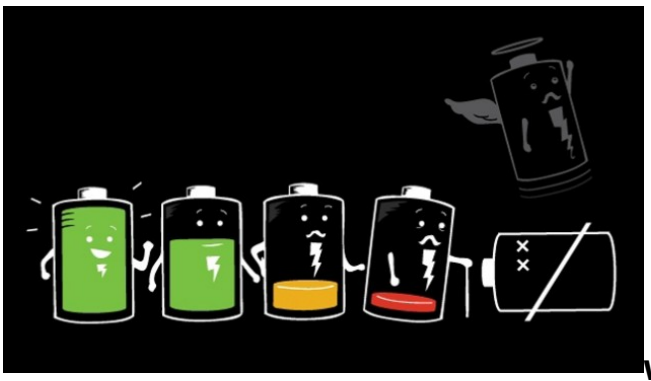

What is the deal with lithium-ion batteries (the kind found in smartphones and laptops)? I've heard lots of different things about how to take care of them, like that they need to be kept charged between 40% and 80%, or that they should be drained completely and charged to 100%. What is the ideal approach to maintaining a good battery-life-to-battery-health ratio?

There is a lot of confusion surrounding this issue, mostly because lithium-ion batteries are different from older, nickel-based batteries (which suffered from a nasty memory effect not present in lithium-ion batteries). You're right, though—charging them incorrectly can decrease their lifespan. Most lithium batteries should last you a few years, but improper care can decrease that lifespan, meaning that your battery will be unable to hold a charge—or unable to hold as big a charge as it used to—quicker. So, to clear things up, here's how to actually extend your battery's health as much as possible.

Depth of discharge	Discharge cycles
100% DoD	500
50% DoD	1500
25% DoD	2500
10% DoD	4700

1. Perform shallow discharges

Instead of discharging to 0% all the time, lithium-ion batteries do best when you discharge them for a little bit, then charge them for a little bit. The table at the right, from Battery University, shows that discharges to 50% are better for your battery's long-term life than, say, small discharges to 90% or large discharges to 0% (since the 50% discharges provide the best number of cycles-to-usage ratio).

2. Don't leave it fully charged

Similarly, lithium-ion batteries don't need to be charged all the way to 100%. In fact, they'd prefer not to be—so the 40%-80% rule you heard is a good guideline. When possible, keep it in that range to prolong its life as long as you can. And, if you do charge it to 100%, *don't leave it plugged in*. This is something most of us do, but it's another thing that will degrade your battery's health. If you need to charge it overnight, use something like the Belkin Conserve Socket to stop it from charging after it's full.

3. Fully discharge it once a month

This may seem contradictory, but hear us out. While lithium-ion batteries shouldn't be discharged regularly, most modern batteries are what's known as «smart batteries», which means that they can tell you how long you have until your battery dies (e.g. «2 hours, 15 minutes remaining»). This feature *can* get miscalibrated after a lot of shallow discharges. So, manufacturers recommend fully discharging your battery once a month to make sure this stays accurate.

4. Keep it cool

Most people overlook this one. Excess heat is not only bad for your processor (and your lap), but your battery as well. Once again, see the table from Battery University at the right—which you can click on for a closer view—a hot battery will degrade in health much quicker than a cool one. As such, we highly recommend using a laptop stand, like one of the many DIY options we've featured here at Lifehacker. When it comes to your phone, check out our previous Ask Lifehacker on keeping your phone temperature down.

Battery Temperature	Permanent capacity loss when stored at 40% state-of-charge (recommended storage charge level)	Permanent capacity loss when stored at 100% state-of-charge (typical user charge level)
0°C	2% loss in 1 year; 98% remaining	6% loss in 1 year; 94% remaining
25°C	4% loss in 1 year; 96% remaining	20% loss in 1 year; 80% remaining
40°C	15% loss in 1 year; 85% remaining	35% loss in 1 year; 65% remaining
60°C	25% loss in 1 year 75%; remaining	40% loss in 3 months

Keep these things in mind and your battery will last longer. That said, remember that you don't need to be super strict about these things. Don't sacrifice practicality just to keep your battery alive—if you're in a situation where you don't have a charger, it's okay to discharge it to 0%, or charge it up to 100% if you want to do so for a long plane ride. Remember that your battery is going to die in a few years, no matter what you do—even if you just let it sit on a shelf. So don't go overboard: use your battery as you need it. But, if you're just sitting at home or in a coffee shop, these guidelines will help you keep it healthy for as long as possible (and when it's dead, check out what do to when your battery doesn't last as long as it used to).

Got any of your own tips for extending the life of your gadgets' batteries? Share them with us in the comments!