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FEATURE

Is it bad to leave your laptop always plugged in?

There are still many myths surrounding rechargeable batteries and correct charging.

By Steffen Zellfelder
Contributor | AUG 29, 2023 7:33 AM PDT

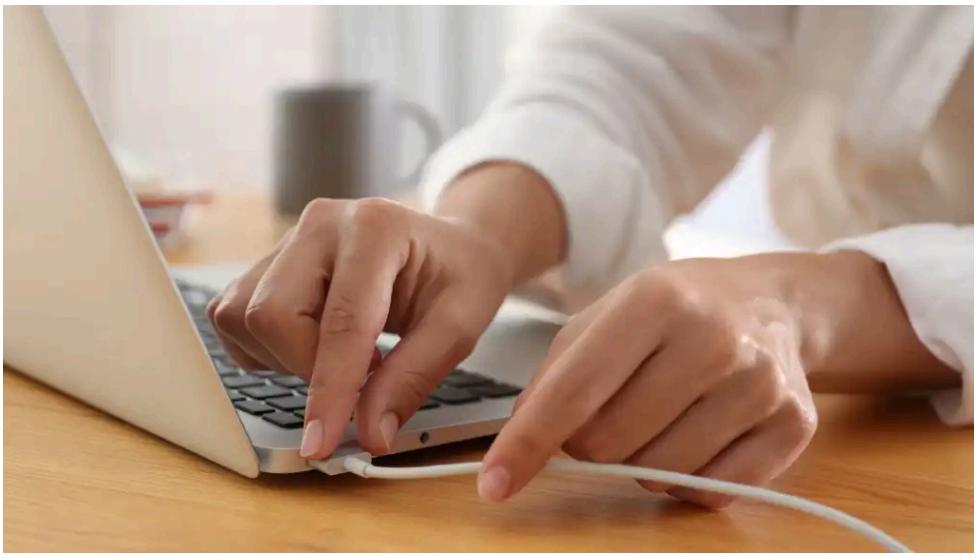

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TABLE OF CONTENTS

The laptop is always connected to the power cable — is that bad?

Lithium batteries suffer from permanently high voltage

The strength of laptops and MacBooks? Clearly their mobility. The handy devices make it possible to work, surf, or watch videos in a relaxed atmosphere even on the train, while traveling, or on vacation. But because very few of us are on the road non-stop, laptops don't spend much of their time in their intended field of competence beyond the desk and power socket — quite the opposite.

Notebooks often spend a large part of their lives at home. Most people plug their laptop into the socket at home, because then you don't have to bother with charging or discharging the battery at all. The same goes at work. Thus, the portable computer suddenly fulfils the role of a desktop PC or Mac without actually being designed for it.

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Nowadays, laptop batteries are increasingly built into the notebook housing and cannot be replaced so easily. So the question quickly arises: Does this constant charging damage the battery or shorten its life? Here's the answer.

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The laptop is always connected to the power cable — is that bad?

For older models, this question can be answered clearly and briefly: Yes, for very old mobile computers it is not a good idea to "park" them at the power socket. There is a risk of overcharging, also because batteries of old laptops are themselves quite old and have already suffered some wear and tear in the course of their life.

With newer models, however, this is less critical: Resilient batteries and sophisticated software protect the energy storage device from immediate damage caused by permanent charging. Charging processes are stopped in good time and so-called trickle charging ensures that modern batteries are kept at full charge with minimal energy surges as soon as they become even slightly discharged. The MacBook or laptop no longer draws its "working current" from the battery, the current is diverted and taken directly from the main power.

So everything's fine? Unfortunately not. Despite such protective functions, batteries that are permanently connected to the mains suffer from two chronic diseases: too much voltage and too much heat.

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Lithium batteries suffer from permanently high voltage

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Let's start with the bigger of the two problems: high voltage. The imposition on the battery is not so much the regular flow of current, but rather its state of charge. For with every percent of battery charge, the voltage in the energy storage unit also increases, and this affects its chemical aging.

Although this aging takes place in every battery, it is particularly rapid at particularly high or low voltages (i.e. at very high or very low battery levels). The recommended energy window with minimal wear for lithium batteries is between 30 and 70 percent of their maximum charge. If devices remain plugged in all the time, the battery "dwells" at the highest energy level and that means stress for the core component.

Too much heat accelerates the wear of the energy storage device

Problem number two: heat. Even without being actively used, lithium batteries lose charge all by themselves over time. If the devices are connected to the mains, such charge losses are immediately compensated and the battery is warmed up by regular micro-charges. This accelerates its wear and tear, and performance can also suffer. During active use, the temperatures in the case and thus in the battery then rise even more.

? EXPLORE FREQUENTLY ASKED QUESTIONS

- Can constant charging damage a laptop's battery?
- What are some laptop battery charging tips?
- What are some tips for prolonging laptop battery life?
- Can you replace a laptop battery if it's damaged?
- How does a laptop's battery affect its durability?

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Nevertheless, we would not recommend constantly plugging and unplugging laptops at home to keep the battery in the optimal charging window between 30 and 70 percent. On the one hand, this is terribly annoying, and on the other, the battery has to be constantly charging or discharging, i.e. actively working — and that may be a tougher lot than having to maintain maximum capacity.

Lithium-ion batteries usually tolerate between 500 and 1000 charging cycles, after which an increasing aging process becomes apparent: the capacity shrinks. It is therefore better to save these limited charging cycles for mobile use when no power socket is available. Today, you also have other sensible options for protecting and conserving the battery.

Protecting laptop batteries — what you can do

Sustainable battery care is not particularly complex. To increase the lifespan of your energy storage device, you can do the following.

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Remove the battery (if you can). If the battery is not permanently installed, the best wellness treatment for the stressed energy storage device is simple: Simply remove the component from the housing when the device is connected to the power socket (but switch it off first!). When doing so,

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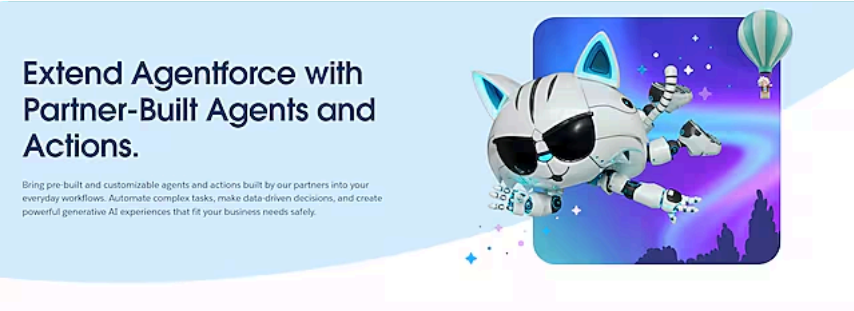
Use Smart Charging or intelligent charging under Windows: With modern laptops, you can do your battery a lot of good under Windows 10 and Windows 11 with this function. The maximum capacity of the battery is temporarily redefined: to about 80 percent of the actual maximum. In this way, the battery always remains in a healthy energy window even when the power connection is active. With Lenovo laptops, for example, this also works in their own manager called Lenovo Vantage.

Apple has its own helpful suggestions for maximizing battery performance in a MacBook.

Do not recharge the battery immediately: If you have only slightly drained the battery during mobile use, you do not have to recharge it immediately. Remember that the battery feels most comfortable between 30 and 70 percent of its maximum charge.

Avoid cheap components: When buying charging cables and adapters, it pays not to be too stingy. The cheapest devices promise to save a few dollars, but often have poor charge control or cheap circuitry.



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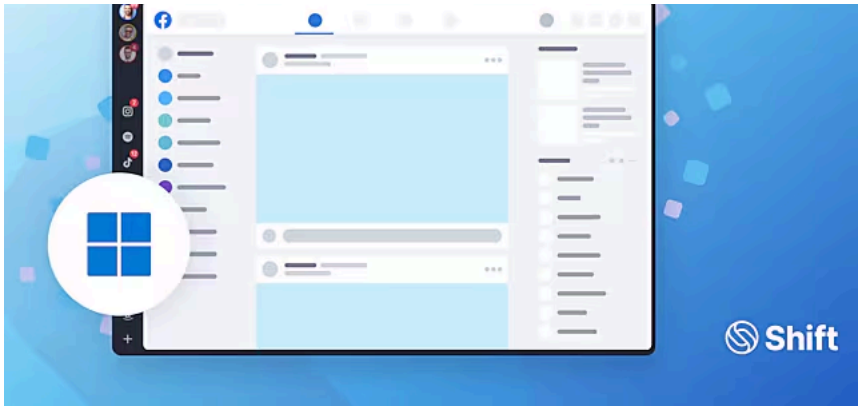
Avoid temperatures that are too high or too low: Whether laptops, MacBooks or smartphones: Lithium batteries work best in a temperature window of -10 to +40 degrees Celsius. Direct sunlight is therefore taboo, especially in summer, and you should also refrain from charging when batteries are very hot or very cold.

This article was translated from German to English and originally appeared on pcwelt.de.



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Author: Steffen Zellfelder, Contributor

Steffen Zellfelder is a freelance graduate journalist from Bonn. As an experienced software expert, he is particularly enthusiastic about apps, tools and future trends.

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