

Activity 1: Refrigerator Analysis

Name: _____ Date: _____

Energy Monitor Installation Steps:

1. Unplug the refrigerator from the wall (you may need to pull the refrigerator out towards you from its "nook", ask your parents for help if necessary)
 2. Plug the energy monitor into the outlet where the refrigerator was plugged in
 3. Plug the refrigerator into the outlet on the energy monitor immediately
 4. Pull the display and place it so that it is accessible and easy to view
- Put the refrigerator back to its original position

Part I.

Make sure your refrigerator has been plugged into the energy monitor for at least 24 hours before gathering the data below. Make sure your Bright Students refrigerator and freezer cards are properly installed in your refrigerator and freezer and have been installed for at least 24 hours. Gather the data below:

1. How much energy (kWh) has the refrigerator used in the past day?
2. How much energy (kWh) will the refrigerator use in a month? In a year?
3. At \$.11/kWh, how much will it cost (\$) to run the refrigerator for one day? One month? One year?

Activity 1: Refrigerator Analysis *(Continued)*

4. What is your refrigerator and freezer's current temperature?
5. On which numbers are your refrigerator and freezer dials? (most refrigerators have dials or buttons with numbers 1-9 or 1-5 to adjust the temperature)
6. Graph your monthly data on graph paper. Remember to graph both the energy use (kWh) on the left-hand y-axis and the energy cost (\$) on the right-hand y-axis.

Part II.

If your refrigerator is already set to 37-40 degrees and your freezer is set to 0-5 degrees, you do not need to do Part II and you may skip directly to Part III. If your answer to question #4 from Part I is less than 37-40 (refrigerator) and less than 0-5 (freezer), do the following: adjust your refrigerator and freezer warmer by two numbers on the dial (example: if your refrigerator is set to "7", adjust it to "5"). Wait 24 hours after adjusting the dials before gathering the data below.

1. How much energy (kWh) has the refrigerator used in the past day?
2. How much energy (kWh) will the refrigerator use in a month? In a year?
3. At \$.11/kWh, how much will it cost (\$) to run the refrigerator for one day? One month? One year?

Activity 1: Refrigerator Analysis *(Continued)*

4. What is your refrigerator and freezer's new temperature? What is the temperature difference between the original temperature setting and the new one?

5. What is the daily, monthly, and annual energy (kWh) difference between the new temperature settings and the original ones from Part I?

6. Graph your monthly data on the same graph paper on which you graphed your original refrigerator data. Use a different color for this new set of data. Remember to graph both the energy use (kWh) on the left-hand y-axis and the energy cost (\$) on the right-hand y-axis.

7. If your refrigerator is still not yet set between 37-40 degrees and your freezer not yet set between 0-5 degrees, repeat Part II (adjusting the dials, waiting 24 hours, and checking the temperature) until your refrigerator is set to 37-40 degrees and your freezer to 0-5 degrees.

8. Optional: For each temperature adjustment, continue to take daily, monthly, and annual readings for both energy use (kWh) and energy cost (\$) and graph this data.

Activity 1: Refrigerator Analysis *(Continued)*

Part III: General Refrigerator Questions:

1. Figure out how old your refrigerator is and write it in the space below. You can ask your parents if they know. Or you can find the model number and serial number (these are on a sticker on the inside of the refrigerator) and go to the following website: <http://www.appliance411.com/service/date-code.php>
2. A typical new refrigerator uses approximately 490 kWh annually and costs about \$700. If your family purchased a new refrigerator, how much energy (kWh) and money (\$) would your family save over the current refrigerator in one year? Five years? Ten years?

HELPFUL TIP! Use your Bright Students refrigerator and freezer thermometer cards to make sure your fridge and freezer are set to the ideal temperature. Refrigerators should be between 37-40 degrees and freezers should be between 0-5 degrees. Refrigerators and freezers that are set too low waste considerable amounts of energy.

Activity 2: Analyzing the Energy Use of Other Household Appliances/Devices

Name: _____ Date: _____

Energy Monitor Installation Steps:

1. Plug the energy monitor into an outlet
2. Plug the device you are testing into the energy monitor
3. Pull the display and place it so that it is accessible and easy to view

Part I: Gathering device/appliance data

Appliance/Device: Box Freezer Data:

Note: This only applies to families who have a separate box freezer. Make sure your box freezer has been plugged in for at least 24 hours before taking measurements. Be sure to plug the box freezer into the energy monitor immediately as quickly as possible.

1. How much energy (kWh) has the freezer used in the past day?
2. How much energy (kWh) will the freezer use in a month? In a year?
3. At \$.11/kWh, how much will it cost (\$) to run the freezer for one day? One month? One year?

Activity 2: Analyzing the Energy Use of Other Household Appliances/Devices *(Continued)*

4. Figure out how old your box freezer is and write it in the space below. You can ask your parents if they know. Or you can find the model number and serial number (these are on a sticker on the inside of the box freezer) and go to the following website: <http://www.appliance411.com/service/date-code.php>
5. A typical new box freezer uses approximately 430 kWh annually (manual defrost) and costs about \$600. If your family purchased a new box freezer, how much energy and money would your family save over the current box freezer in one year? Five years? Ten years?
6. Remember! Use your Bright Students freezer thermometer cards to make sure your box freezer is set to the ideal temperature. Separate box freezers (not freezers attached to refrigerators) should be set between -5-0 degrees.

Activity 2: Analyzing the Energy Use of Other Household Appliances/Devices *(Continued)*

Dishwasher:

Note: Most dishwashers plug into the wall somewhere below the sink. Find the outlet and follow the steps for using the energy monitor described at the top of the activity.

1. How much energy (kWh) has the dishwasher used in the past day?
2. How much energy (kWh) will the dishwasher use in a month? In a year?
3. At \$.11/kWh, how much will it cost (\$) to run the dishwasher for one day? One month? One year?
4. Figure out how old your dishwasher is and write it in the space below. You can ask your parents if they know. Or you can find the model number and serial number (these are on a sticker on the inside of the dishwasher door) and go to the following website: <http://www.appliance411.com/service/date-code.php>
5. A typical new dishwasher uses approximately 300 kWh annually and costs about \$600. If your family purchased a new dishwasher, how much energy and money would your family save over the current dishwasher in one year? Five years? Ten years?

HELPFUL TIP! Another advantage of using a newer dishwasher is that they save significant amounts of water (including the energy needed to heat the water) compared to older dishwashers! Remember to only run your dishwasher when it is full!

Activity 2: Analyzing the Energy Use of Other Household Appliances/Devices *(Continued)*

Home Office Data

Note: All families have different ways of configuring their home offices/computer areas. For this activity, the goal is to determine how much energy the entire home office (computer, monitor, printer, speakers, etc.) uses. The easiest way to do this is to have all devices plugged into a power strip, and then to plug the power strip into the energy monitor, which will be plugged into the wall.

1. How much energy (kWh) has the home office used in the past day?
2. How much energy (kWh) will the home office use in a month? In a year?
3. At \$.11/kWh, how much will it cost (\$) to run the home office for one day? One month? One year?
4. Does your family power down the computer, monitor, and other devices at night or when everyone is out of the house for long periods of time?
5. Are there items that are plugged in and always or usually "on" that don't need to be, such as a printer, speakers, etc.?

HELPFUL TIP! Use a smart power strip for maximum savings. Smart power strips cost between \$20-\$30 and will pay for themselves with energy savings within one year!

Activity 2: Analyzing the Energy Use of Other Household Appliances/Devices *(Continued)*

Other Devices as Applicable (optional). Fill in any parts of the table below that are applicable to you and your family:

Measure	Electric Heater	Dehumidifier	Microwave	Television
kWh/Day				
kWh/Month				
kWh/Year				
\$/Day				
\$/Month				
\$/Year				

Part II.

Select three devices/appliances for which you've gathered data in the table above and graph the results on graph paper. Graph the **monthly** data. Remember to graph both the energy use (kWh) on the left-hand y-axis and the energy cost (\$) on the right-hand y-axis.