

KETTLE EFFICIENCY ACTIVITY WORKSHEET



To understand the importance of energy efficiency we are going to complete a math problem.

In this activity we use the example of an electric kettle that is used every day to boil water. When full, the kettle uses 3 kWh to boil 1.75 liters of water in 6 minutes which is the same as 0.1 hour. First, we will calculate the energy consumption for a year of boiling a full kettle. You will need to know that the price of electricity in Nova Scotia per kilowatt hour is \$0.15 (15 cents)/kWh.

Then we will look at an energy efficient option. We don't need to boil a full kettle if we only need 2-3 cups of hot water. So, we assume that if we don't boil a full kettle, the energy used will decrease. If we fill the kettle to 70% full, we only require 70% of the electricity.

1. Calculate the annual cost to use a full kettle.

$$3 \text{ kWh} \times 0.1\text{h/day (6 minutes)} \times 365 \text{ days/year} = \underline{\hspace{2cm}} \text{ kWh/year}$$

$$\underline{\hspace{2cm}} \text{ kWh} \times \$0.15/\text{kWh} = \$ \underline{\hspace{2cm}} / \text{annual cost to boil a full kettle}$$

2. Calculate the annual cost to use a kettle that is only 70% full. An energy efficient option would be to only boil the water that is needed. We don't need to boil a full kettle for just 2-3 cups of hot water. So, we can assume that if we don't use a full kettle, it will decrease the energy used. If we fill the kettle to 70% full, we only require 70% of the electricity.

$$\underline{\hspace{2cm}} \text{ kWh/year used to boil full kettle} \times 0.7 \text{ (70\% full kettle)} = \underline{\hspace{2cm}} \text{ kWh/year}$$

$$\underline{\hspace{2cm}} \text{ kWh/year} \times \$0.15/\text{kWh} = \$ \underline{\hspace{2cm}} / \text{year (cost of efficient use)}$$

3. Calculate the energy savings!

$$\$ \underline{\hspace{2cm}} \text{ (annual cost to boil full kettle)} - \$ \underline{\hspace{2cm}} \text{ (efficient use cost)} = \$ \underline{\hspace{2cm}} / \text{year saved}$$

If you are more energy efficient when using your kettle by boiling 30% less water over the course of a year, you will save about \$ that year just on that one appliance!

4. What are other ways we can adjust our behaviour to reduce energy waste?
