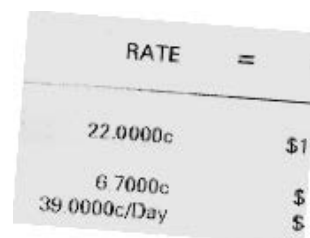


# Worksheet Activities.

## Power-Mate Lite (PML)

### A. How much do you pay for electricity?

1. Find your latest power bill. You'll see a lot of numbers relating to meter readings, usage amounts, usage rates and the cost.
2. Your usage rate is normally on the second page of your bill and written as cents per kWh. Write this amount on your worksheet in **Table A** (Activity A).



RATE	=	C
22.0000c		\$1
6.7000c		\$
39.0000c/Day		\$

For more help in understanding your electricity bill, visit your electricity provider's website or call them.

### B. How much power does your fridge/freezer use?

This activity will help you measure the power for your fridge/freezer. Take your measurement for 24 hours for an accurate measurement.

1. Fill in the first two columns in **Table B** (Activity B) on your worksheet.
2. Plug your fridge into the Power-Mate Lite (PML), and then plug the PML into a power point and turn the switch on.  
**Note:** your fridge/freezer will continue to work while it is being measured. You should use them as you would normally, so you get the most accurate measurement.
3. Clear the previously stored data:
  - a. Hold **RUN** until **CONFIRM CLR DATA?** is displayed.
  - b. Click **RUN** to confirm **YES**.
4. Set the timer to 24 hours to measure a full cycle:
  - a. Click **MENU** until **RUNTIME** is displayed.
  - b. Hold **MENU**, the words **TIMER DURATION** will be displayed.
  - c. Click **ZOOM**, scroll through the timer options until 24 hours is reached and click **MENU** to select.
5. When the timer is set, the screen name will change from **RUNTIME** to **ENDTIME** and display the set time.
6. Click **RUN** to start the timer. Wait one day.
7. When the timer has finished **ENDTIME** will be displayed as 0. Click **MENU** once to see the **COST** screen. Write the figure displayed next to **HOUR** in the 'Cost per hour' **column C** on the worksheet next to the appliance you measured.

8. Click **MENU** twice to go to the **ENERGY** screen. Record the figure displayed next to **HOUR** in the 'Energy per hour' **column D** on the worksheet next to the appliance you measured.
  9. Fill in **columns E** and **F**. You will now know the yearly energy use and cost to run your appliance.
  10. Disconnect your fridge/freezer from the PML. Remember to plug your fridge/freezer into the power point and switch it back on.
  11. Repeat this activity for your second fridge or if you have a separate freezer.
- You will now know how much power your fridge/freezer uses.

## C. How much power do your main appliances use?

Use this activity to measure the following appliances:

### Take measurement for 1-5 minutes

- television
- clothes dryer

### Take measurement for complete use

- washing machine (do a load of washing)
- portable heater (heat your room)
- portable air conditioner (cool your room)

1. Fill in the first two columns of **Table C** (Activity C) on your worksheet.
2. Plug your appliance into the PML, and then plug the PML into a power point and turn the switch on.
3. Clear the previously stored data:
  - a. Hold **RUN** until **CONFIRM CLR DATA?** is displayed.
  - b. Click **RUN** to confirm **YES**.
4. When measuring your washing machine and portable heater/air conditioner, you should measure it for the time you use it (for example, do a load of washing, heat/cool your room) because these appliances work on cycles. When measuring your television and clothes dryer, wait 5 minutes before taking your reading. For a more accurate reading, set the timer on the PML for one hour.
5. When you have finished using your appliance, measure the electricity:
  - a. Click **RUN**
  - b. Write the figure displayed next to **HOUR** on the **COST** screen in the 'Cost per hour' **column C** on the worksheet next to the appliance you are measuring.
  - c. Click **MENU** twice to go to the **ENERGY** screen. Record the figure next to **HOUR** in the 'Energy per hour' **column D** on the worksheet next to the appliance you are measuring.
6. Turn off your appliance and disconnect the PML.
7. Fill in **columns E** and **F** on your worksheet.
8. Repeat the activity on all the listed appliances.

You will now know the yearly energy use and cost to run each of the appliances you measured.

## D. How much power do your appliances use on standby?

Use this activity to measure the standby power of the following appliances. Standby is when the appliance is not being used, but is turned on at the power point and may have a light or clock display.

### Take measurement for 1-5 minutes

- television
- microwave
- computer/laptop

1. Fill in the first two columns of **Table D** (Activity D) on your worksheet.
  2. Plug your appliance into the PML, and then plug the PML into a power point and turn the switch on. Make sure that your appliance is in standby mode (i.e not in use but turned on at the power point).
  3. Clear the previously stored data:
    - a. Hold **RUN** until **CONFIRM CLR DATA?** is displayed.
    - b. Click **RUN** to confirm **YES**.
  4. Measure electricity:
    - a. Click **RUN**, wait 1–5 minutes to take your measurement.
    - b. Record the figure displayed next to **HOUR** on the **COST** screen in the 'Cost per hour' column C on the worksheet next to the appliance you are measuring.
    - c. Click **MENU** twice to go to the **ENERGY** screen. Record the figure displayed next to **HOUR** in the 'Energy per hour' **column D** on the worksheet next to the appliance you are using.
  5. Turn off your appliance and disconnect the PML.
  6. Fill in columns E and F.
  7. Repeat this activity on the other appliances listed.
  8. Add the numbers in column E to see how much money you can save by turning off appliances that use stand by power. Add the numbers in column F to see how much energy you can save.
- You will now know the yearly energy use and cost of having your appliances on standby.

## Infrared Thermometer

### E. Where are draughts in your house?

1. In your living room, aim the thermometer next to an area likely to contain a draught, like an external door, window, gap in floor boards or other gaps and cracks.
  2. Press and hold the trigger to turn the thermometer on, then continue to hold to scan, using an up and down motion across the area.
  3. If there is a draught (cold air or hot air coming in through a gap), the temperature reading on the thermometer will change.
  4. Write the location of the draught in **Table E** (Activity E) on your worksheet in the column 'Location' next to 'Living room'.
  5. Repeat steps 1–4 for the other areas in the room.
  6. Repeat steps 1–5 for other rooms in your house. Write your results for each room next to the room name.
- You will now know where it is best for you to install draught seals or weather strips in your home.

# Thermometer

## F. Is the temperature of your fridge/freezer and heating/cooling set appropriately?

### What is the temperature of your fridge and freezer?

1. Place the thermometer in your fridge.
2. Close the fridge door.
3. Leave the thermometer in the fridge for 15 minutes to get an accurate temperature reading.
4. Take the thermometer out of the fridge – be sure to read the temperature gauge quickly as it will move back to room temperature.
5. Write the result in Table G (Activity G) on your worksheet.
6. Repeat steps 1–4 to take the temperature of your freezer.

Check your measurements against the recommendations and adjust your fridge/freezer temperatures as needed.

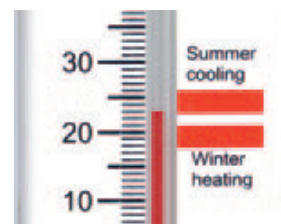


### What is the temperature of your living room in summer?

*Do this activity if the weather is warm.*

1. Cool your living room as normal.
2. Place the thermometer on a flat surface in your living room, making sure it's out of the sun.
3. Leave the thermometer for 15 minutes to get an accurate temperature reading.
4. Read the temperature gauge.
5. Write the result in Table G (Activity G) next to 'Living room temperature (summer)'.

Check your measurements against the recommendations and adjust the temperature of your air conditioner as needed.

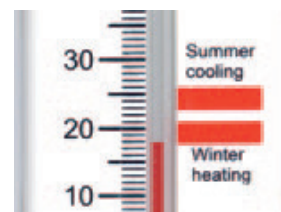


### What is the temperature of your living room in winter?

*Do this activity if the weather is cold.*

1. Heat your living room as normal.
2. Place the thermometer on a flat surface in your living room, making sure it's out of the sun.
3. Leave the thermometer for 15 minutes to get an accurate temperature reading.
4. Read the temperature gauge.
5. Write the result in Table G (Activity G) next to 'Living room temperature (winter)'.

Check your measurements against the recommendations and adjust the temperature of your heater as needed.



# Further **Activities**

## **Power-Mate Lite (PML)**

### **A. How much extra money does it cost to boil a full kettle?**

Have you ever boiled a full kettle when you only needed one or two cups?

1. Fill your kettle up with water.
2. Plug your kettle into the Power-Mate Lite (PML) then plug this into a power point.
3. Follow the instructions for worksheet **Activity C** (on page 15) and take an ENERGY and COST reading. Write your results on a separate piece of paper.
4. Turn your kettle on and boil the water.
5. Try the activity again, but only fill the kettle with two cups of water.
6. Compare your results.

Remember when using your kettle to only fill it with as much water as you need.

## **Power-Mate Lite**

### **B. What is the difference between hot and cold water clothes wash?**

**Note:** you can do this if your washing machine is plumbed to a cold water tap only (which means that the washing machine heats water internally). This activity will not work if your washing machine is plumbed to both hot and cold water taps as the water is heated by your hot water system.

1. Plug your washing machine into the PML and then into a power point.
2. Put your clothes in the machine, select a hot water wash and start your machine.
3. When the load has finished, follow the instructions for worksheet **Activity C** (on page 15) and take an ENERGY and COST reading.
4. Record your results on a separate piece of paper.
5. When you need to do another load of washing, select a cold water wash. Start your machine.
6. When the load has finished, follow the instructions for worksheet **Activity C** (on page 15) and take an ENERGY and COST reading.
7. Record and compare your results.

Compare the results. You will now know how much money and energy you can save if you change from hot to cold water wash.

### **C. How much power do other appliances use when turned on?**

Follow the instructions for worksheet **Activity C** (on page 15). Use the Power-Mate Lite to measure how much the following appliances cost to use:

- dishwasher (if you can access the power point easily)
- pool pump
- games console
- hair dryer/straighteners

Write down your results. You will now know how much power these appliance use.

### **D. How much power do other appliances use when on standby?**

Follow the instructions for worksheet **Activity D** (on page 16). Use the Power-Mate Lite to measure how much the following appliances cost to have on standby:

- mobile phone charger
- MP3 docking station
- coffee machine
- games console
- printer
- stereo

Write down your results. You will now know how much money and power you can save by switching off these appliances at the power point.

# Infrared Thermometer

## **E. Do curtains/blinds make a difference in your room temperature?**

During summer, do this experiment during the day to measure how curtains/blinds block heat out. During winter conduct your measurement at night to see how curtains/blinds keep warmth in.

1. Use the compass to determine the north facing side of the house.
2. Locate the windows on the north facing side of the house and open the curtains/blinds.
3. Wait for the room to warm up. This may take up to half an hour.
4. Follow the instructions for how to use the infrared thermometer (on page 11).
5. Use the thermometer to measure the temperature of the north facing window.
6. Write down your results on a separate piece of paper.
7. Now close the curtains/blinds/shutters – wait up to half an hour and take the temperature again.
8. Write down your results.
9. Do this for south, west and east facing windows.

You will now know how well your curtains and blinds are helping keep your room cool in summer and warm in winter.

# Thermometer

## **F. Is your electric hot water system set too high or losing too much heat?**

**For electric hot water systems only.**

1. Choose the hot water tap closest to your electric hot water tank (as this minimises heat lost through the pipes and will give the most accurate reading).
2. Turn on the hot water tap.
3. Place the thermometer in the hot water stream for 2 minutes.
4. Turn off your hot water tap.
5. Read the temperature gauge and compare this to the recommended level on the thermometer, 60–65°C\*. If it is higher than recommended you are using more power heating your hot water than you need. Any change in the temperature of your storage hot water system must be made by a plumber.
6. Compare the measured temperature to the set temperature on the hot water system, if there is a large difference you might be losing heat through your pipes (which can be insulated) or from the system itself if it is located outside (a solar jacket can help with this).

You will now know how well your curtains and blinds are helping keep your room cool in summer and warm in winter.

# Action Plan

There are simple things we can all do that will lower power bills and reduce our impact on the environment. See how much you can save and tick the actions that you will commit to or continue doing.

Fridge/Freezer	\$ savings per year	Black Balloon savings	Commit to do ✓
Buy a new fridge/freezer with at least 5 stars	\$135	13,000	
Switch my second fridge off when I'm not using it	\$225	21,000	
Recycle my second fridge	\$225	21,000	
Shut the fridge/freezer door, fix seals, leave space around the motor and set the thermostat to the recommended setting 3–4°C	\$25	2,000	

## Appliances

Hang my clothes on the line to dry (instead of using a clothes dryer)	\$300	28,000	
Switch off appliances at the power point when not in use	\$110	10,000	

## Heating and cooling

Install draught seals and weather stripping around any doors and windows that have draughts	\$15	2,000	
Install close fitting, heavy curtains to keep heat inside in winter	\$45	4,000	
In winter set my heater to the recommended temperature of 18–21°C	\$115	11,000	
Use a fan instead of a portable air conditioner in summer	\$115	11,000	
Install external shade to keep heat out in summer	\$45	4,000	
In summer set my air-conditioner to the recommended temperature of 23–26°C	\$55	5,000	
Shade external windows with awnings, blinds or plants (in summer)	\$20	2,000	
Only heat and cool areas we are using by closing doors \$65	\$65	6,000	
Install ceiling insulation	\$105	10,000	

## Hot water

Reduce my shower by three minutes – savings per person	\$35	10,000	
Install a 3 star rated showerhead to reduce the water flow – savings per person	\$30	9,000	
Install tap aerator or flow regulator to reduce water flow – savings per tap	\$3	1,000	
Wash my clothes in cold water	\$30	8,000	

## Lighting

Replace all incandescent lights with compact florescent lights	\$236	12,000	
Switch off lights in rooms not being used	\$85	8,000	

One black balloon represents 50 grams of carbon pollution. The average NSW home produces 160,000 black balloons of carbon pollution a year.

These estimates are based on an electricity tariff of 22.711c / kWh.



# Worksheet

To use this worksheet read the Save Power Kit instruction guide for each kit item and record the measurements you make in the tables below.

## Power-Mate Lite (PML)

### A. How much do you pay for electricity?

Follow the instructions on page 14.

1. Find your latest power bill.
2. Find the rate you pay for electricity (tariff). This is usually written on the second page of your electricity bill as cents per kWh.
3. Write down the rate you pay for electricity in **Table A**. Turn your kettle on and boil the water
4. If you do not know what your electricity tariff is, you can use a cost of 28 c/kWh (CanStarBlue 2022).

**Table A**

	cents per kWh
--	---------------

### B. How much power does your fridge/freezer use?

Follow the instructions on page 14.

1. Fill in how many hours per week you use your appliance in column A.
2. Multiply your answer in column A by 52 to find out how many hours you use your appliance per year.
3. Plug your fridge/freezer into the PML, and plug the PML into the power point.
4. Clear the previous data, set your electricity tariff and set the timer for 24 hours.
5. Leave the PML overnight to collect the data.
6. Find the cost per hour on the COST menu. Write this number in column c.
7. Find the amount of energy your appliance uses per hour on the ENERGY menu. Write this number in column d.
8. To find out how much your appliance costs per year, multiply column c by column B.
9. To find out how much energy your appliance uses per year, multiply column D by column B. If you do not know what your electricity tariff is, you can use a cost of 28 c/kWh (CanStarBlue 2022).

	COLUMN A	COLUMN B	COLUMN C	COLUMN D	COLUMN E	COLUMN F
<b>Table B</b>	Estimated usage (hours per week)	Usage (hours per year)	Cost per hour (\$ per hour)	Energy per hour (kWh)	Cost per year (\$ per year)	Energy per year (kWh)
<b>Action</b>	How many hours do you use this appliance per week?	multiply <b>COLUMN A</b> by 52	measure on PML	measure on PML	multiply <b>COLUMN C</b> by <b>COLUMN B</b>	multiply <b>COLUMN D</b> by <b>COLUMN B</b>
<b>Example:</b> Fridge/freezer	168 hours	168 x 52 = 8,736	\$0.025060	0.1139 kWh	0.025060 x 8,736 = \$218.92	0.1139 x 8,736 = 995.03 kWh
Fridge/freezer						
Second fridge						
Second freezer						

Example: A fridge turned on for the whole year is on for 8,736 hours. \* Intergral Energy Network Tariff

## C. How much power do your main appliances use?

Follow the instructions on page 15.

1. Follow the above instructions in **Activity B**.
2. Measure appliances that do not have cycles, such as your television and clothes dryer for approximately 1-5 minutes.
3. It is recommended that you measure appliances that have cycles (or cut in and out), such as your washing machine and portable heating and air-conditioning, for the entire time they are switched on. Clear the previous data, set your electricity tariff and set the timer for 24 hours.

Table C	COLUMN A	COLUMN B	COLUMN C	COLUMN D	COLUMN E	COLUMN F
	Estimated usage (hours per week)	Usage (hours per year)	Cost per hour (\$ per hour)	Energy per hour (kWh)	Cost per year (\$ per year)	Energy per year (kWh)
Action	How many hours do you use this appliance per week?	multiply COLUMN A by 52	measure on PML	measure on PML	multiply COLUMN C by COLUMN B	multiply COLUMN D by COLUMN B
Example: Television	35 hours	$35 \times 52 = 1,820$	\$0.059424	0.2705 kWh	$0.059424 \times 1,820 = \$108.15$	$0.2705 \times 1,820 = 492.31 \text{ kWh}$
Television						
Washing machine						
Clothes dryer						
Portable heater						
Portable air conditioner						

Example: If you watch television for approximately 5 hours a day, you watch television 35 hours a week, and 1,820 hours a year.

## D. How much power do your appliances use on standby?

Follow the instructions on page 16.

1. Follow the above instructions in **Activity B**.
2. Ensure that your appliances are on standby. This means that they are turned off but are still using power. They may have a small red light, clock display or feel warm.

Table C	COLUMN A	COLUMN B	COLUMN C	COLUMN D	COLUMN E	COLUMN F
	Estimated usage (hours per week)	Usage (hours per year)	Cost per hour (\$ per hour)	Energy per hour (kWh)	Cost per year (\$ per year)	Energy per year (kWh)
Action	How many hours do you use this appliance per week?	multiply COLUMN A by 52	measure on PML	measure on PML	multiply COLUMN C by COLUMN B	multiply COLUMN D by COLUMN B
Example: Television	133 hours	$133 \times 52 = 6,916$	\$0.003070	0.0139 kWh	$0.003070 \times 6,916 = \$21.23$	$0.0139 \times 6,916 = 96.13 \text{ kWh}$
Television						
Microwave						
Computer / laptop						
<b>TOTAL</b>						

Example: Your television is on standby when it is not being used, but you don't turn it off at the power point. There is usually a small red light that is on. If you use your television 5 hours a day, your television is on standby 19 hours a day. This is 133 hours a week, and 6,916 hours a year.



## Infrared Thermometer

### E. Where are draughts in your house?

Follow the instructions on page 16.

1. Go to your living room, aim the thermometer next to an area likely to contain a draught, like an external door, window, gap in floor boards or other gaps and cracks.
2. Press and hold the trigger, continue to scan the area using an up and down motion.
3. If there is a draught (cold air or hot air coming through the gap), the temperature will change.
4. Write the location of the draught next to the room, as showing in the example in Table E.
5. Repeat this for other rooms in your house. If you do not know what your electricity tariff is, you can use a cost of 28 c/kWh (CanStarBlue 2022).

Table E	Location of draughts
Example: Living room	Under door, seal around main window frame, around air-conditioning vent
Living room	
Kitchen	
Bedroom 1	
Bedroom 2	
Bedroom 3	

## Thermometer

### F. Is the temperature of your fridge/freezer and heating/cooling set appropriately?

Follow the instructions on page 17.

1. Place the thermometer in your fridge.
2. Leave for approximately 15 minutes.
3. Take the thermometer out of the fridge, be sure to read the temperature quickly.
4. Write your results in Table G
5. Repeat this activity with your freezer.
6. Repeat the activity to find out your living room temperature (the recommended temperature will depend on the current season).



Table G	Recommended temperature	Your measurement
Fridge temperature	3–4 °C	
Freezer temperature	–18 °C	
Living room temperature (summer)	23–26°C	
Living room temperature (winter)	18–21°C	