

# Extend the life of your laptop's battery

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By Fred Langa

**With proper care and feeding, the expensive lithium-ion batteries in your notebook PCs and other portable gear can run well for many, many years.**

On the other hand, common battery-care mistakes will reduce your batteries' run times and lead to needless and costly early replacement.

## The care and feeding of laptop batteries

A reader named Rick got a new laptop for the holidays and is wondering how to maximize the life of its expensive batteries:

"I just got a new laptop with Windows 7 for Christmas. The new laptop has a 6-cell lithium-ion battery. How can I get the most life from my new laptop's battery and make it last the longest?"

"Should I periodically charge and then use/drain the battery? Should I leave the battery in the laptop even when I'm using the AC plug? Will heat from the laptop when it's plugged into AC affect the lithium battery?"

Excellent questions, Rick!

Heat is the enemy of lithium-ion (Li-ion) batteries. When your laptop runs on AC, it's smart to remove the battery pack and store it in a cool place. Low temperatures forestall the inevitable and irreversible chemical changes that occur in Li-ion batteries.

In fact — and this will sound odd — if your laptop is mostly run off household AC power, you can greatly extend the life of its Li-ion battery this way: Run the battery down to about 40% of maximum charge, remove it, and store it in a tightly wrapped plastic bag inside your refrigerator! Storage at about 40 degrees F (4 to 5 degrees C) is ideal. Think of it as the 40-40 rule: 40% charge, 40 degrees F.

If you can, avoid running Li-ion batteries all the way down. Early portable electronics used nickel-cadmium batteries, which benefit from full discharge cycles. Conversely, Li-ion batteries last longer when kept in a charge state between 40% and 100%. It's OK to run Li-ion batteries flat when you have to, but the ideal scenario for longest life is one full discharge cycle for about every 30 or so partial cycles.

Sad to say, even if you're perfectly careful with your Li-ion batteries, they'll slowly go bad on their own due to their irreversible and inevitable chemical changes. This is one of the main reasons why cool storage helps preserve Li-ion battery life: the cool temperatures slow the chemical reactions.

Even a well-maintained Li-ion battery will usually show signs of age two or three years after manufacture. That's why it's not a great idea to buy a second or spare battery for your laptop unless and until you really need

to use one. If you buy a spare you don't really need, it'll slowly go bad on its own, giving you no (or reduced) return on your investment.

If you do have a spare battery, store it in the fridge with about a 40% charge when it's not in use.

When you buy replacement batteries, check the date of manufacture. This will usually be stamped or printed on the battery case. Cut-rate, bargain batteries may have been sitting on a warehouse shelf for a couple years, meaning that a good chunk of their useful life has passed before you ever plug them in.

With careful use, you can get 300 to 500 charge cycles from a new, high-quality Li-ion battery — especially when the battery's stored in a cool location when it's not in use. You should get years of good service from such a battery. With just a little luck, by the time the battery no longer holds a useful charge, you'll be ready for a new laptop, anyway!

These excellent articles provide more information on Li-Ion battery life:

- [How to prolong lithium-based batteries](#) from BatteryUniversity.com
- [The care and feeding of Li-ion batteries](#) from TechRepublic.com
- [Solving Notebook Battery Problems](#)
- [Great Feedback On Laptop Battery Problems](#)