ENERGY STAR® Make A Cool Change: Recycle Your Old Fridge (or Freezer)

## NEED Teacher Guide



Developed by the NEED Project in cooperation with the  
Department of Energy and ENERGY STAR®



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# NEED Teacher Guide

## The ENERGY STAR® Make A Cool Change: Recycle Your Old Fridge (or Freezer) Campaign

### BACKGROUND

The ENERGY STAR® Make a Cool Change: Recycle Your Old Fridge (or Freezer) Campaign, formerly the Recycle My Old Fridge Campaign, provides an opportunity for students to share what they know about energy efficiency with their families and community, encouraging them to make a difference by recycling an old refrigerator or freezer and replacing it, if necessary, with an ENERGY STAR® qualified appliance. This teacher guide provides various campaign activity ideas to be used to strengthen students' knowledge about energy, energy efficiency and recycling, and to help students spread the word about the campaign.

This is the second year of a national refrigerator recycling effort. It is a national call to action led by the United States Department of Energy to encourage consumers to help change the world by taking one more important energy-saving step. This campaign aims to bring together retailers, manufacturers, energy efficiency program sponsors, recyclers, government officials, and consumers in a concerted effort to permanently remove old, inefficient refrigerators and freezers from the electrical supply grid and, when needed, replace them with new ENERGY STAR® qualified units. Key supporters of the campaign include leading refrigerator manufacturers, utilities, retailers, recyclers, non-profit organizations, government leaders, and others who will join together to promote and run refrigerator recycling programs in support of the nationwide effort.

### CONCEPTS

The biggest energy user in your kitchen is the refrigerator.

Replacing an old refrigerator saves energy and money.

Recycling an old refrigerator saves energy and natural resources.

### TIME

The campaign's primary timeframe is April through June, 2009.

Activities in this teacher guide will take varying amounts of time depending on level of involvement.

One week – five 45-minute class periods is recommended.

### PREPARATION

Read through the teacher guide and select the activities you believe will benefit your students and those that fit into the timeframe you have allotted.

## PART 1: THE TIME IS RIGHT - LEARN ABOUT ENERGY EFFICIENCY AND RECYCLING

### Activity 1: Learn About It

- Have students learn about energy, energy efficiency and conservation, electricity generation and consumption, and recycling by reading NEED's Energy Infobooks. Primary, elementary, intermediate and secondary reading levels are available. Visit [www.need.org/EnergyInfobooks.php](http://www.need.org/EnergyInfobooks.php) to download and copy background materials for students. Classroom sets of the Infobooks are available for purchase. Call NEED at 1-800-875-5029 for more information.
- Have students learn about the campaign by exploring the ENERGY STAR® campaign website, [www.energystar.gov/recycle](http://www.energystar.gov/recycle), and review the "Refrigerators and Freezers" section.

### **Activity 2: How Does Your Old Fridge Measure Up? (Freezers Can Also Be Used)**

- Make copies of the student worksheet on page 6.
- Have each student fill out the information about his/her appliance at home.
- Use class computers to complete the on-line section or have students complete this at home. The on-line section is on the ENERGY STAR® campaign website, [www.energystar.gov/recycle](http://www.energystar.gov/recycle), and review the “Refrigerators and Freezers” section.
- Work as a class to answer the math survey questions.
- Create a large line graph on chart paper with “number of years old” on the x-axis and “annual cost” on the y-axis. Have each student place a dot on the graph to represent his/her refrigerator. Then draw in a line to best represent the class data. Discuss with students what the line graph shows – that annual cost to run the unit increases as the age of the refrigerator increases.
- Create another large line graph on chart paper with “number of years old” on the x-axis and “kWh” on the y-axis. Have each student place a dot on the graph to represent his/her refrigerator. Then draw in a line to best represent the class data. Discuss with students what the line graph shows – that kWh used to run a refrigerator increases as the age of the refrigerator increases, which means the older an appliance is, the more energy it is using.

### **Activity 3: Reading EnergyGuide Labels and Comparing Appliances**

- Make copies of pages 7-8.
- Review the information on an EnergyGuide label with the class.
- Instruct the students to complete the data table. Discuss the payback period - the amount of time it takes before you begin to save money - and its importance when comparing appliances.

### **Activity 4: Fun Facts about Recycling**

- Have students go to the ENERGY STAR® campaign companion website, [www.RecycleMyOldFridge.com](http://www.RecycleMyOldFridge.com), and click on “recycle.” View the tutorial about refrigerator recycling. Instruct the students to write down the steps of the recycling process in their science notebooks.
- Make copies of the **Fun Facts for Old and New Refrigerators and Freezers** on page 5. Read with students.
- If students want Fun Facts tailored to your state, contact [appliancecampaign@energystar.gov](mailto:appliancecampaign@energystar.gov) for assistance.
- Have students design brochures about refrigerator or freezer recycling. Include fun facts about old and new refrigerators and freezers. Include information about the recycling process and benefits of recycling. Hold a class vote for the best brochure.

## **PART 2: SPREAD THE WORD – EDUCATE YOUR FAMILY AND COMMUNITY**

### **Step 1: Spread the Word at Home**

- Encourage students to brainstorm ways to share with their families what they have learned with the ENERGY STAR Make A Cool Change campaign. Each student should prepare a presentation and rehearse it, then deliver the message to his/her family. Include information about how to select an ENERGY STAR® qualified appliance. Finally, students should report back to the class on their families’ reactions. Did any family agree to recycle and replace its old refrigerator or freezer?
- Instruct the students to complete the **How Does Your Old Fridge (or Freezer) Measure Up?** activity with their families. Have them find the information about their fridges (or freezers), enter the information on-line, and discuss the results.
- Instruct the students to become Energy Saving Detectives by enlisting the help of their families to answer the questions on page 9.

## Step 2: Spread the Word in the Community Suggested Activities

- Make copies of the brochure the class voted was the best from **Part 1 Activity 4: Fun Facts About Recycling**. Send a copy of the brochure home with all students to share with their families.
- Have students write and illustrate picture books about an old refrigerator or freezer that is replaced and recycled. Share the stories by reading to primary classes or hosting a special public library reading hour.
- Design “Fun Facts of Recycling” posters and hang in local businesses, such as appliance retailers.
- Have student groups create and shoot videos about their experience with the campaign. Have a premier party inviting the school community to watch the videos students created.
- Art Deco Fridge or Freezer - Make copies of the picture on page 10. Have students brainstorm and choose a theme, such as, “Save our Earth – Recycle.” Allow students to decorate their fridges or freezers, conveying the theme, however they like. Write an energy related fact about refrigerators or freezers across the top of the page. Get permission to hang pictures in a public space, such as the library, a grocery store or home appliance store.
- Make a presentation about the campaign at an assembly or Parent Teacher meeting (PTA, PTSA, etc.).
- During an open house, science night, or sporting event, set up a student-run display table. Prepare a display with fun and informative facts about the ENERGY STAR Make A Cool Change; Recycle Your Old Fridge (or Freezer) campaign, such as how refrigerators and freezers are recycled, and make sure your students are prepared to answer questions.
- Take a tour of your school and find areas where the school could be saving money on energy costs. How many refrigerators and freezers are there in your building? How old are they? Write a proposal to your principal with suggestions for replacing old appliances with ENERGY STAR® qualified models. Include information on how much money the school will save on its utility bills.
- Write and perform local radio and cable public service announcements.
- Design door hangers or postcards with energy saving tips and recycling facts and distribute in the community.
- Take a field trip to the local appliance recycling center, or invite the recycling center manager to visit your class to better learn what happens to recycled appliances.



# Fun Facts for Old and New Refrigerators

## Recycling your old fridge:

- Saves enough energy to light ten 13-watt ENERGY STAR® qualified light bulbs, one after another, for 70 years.
- Saves enough energy this year to freeze ice cubes in a new ENERGY STAR® fridge for more than 2 years.

## Electricity Savings

If everyone who purchases a new refrigerator in 2008 chooses an ENERGY STAR® qualified model instead of a non-qualified model, consumers will save enough energy to:

- Light every household in Washington, DC for over a year and a half.
- Power an ENERGY STAR® qualified 32" high definition LCD screen television for 570,000 years of non-stop viewing.
- Launch the space shuttle into orbit 260 times.
- Equal the amount of energy generated by burning 22 million gallons of gasoline.

## Dollar Savings

If everyone who purchases a new refrigerator in 2008 chooses an ENERGY STAR® qualified model instead of a non-qualified model, together, consumers will save:

- Over \$81.2 million each year in energy bills, or about \$7.15 per refrigerator.
- More than \$1.13 billion in energy bills, or about \$100 per refrigerator, over the lifetime of the average unit.

If every American home replaced their old refrigerators and freezers with ENERGY STAR qualified models, together, we would save...

- Enough energy to light more than 8.3 million homes for an entire year.
- Nearly \$1.8 billion in annual energy costs.
- Prevent annual greenhouse gases emissions of nearly 2.1 million cars, or nearly 1% of all registered automobiles in the United States. That is more than the number of registered autos in the entire state of Connecticut. Lined up bumper to bumper, those cars would stretch from New York to Los Angeles and back.

## Savings from Recycling

- The average refrigerator aged 10 years or older contains about 123 pounds of steel. Recycling this steel saves energy and natural resources that would have been used to produce steel from new materials. The energy saved by recycling this steel is over 287 kW of electricity.
- Therefore, recycling an average refrigerator aged 10 years or older saves enough energy to light a 13-watt ENERGY STAR® qualified compact fluorescent light bulb for over two and a half years.
- Recycling one ton of steel, about the amount of steel in 16 full-size refrigerators, conserves 2,500 pounds of iron ore, 1,400 pounds of coal, and 120 pounds of limestone.

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

## How Does Your Old Fridge or Freezer Measure Up?

1. Look inside your home refrigerator or freezer to find the following information:

This unit was made by: \_\_\_\_\_

The model number is: \_\_\_\_\_

Year manufactured: \_\_\_\_\_

2. Go to ENERGY STAR®'s campaign website, [www.energystar.gov/Recycle](http://www.energystar.gov/Recycle). Click on "Find out how much energy and money your old fridge or freezer is costing you!" Enter the information you collected.

Write your Information Results here:

Annual cost: \_\_\_\_\_

Annual kWh: \_\_\_\_\_

How much will your family save over five years by replacing your old refrigerator or freezer with a new ENERGY STAR® qualified model? \_\_\_\_\_

### Work as a class to answer the following questions:

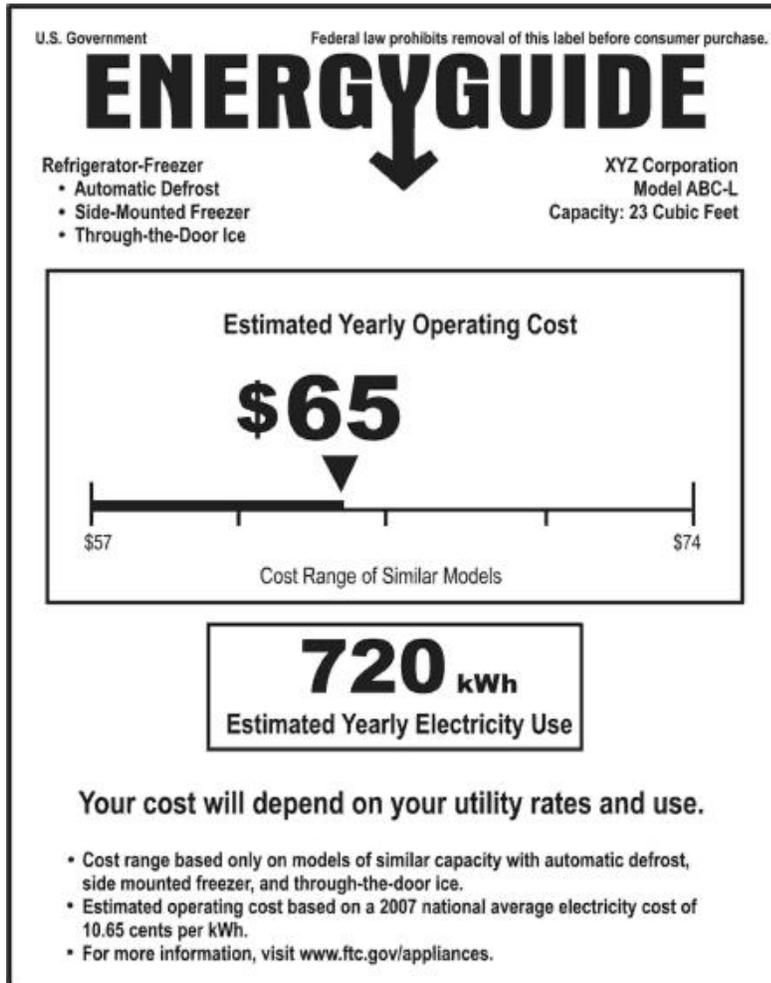
1. How many people in the class have a refrigerator or freezer that is 1-5 years old? \_\_\_\_\_
2. How many people in the class have a refrigerator or freezer that is 6-10 years old? \_\_\_\_\_
3. How many people in the class have a refrigerator or freezer that is more than 10 years old? \_\_\_\_\_
4. How many kWh of electricity do all the refrigerators or freezers in your class use per year? \_\_\_\_\_
5. How much money does it cost to run these refrigerators or freezer per year? \_\_\_\_\_
6. How much money would your entire class save over five years if everyone replaced their inefficient refrigerators and freezers with new ENERGY STAR® qualified models? \_\_\_\_\_

## Reading EnergyGuide Labels

Big appliances—like refrigerators, freezers, clothes washers, and dishwashers—use a lot of energy in homes, schools, and businesses. Some appliances cost more than others to buy. Some appliances use more energy than others. Usually, the more expensive models use less energy than the cheaper ones.

All appliances must have an EnergyGuide label that tells shoppers how much energy it uses. This way, people can compare the life cycle cost of the appliances, as well as the purchase price. The life cycle cost of an appliance is the purchase price plus the energy cost over the life of the appliance. An energy-saving refrigerator or freezer might cost more to buy, but it would use a lot less energy than a cheaper model.

The law requires EnergyGuide labels on all new refrigerators, freezers, water heaters, dishwashers, clothes washers, air conditioners, and furnaces. The EnergyGuide labels list the manufacturer, the model, the capacity, the features, the amount of energy the appliance will use a year, its comparison with similar models, and the estimated yearly energy cost.



# Comparing Refrigerators

You've convinced your parents to buy a new refrigerator or freezer to replace the old energy hog in your kitchen. Your parents are considering two models—you need to help them choose the better one. Refrigerators and freezers usually last a long time—10 to 20 years—so you can save a lot of money on an energy-efficient one. Use the chart below to calculate which refrigerator to buy.

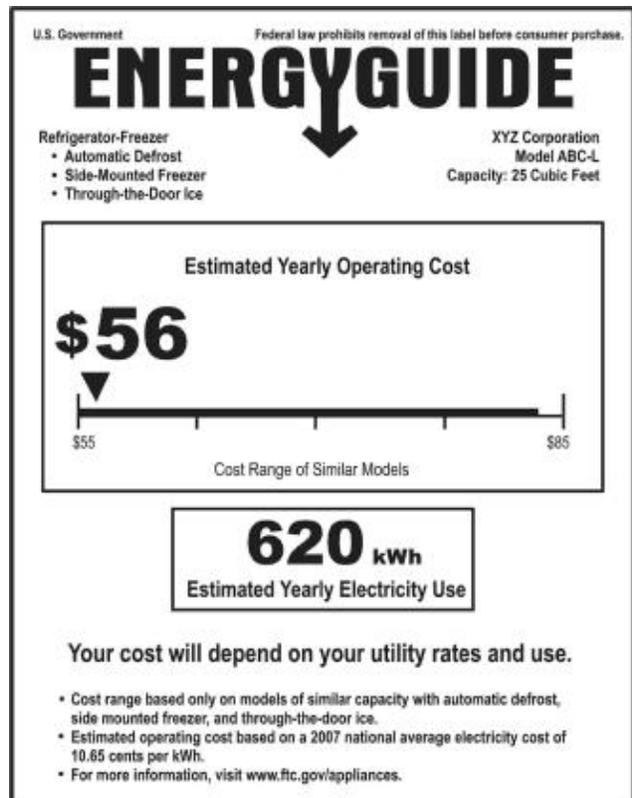
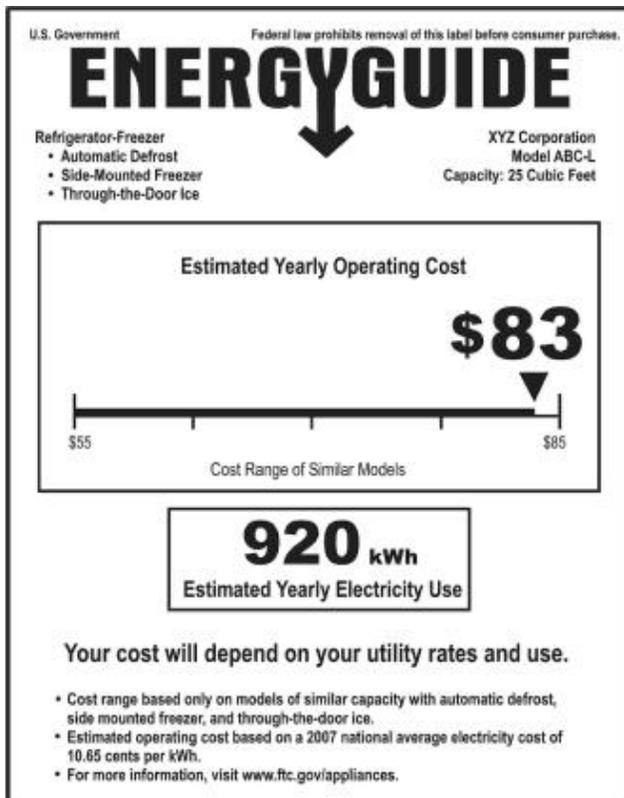
How many years will it take before you begin to save money?

How much money will you have saved after eight years?

**Refrigerator 1: \$900**

**Refrigerator 2: \$1,000**

Model 1	Expenses	Cost to Date	Model 2	Expenses	Cost to Date
Purchase Price			Purchase Price		
Year One			Year One		
Year Two			Year Two		
Year Three			Year Three		
Year Four			Year Four		
Year Five			Year Five		
Year Six			Year Six		
Year Seven			Year Seven		
Year Eight			Year Eight		



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

## Spread the Word at Home Be an Energy Saving Detective

Enlist the help of your family to answer the following questions about your refrigerator.

1. What is the refrigerator thermostat set at? \_\_\_\_\_ Is it between 36-38°F? \_\_\_\_\_
2. What is the freezer thermostat set at? \_\_\_\_\_ Is it between x-x°F? \_\_\_\_\_
2. Are the seals tight? (A closed door should hold a dollar bill in place.) \_\_\_\_\_
3. Is the freezer full? \_\_\_\_\_
4. Can air circulate freely around the fridge? \_\_\_\_\_
5. Is the top free of clutter? \_\_\_\_\_
6. Are the coils free of dust? \_\_\_\_\_

**If you answered "no" to any of these questions, work with your family to fix the energy wasting problem into an energy saver.**

7. Did you find any energy wasters? \_\_\_\_\_

8. Explain what you and your family did to correct the problem.

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