

HOME ENERGY ASSESSMENT KIT



DORVAL

TABLE OF CONTENTS

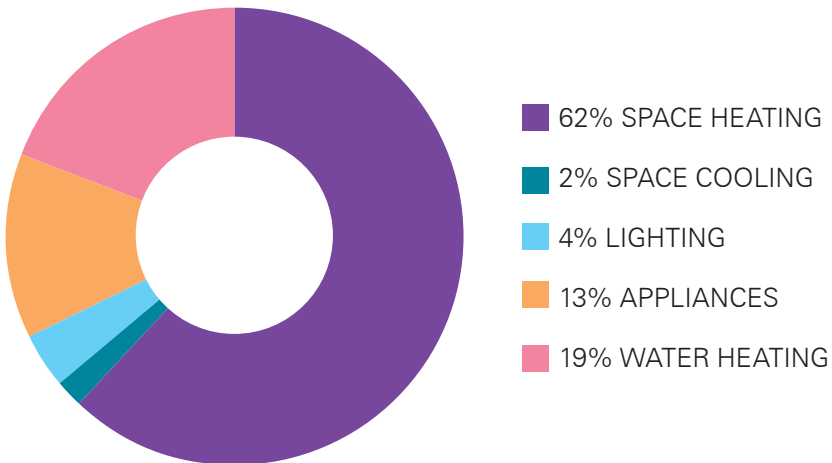
INTRODUCTION	1
TOOLKIT CONTENTS	3
HEATING AND COOLING	4
WATER	7
APPLIANCES	10
LIGHTING	13
INSTRUCTIONS	16
- ELECTRICITY USAGE MONITOR	16
- INFRARED THERMOMETER	17
- LIGHT METER	18
- STOPWATCH	19

INTRODUCTION

Let us begin by thanking you for borrowing this home energy evaluation kit. It provides tools, tests, and valuable information to help you better understand your home's energy consumption. The kit will also help you identify ways to save energy and money, while reducing your carbon footprint.

The chart below shows how energy is used in a typical Canadian home. Your home heating system is usually the biggest energy user, accounting for roughly 62% of your total home energy use. For the biggest savings, focus on reducing your heating demands. Also watch out for high energy-using appliances such as older refrigerators and freezers, hot tubs, heat lamps, and aquariums.

AVERAGE HOME ENERGY USAGE



Thanks to a few simple and cost-effective actions, you will get a clear picture of your energy consumption and make your home more environmentally-friendly, while reducing your impact on the environment, as well as the City's. Together, we can make a difference!

It is important to understand that using this Home Energy Toolkit is not equivalent to undergoing a home energy evaluation. An EnerGuide home energy evaluation is an extensive series of tests conducted by a trained professional that provides you with a rating and label for the total amount of energy your home uses in a year. By using this kit, you are simply doing your own assessment of your home's energy use to understand opportunities to conserve energy.

Before you start your assessment, it is recommended to learn about the EnerGuide home evaluation: nrcan.gc.ca/myenerguide.

NEED HELP?

If, at any point, you require help while using the Home Energy Toolkit or if you would like more advice about conserving home energy, please contact the City of Dorval's Environment Committee at **DorvalEnviro@ville.dorval.qc.ca**.



The City of Dorval wishes to express its gratitude to the City of Edmonton for sharing the original text for this guide.

TOOLKIT CONTENTS

Electricity Usage Monitor

Measures the energy demand of an electrical appliance.



Imaging IR (Infrared) Thermometer

Measures the temperature of areas, objects, and surfaces.



LED Lightbulb

Use with the electricity usage monitor to see the difference in energy use compared to a conventional incandescent or compact fluorescent lightbulb.



Light Meter

Measures the amount of light in a room.

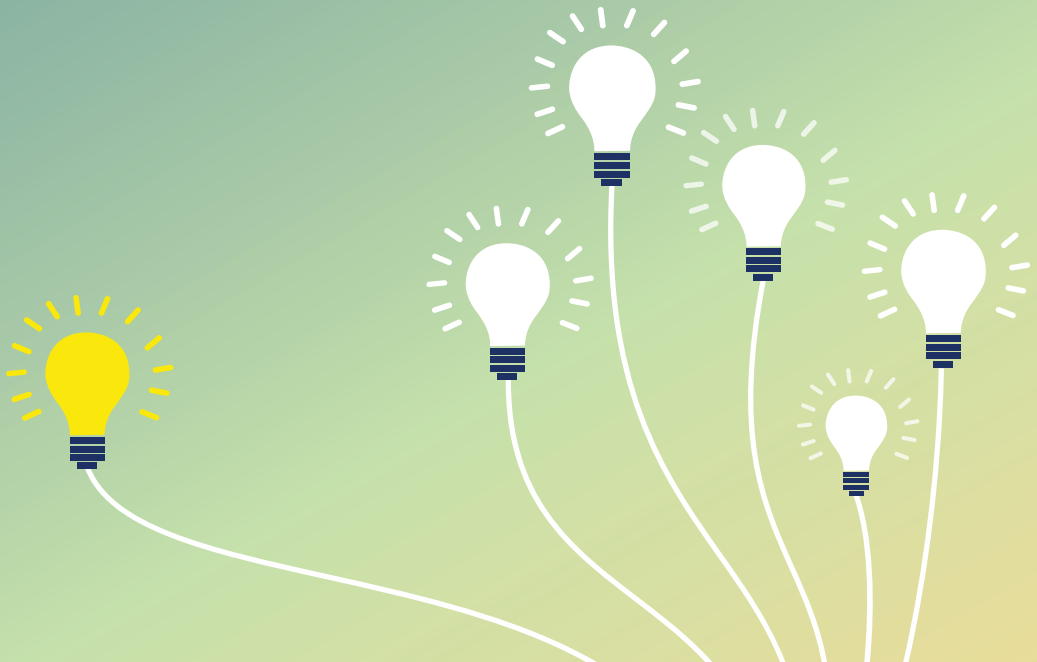


Stopwatch

Records accurate time for shower or tap flow rate test.



IT IS IMPORTANT THAT ALL ITEMS BE RETURNED WITH THE TOOLKIT.



HEATING AND COOLING

Energy used for heating and cooling can be saved by making physical upgrades to a house, like adding insulation and replacing windows. One can also decrease household heating and cooling energy use by making simple changes in the home as well as in daily habits.

Regardless of whether you rent or own a condo or a house, there are several low cost options to fix problems you might find.

Instead of turning up the heat when you feel a little chilly during the cold season, consider grabbing a blanket or putting on a sweater and maybe slippers or extra socks! You can also change or clean your furnace filter monthly to improve efficiency. For better air flow and heat distribution, make sure that furniture is not blocking your heat vents.

Apply weatherstripping

Weatherstripping allows you to seal the gap around windows and doors. It is generally inexpensive and will make your home feel warmer, while also saving money on your energy bills.

Use draft snakes

Whether they are store-bought or homemade by sewing a tube of fabric to fit the width of your window or door

and filling it with rice, these fabric tubes placed under a window sill or door will prevent cold air from sneaking in.

Use plastic wrap on windows

You can buy a window insulation kit from a hardware store or make your own using plastic wrap or drycleaner bags that are free of holes and double-sided tape. Ensure the plastic stretches across the window frame with about one inch of excess on all sides. For further insulation, spray the glass lightly with water and apply bubble wrap before putting up the plastic. Be sure to leave one window uncovered in each room as a fire escape.

Apply caulking

Caulking is used to seal off air leaks and keep out moisture. There are several types of caulking available. Talk to someone at your local hardware store to ensure you make the right choices for your home.

Put up heavy or layered curtains

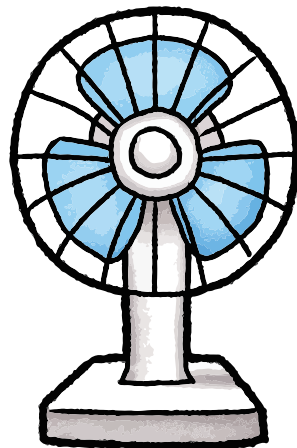
Use heavy fabrics or layer curtains over windows to keep out drafts. These can also help to block out light during hot summer days.

Install a programmable or smart thermostat

This type of thermostat lets you set your heating to turn down automatically at times when you don't typically need as much heat (for example, at night or during work or school hours) and to turn it up when you require heat. Certain smart thermostats provide more convenience by allowing you to control your home's temperature with an app on your smartphone. It can also learn your preferences and routines and automatically adjust the temperature. Smart thermostats also create energy reports to help you track your energy savings and costs.

Use a fan instead of air conditioning

Most air conditioning systems use a tremendous amount of energy. Fans can provide comfort and air movement on hot summer days, and they use far less energy than air conditioning. To maximize the use of your ceiling fan, make sure you have it turning in the correct direction. During the warm weather months, you want your ceiling fan to be rotating counter clockwise (looking at it from below), as this will push the air down towards you. You will be able to tell that the fan is turning in the right direction if you stand under the fan and feel the air moving. During the cooler weather months, change your ceiling fan's direction so that it is rotating clockwise. It will help circulate the warm air throughout the room.





TEST IT OUT!

Use the infrared thermometer to read the temperature in various spaces.



Consult page 17 for the tool's detailed instructions.

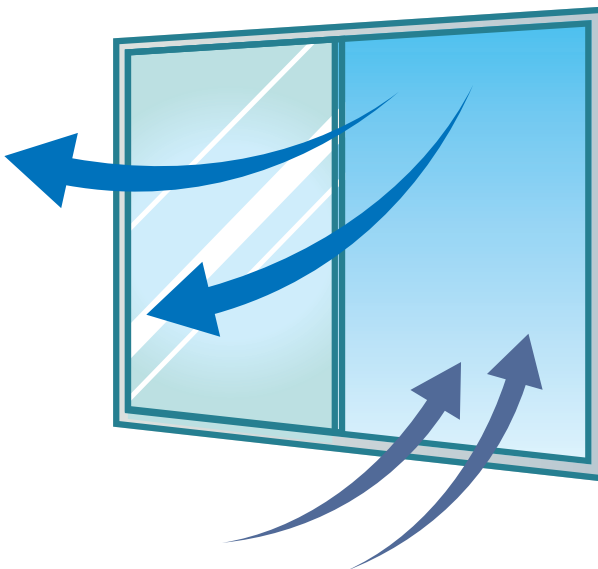
Check the temperature in a few places around your house, focusing on:

- The perimeter of doors and windows
- Baseboards and electrical outlets along exterior walls
- Heating vents
- Spaces where the walls meet the foundation, and the walls themselves

Make note of any places that seem to show a large temperature change, indicated by green or blue on the screen. Take readings in several locations in different rooms to see if your home is at an even temperature or if there are significant differences.



If you are seeing temperature differences between the top and bottom of your walls, this could indicate that your insulation has settled. Consider getting an official home energy evaluation or asking your landlord or condo board to provide one for you.



WATER

Another eco-friendly gesture is to reduce your water consumption.

A great way to reduce your GHG emissions when it comes to water consumption is to use a rain barrel to conserve water for outdoor use, such as watering gardens and flower arrangements.

Other ways include taking shorter showers, only running your dishwasher and washing machine with full loads, and turning off the tap when brushing your teeth. Using the cold water setting for laundry also saves energy. A 20% reduction in tap water use can reduce greenhouse gas emissions by 80 kg per year!

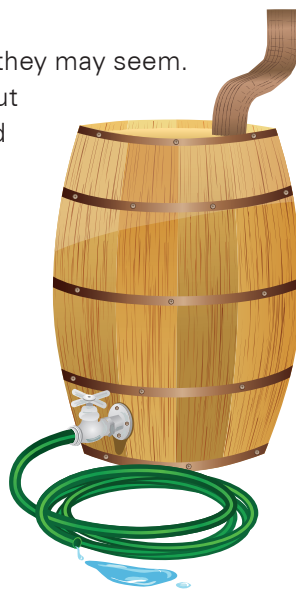
Additionally, heating water is expensive. When you use hot water in your home, not only are you paying for the water itself, but you are also paying for the energy used to heat it.

Insulating hot water pipes

Consider also insulating your hot water pipes to reduce heat loss. Insulating hot water pipes keeps the water in the pipes warmer. That way, less water needs to be heated to bring hot water to a faucet. You can also conserve energy by doing your laundry using cold water.

Lookout for leaks

Pay attention to possible water leaks, no matter how small they may seem. Not only can you prevent potential damage in your home, but you'd be surprised how much water is unfortunately wasted in the long run with the smallest leaks.





TEST IT OUT!

Toilet leak test

In just minutes, you can find out if your toilet is wasting thousands of litres of water due to a leak. Here's how:

1. Remove the tank lid, then flush.
2. After the flapper/tank ball drops and the tank refills, add several drops of dark food colouring.
3. Wait at least 20 minutes without flushing. If any trace of colour appears in the toilet bowl, there is a leak.

Leaks often occur at the flapper valve, which is simple and inexpensive to replace.



TEST IT OUT!

Use the stopwatch to measure your shower and tap flow rate.



Consult page 19 for the tool's detailed instructions.

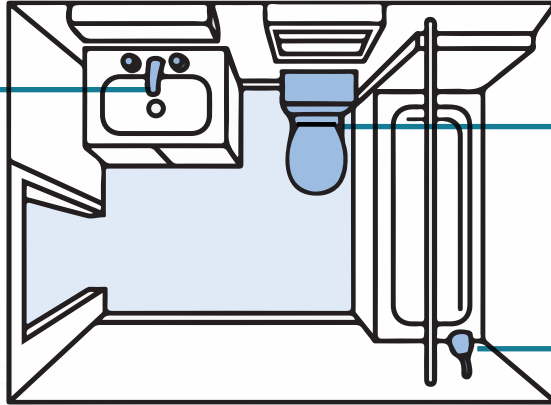
This activity is best done with two people. You will also need a bucket and a large measuring cup.

Turn on the shower or tap to full capacity. Start the timer as you put the bucket under the water. Collect all the water coming out of the showerhead or faucet for ten seconds.

Measure the amount of water in litres. Multiply the number of litres by 6 to give you a "flow rate per minute". If you collected two litres in ten seconds, the flow rate is $2 \text{ litres} \times 6 = 12 \text{ litres per minute}$.

ECO-FRIENDLY FLOW RATES

Eco-friendly flow rate
for faucets = 5 to 6
litres per minute



Eco-friendly flush rate for
toilets = 3 to 6 litres per
flush

Eco-friendly flow rate for
showerheads = 7 to 8 litres
per minute

If you see a shower flow rate higher than 15 litres per minute, you should consider installing a low-flow showerhead.

If your tap flow rate is higher than 6 litres per minute, you may want to install an aerator, which screws onto your faucet head, delivering a stream of both water and air. Most newer homes will already have aerators, but they may need replacing over time.

APPLIANCES

Although individual appliance energy costs may be low, when you add up all the appliances in your home, they can contribute significantly to your energy costs.

Always try to use the right appliance for the job. Heating up something small? Consider using the toaster oven instead of the full-size oven. Smaller appliances such as toaster ovens, microwaves, and slow cookers use less energy than the stove, even if cooking takes longer. Matching pots and pans to the right size of burner and using lids also saves energy.

There is no need to keep your fridge cooler than the suggested setting or to use the heat-dry setting on your dishwasher. If possible, run appliances only when there is a full load, maximizing energy efficiency. Some appliances even come with eco-setting suggestions.

Phantom (vampire) power

Phantom or vampire power is electricity used by a device when it is turned off. This wasted power is responsible for up to 10% of home electricity use.

An easy way to avoid this problem is to unplug your devices when not in use or plug them into a power bar and turn the bar off when not in use. Some power bars can leave one or two items fully powered while automatically shutting off the others when not in use.

Maintain your appliances

Basic maintenance ensures your appliances are working as efficiently as possible. For example, consider vacuuming the coils at the back of your fridge and draining sediment from the bottom of your hot water tank. Ensure doors seal properly.

Keep fridge, freezer, and oven door seals clean. Wipe them regularly and check the condition of the sealing strip. Inspect it for sections that are brittle, cracked, or pressed out of shape. The door seal should be strong enough to grip a piece of paper. To test it, place a piece of paper between the door and the seal and gently pull it. If the paper comes away, the seal needs to be replaced. It is a good idea to check several places around the door.

Beware of old refrigerators and freezers

Note that appliance efficiency has increased significantly in recent years. If your fridge or freezer is more than 10 years old, it may be costing you more to run than you realize. Consider reducing the number of fridges and freezers in your home, or buying newer, more efficient models. While buying new appliances can be expensive, they will use less energy and save you money long-term.



When you need to replace an appliance, look for the “Energy Star” symbol. Energy Star is a voluntary labelling program to identify and promote energy-efficient products.



TEST IT OUT!

Use the electricity usage monitor to check how much energy is used by appliances in your home.



Consult page 16 for the tool’s detailed instructions.

Plug your device in the electricity usage monitor and note how much energy it consumes when operating at full capacity, in the normal setting.

Then set your device to the Energy Efficient mode and note the difference in energy consumption. You might consider using this setting more often.

You can also test the energy consumption of the device when it off yet plugged in. Noting the phantom or vampire consumption might also encourage you to take necessary steps, as suggested above, to avoid any waste of power.



TEST IT OUT!

Use the IR thermometer to measure your fridge and freezer temperatures.



Consult page 17 for the tool's detailed instructions.

Aim at the inside of your refrigerator and freezer with the infrared thermometer and note the temperature indicated for each appliance.

It is important to keep your fridge and freezer at the correct temperature. The ideal temperature for maximum efficiency and food safety is 3°C (38°F) for the refrigerator and -18°C (0°F) for the freezer temperature.

Adjust the temperature of both appliances so that it represents these recommended settings or the one indicated in the appliance's user guide.

LIGHTING

Saving energy through proper lighting

One of the best energy-saving devices is the light switch. Try to get into the habit of turning off the lights when a room is not occupied. Consider replacing with LEDs, which are more energy efficient and longer lasting than incandescent or CFL bulbs. Also, think about how many bulbs you actually require in a room. Task lighting, such as a reading lamp, can focus light only where you need it. Lighting controls such as automatic timers, motion sensors, and dimmer switches can also help reduce electricity usage.

Making the most out of the sun's energy

You can use the sun's energy to heat and light up your house when it is cold and block it from your house when it is warm and bright. Simply open your blinds on winter days and close them on summer days.

Measuring light

There are several terms used to reference how much light is present at any one time. The most common unit for measuring light intensity is "lux". One lux is equal to the illumination of a surface one metre away from a single candle. Here are some examples of common light readings:

- **50,000 lux** = summer sunshine
- **5,000 lux** = a grey sky
- **400 lux** = a sunset or sunrise in a clear sky
- **5 lux** = common lamp post
- **1 lux** = moonlight

How much light do you need?

Once you have your current lux rating for each room in your house, compare it to the table on page 14 to determine how much light you actually need. The process of rightsizing your lighting has been referred to as "delamping". If you have too much light in an area for the tasks that are commonly done in that area, you can remove or replace one or more of the bulbs and reduce energy use. If you find your lighting is not bright enough, consider replacing bulbs with brighter, high-efficient ones such as LEDs.

The numbers presented below are given as a range, as the amount of light required depends on the amount of light one needs and one's eye health.

RECOMMENDED MINIMUM LUX

ACTIVITY	LUX
Entertaining and dining	100-200
Casual reading and grooming	220-550
Kitchen, laundry (general light)	220-550
Office work	320-640
Kitchen (food preparation), prolonged reading or studying, workshop activities, sewing (medium-coloured fabrics)	550-1 100
Sewing (dark fabrics) and hobbies involving fine detail	1 100-2 200



TEST IT OUT!

Use the electricity usage monitor to check how much energy is used by plug-in light fixtures in your home, both when they are in use and on stand-by.



Consult page 16 for the tool's detailed instructions.

Plug your different lamps into the electricity usage monitor for a day or two and note how much energy each one consumes.

After using the electricity usage monitor for a day or two, try switching an incandescent or compact fluorescent light (CFL) to the LED light provided to compare energy use (making sure that your lamp use is similar for the two comparison periods). Be sure to return the LED to the toolkit before returning it.

The results may encourage you to change your incandescent or compact fluorescent bulbs for LED bulbs.



TEST IT OUT!

Use the light meter to measure your light availability and compare it to your task needs.

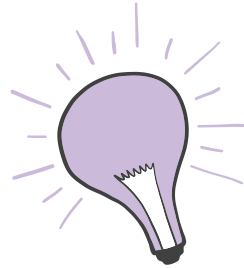


Consult page 18 for the tool's detailed instructions.

Position yourself in the room or spot where you want to measure the amount of light.

Use the light meter to measure the light and compare it with the recommended measures in the table on page 14 (Recommended Minimum Lux).

According to your needs, you can then adapt your lighting in each zone you tested, if necessary.



Definitions

Ampere	A measure of electrical current
Current	The flow of electricity
Kilowatt-hour (kWh)	The use of 1,000 watts over one hour
Volt	A unit of electricity
Watt	A measure of electric power



INSTRUCTIONS

Here are a few tips in order to help you make proper use of the various tools found in the kit.

For further instructions, you can refer to the detailed user manual of each tool available online at www.city.dorval.qc.ca.

ELECTRICITY USAGE MONITOR

1. Plug the meter into a standard wall outlet. An outlet higher up on a wall is preferred for ease of reading.
2. Reset the meter and recordings by pressing the small "Reset" button with the tip of a pen or a pin.
3. Plug any device into the meter.
4. The LCD shows various meter readings that can be scrolled through by pressing the "Function" button. On each display, there will be three values given. On the first line, the total time since plugging in the device is shown (time is initially displayed in minutes:seconds, but will switch to hours:minutes after passing 60 minutes).



On the second and third lines, several other values can be seen, by scrolling through with the "Function" button, including:

Second line	Power usage (in W)	Cumulative power usage (in KW)	Voltage usage (in V)	Load current (in A)	Minimum power used (in W)	Maximum power used (in W)	
Third line	Total cost*	Days of recording	Frequency (in Hz)	Current power factor (in PF)	Indicates "Lo"	Indicates "Hi"	Cost/ KWh*

*Note that for a value of cost to be indicated, pricing of KWh must be set before use.

5. To set the cost of electricity (per KWh), press and hold the "Cost" button, until "Cost/ KWh" flashes (approximately 3 seconds). Press the "Function" button to move between the different digits of the cost (in \$) per KWh. At the appropriate digit, increase or decrease the number using the "Up" and "Down" buttons. For example, to set the device to 0.06\$/KWh, you would need to go to the last digit and increase to

obtain the following display: 00.06 cost/KWh. Press “Cost” again once you have set the cost/KWh value you wish to use and it will stop flashing.

6. To reset the device and recordings, press the small “Reset” button with the tip of a pen or a pin.

INFRARED THERMOMETER

Does not require batteries. Use the charger.

- ▶ To prevent dropping the thermometer, please remember to use the handstrap.



Charging the infrared thermometer

1. Plug the provided cable into the charging box labeled “Infrared thermometer”.
2. Lift the flap on the top of the thermometer, revealing a micro USB port.
3. Plug the cord into this port.
4. Allow the device to charge for 4 to 6 hours.

Using the infrared thermometer

1. Press and hold the power button for a few seconds to power on. If the screen goes black, it has likely timed out. Just press and hold the power button again.
2. The center of the screen will show an infrared image, while the top left corner shows the temperature at the center of the image (in the white square).
 - Greens and blues represent cooler temperatures.
 - Yellows, oranges, reds, and whites represent warmer temperatures.
3. Pull and release the trigger to take a photo (as you pull the trigger, a luminescent red dot will appear on the object you are pointing at).
 - **Note:** The image will automatically delete after 5 seconds. If you want to keep the image, use a camera or smartphone to take a picture of the thermometer screen.
4. Pull the trigger again to return to real-time imaging. Press and hold the power button to turn the device off.



Here is an example of what you may see.

- ✗ Do not point the laser at a person’s eyes. This could cause blindness. The infrared thermometer should not be handled by a child without proper parental supervision.



LIGHT METER

Requires a 9V battery



1. Press the red power button to turn on the device.
 - If the ERR1 message appears, check to make sure the light-sensor protective cap is secure.
2. For most rooms, the light-sensor should be set to the “Range 2,000” mark (the detection range will be from 1 to 2,000). To do so, press the RANGE button.
3. Place the meter on a table in the room you want to measure and remove the sensor protective cap.
4. When the meter becomes somewhat stable, record the number and compare it to the table found on page 14 (Recommended minimum lux).
 - Press the HOLD button to freeze the current reading on the display. Press the button again to resume normal operation.
5. When finished with the light meter, be sure to place the light-sensor protective cap back on and power off the device by pressing the red button until you see a 3-0 countdown.

STOPWATCH

Requires one AAA battery



Functions

1. Make sure the stopwatch is set in the appropriate display mode to calculate the elapsed time. If the current display is not the proper one, press the MODE button until SU, FR, and SA start flashing together at the top of the LCD screen.
2. Make sure the timer is reset back to 0:00:00 by pressing the SPLIT/RESET button.
3. Press START/STOP to start counting and to stop.
4. Press the SPLIT/RESET button to reset the timer to 0:00:00.

