

# **ENERGY EFFICIENCY SAVES MONEY**

Adapted from "How Many Light Bulbs Does it Take to Change a People," a Collaborative Project between the New England Electric System and the Conservation Law Foundation

**Overview/Objective:** Students will calculate and compare the lifetime cost of an efficient refrigerator versus an inefficient refrigerator.

**Time:** 1 hour

**Subject:** Math

**Suggested Grade Level:** 4 – 5

**Materials:** Student Worksheet (provided below)

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## **PROCEDURE**

The effects of an energy conservation effort can be quite dramatic when presented numerically in terms of fuel savings, electricity savings, dollar savings, or environmental impact. The calculations in this activity require only simple arithmetic. This activity illustrates the value of conservation and provides good math practice.

Refrigerator #1 costs \$500 and uses \$100 worth of electricity each year. Refrigerator #2 (which is more energy efficient) costs \$600 and uses \$75 worth of electricity each year.

1. At the end of the *first* year, how much will Refrigerator #1 have cost?

*Cost of refrigerator + cost of electricity = **\$600***

2. How much will Refrigerator #2 have cost?

*Cost of refrigerator + cost of electricity = **\$675***

3. At the end of the *second* year, how much will Refrigerator #1 have cost?

*Cost of refrigerator + cost of electricity for year 2 = **\$700***

4. How much will Refrigerator #2 have cost?

*Cost of refrigerator + cost of electricity for year 2 = **\$750***

Both refrigerators should last for 15 years. You can easily calculate how much each refrigerator will cost for its entire lifetime.

## Conservation Saves Money

<u>Refrigerator #1</u>	<u>Refrigerator #2</u>
Cost = \$500	Cost = \$600
Operating Cost = \$100/year	Operating Cost = \$75/year
Total Cost after:	Total Cost after:
Year 1 <u>\$600</u>	Year 1 <u>\$675</u>
Year 2 <u>\$700</u>	Year 2 <u>\$750</u>
Year 3 <u>\$800</u>	Year 3 <u>\$825</u>
Year 4 <u>\$900</u>	Year 4 <u>\$900</u>
Year 5 <u>\$1000</u>	Year 5 <u>\$975</u>
Year 6 <u>\$1100</u>	Year 6 <u>\$1050</u>
Year 7 <u>\$1200</u>	Year 7 <u>\$1125</u>
Year 8 <u>\$1300</u>	Year 8 <u>\$1200</u>
Year 9 <u>\$1400</u>	Year 9 <u>\$1275</u>
Year 10 <u>\$1500</u>	Year 10 <u>\$1350</u>
Year 11 <u>\$1600</u>	Year 11 <u>\$1425</u>
Year 12 <u>\$1700</u>	Year 12 <u>\$1500</u>
Year 13 <u>\$1800</u>	Year 13 <u>\$1575</u>
Year 14 <u>\$1900</u>	Year 14 <u>\$1650</u>
Year 15 <u>\$2000</u>	Year 15 <u>\$1725</u>

Which refrigerator really costs more? #1

How much did the higher purchase price refrigerator save during its lifetime? \$275

### EXTENSION

Have students create a line graph representing the total cost of the fridges over 15 years. Use a different color line for each fridge.

## Energy Efficiency Saves Money

Refrigerator #1 costs \$500 and uses \$100 worth of electricity each year. Refrigerator #2 (which is more energy efficient) costs \$600 and uses \$75 worth of electricity each year.

1. At the end of the *first* year, how much will Refrigerator #1 have cost?

*Cost of refrigerator + cost of electricity = \_\_\_\_\_*

2. How much will Refrigerator #2 have cost?

*Cost of refrigerator + cost of electricity = \_\_\_\_\_*

3. At the end of the *second* year, how much will Refrigerator #1 have cost?

*Cost of refrigerator + cost of electricity for year 2 = \_\_\_\_\_*

4. How much will Refrigerator #2 have cost?

*Cost of refrigerator + cost of electricity for year 2 = \_\_\_\_\_*

Both refrigerators should last for 15 years. You can easily calculate how much each refrigerator will cost for its entire lifetime.

<u>Refrigerator #1</u>	<u>Refrigerator #2</u>
Cost = \$500	Cost = \$600
Operating Cost = \$100/year	Operating Cost = \$75/year
Total Cost after:	Total Cost after:
Year 1:	Year 1:
Year 2:	Year 2:
Year 3:	Year 3:
Year 4:	Year 4:
Year 5:	Year 5:
Year 6:	Year 6:
Year 7:	Year 7:
Year 8:	Year 8:
Year 9:	Year 9:
Year 10:	Year 10:
Year 11:	Year 11:
Year 12:	Year 12:
Year 13:	Year 13:
Year 14:	Year 14:
Year 15:	Year 15:

Which refrigerator really costs more? \_\_\_\_\_

How much did the higher purchase price refrigerator save during its lifetime? \_\_\_\_\_