

CHAPTER 10	Thought Lab 10.1: Improving Energy Efficiency at Home Answer Key	BLM 10.2.2A
ANSWER KEY		

Answers to Analysis Questions

1. Some of the possible energy-saving tips that you may list are shown below:

Category	Behaviour Changes	Technology
Space heating	<ul style="list-style-type: none"> Turn down the heat and wear warmer clothes. Turn down the heat at night and when not at home. 	<ul style="list-style-type: none"> Install a programmable thermostat to lower the heat at night and when you are not at home. Install an energy-efficient furnace. Install a furnace that burns natural gas instead of heating using electricity.
Water heating	<ul style="list-style-type: none"> Turn down the water heater to the recommended temperature. Take short showers instead of longer ones or baths. Wash clothes in warm or cold water instead of hot. Only run the dishwasher or washing machine with full loads. 	<ul style="list-style-type: none"> Replace your inefficient water heater with a more efficient one, or an in-line water heater. Install an insulating blanket around your water heater and pipes.
Appliances	<ul style="list-style-type: none"> Use the most efficient appliance for the job (don't use a conventional oven if you can use a microwave). Turn off the television and other appliances when not in the room. Turn off the computer and printer; don't just let them go into "sleep" mode, which still requires energy. Limit appliance use to when necessary. Use the oven to cook numerous items at one time. 	<ul style="list-style-type: none"> Buy ENERGY STAR® rated appliances.
Air conditioning	<ul style="list-style-type: none"> Turn up the temperature on the air conditioner to 25 °C. Sleep in the basement instead of using an air conditioner. 	<ul style="list-style-type: none"> Buy ENERGY STAR® rated air conditioners.
Lighting	<ul style="list-style-type: none"> Turn off the lights when not in the room. Light with natural light whenever possible. 	<ul style="list-style-type: none"> Use lower wattage bulbs. Buy more energy-efficient lightbulbs (compact fluorescents instead of incandescents).

CHAPTER 10	Thought Lab 10.1: Improving Energy Efficiency at Home Answer Key (continued)	BLM 10.2.2A
ANSWER KEY		

The behaviour-based tips have no inherent costs associated with them; however, you could mention a decrease in comfort level or having to wait longer to get the desired effect. To perform a cost-benefit analysis for the technology-based tips, you should consider the cost of implementing the tip versus the energy savings. See www.albertachemistry.ca for a list of some specific websites that provide information on energy savings. All energy-efficient models of appliances and light bulbs will lead to a net savings over the course of the appliance's lifetime; however, the initial outlay for the appliance is generally higher. For example, by replacing 12 incandescent bulbs with compact fluorescent bulbs, you would save approximately \$90 in a year. The initial cost of the 12 light bulbs, depending on where they are purchased, is approximately \$60, whereas purchasing the same number of incandescent bulbs is approximately \$12. In one year, the net savings would be $\$90 - \$60 + \$12 = \42 .

2. You could mention turning off lights when the room is not in use, purchasing more energy-efficient appliances, and perhaps finding more energy-efficient ways to heat and cool the school.
3. You may not support tips that would require a significant shift in behaviour, such as taking shorter showers and making less use of appliances such as the computer.

Answers to Extension Questions

4. Water can be conserved using a variety of technological and behaviour modifications. Changing shower heads to low-flow, replacing top loading washing machines with front loading, and buying low-flush toilets are all technological ways to conserve water. By taking showers instead of baths, turning off the taps while brushing your teeth, and by using the garbage can to dispose of tissues instead of flushing them are all behavioural ways to conserve water.