Tablets in the Enterprise

How and when to charge your tablet battery

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Takeaway: Jack Wallen provides some tips for maximizing your tablet battery for a life of extended mobility.

Tablets have taken over the mobile world, because they are the best of all mobile worlds – smaller and lighter than laptops, and more useable than smartphones. It's also possible to get a better battery life in your tablet than you do with your smartphone or laptop, extending you beyond a full day of work. However, this won't happen if you're careless with your usage and your battery. Believe it or not, there are ways to maximize that battery for a life of extended mobility.

The life of your tablet battery

Much of the change in batteries grew out of the necessity of safety in portable devices. Because mobility means taking a device through severe heat, cold, shock, and vibration, the batteries had to designed for maximum safety and longevity. Although many may doubt this claim, storing energy of several kilowatts can be dangerous, especially when stored in a device that's constantly on the move and often dropped, shaken, and exposed to harsh environments.

Since these batteries are tucked safely away from the user, it's up to the physical and software systems — the Battery Management System (BMS) — to care for them. The BMS handles some fairly complex tasks, such as managing the integrity of a battery when cells begin to fail (usually do to the battery lifespan). Unfortunately, the BMS can't do everything. The user of the device still has to take care of the mobile to ensure extended and safe battery life.

Here are three main tips that should easily apply to all batteries in mobile devices:

Temperature: Do not expose your device to extreme temperatures. Cooler temperatures prevent battery corrosion, so it's always best to keep your device from overheating. It happens. Working with a tablet in your lap, you can feel the warmth heating up your legs. That means the battery is also getting hot. Work with your tablet in such a position that heat can easily dissipate.

Discharge: It's a myth that modern batteries need a full discharge to retain "memory" (this only applies to a nickle-based battery pack). Every full cycle wears the battery down by a small amount. So, smaller discharges are better. Try not to let your battery go beyond the half-way point before applying a charge.

Abuse: This is a no-brainer, but people do get careless, and every drop of that tablet runs the risk of damaging the battery within. This also applies to improper discharges. These types of discharges can happen when a process gets out of control and is allowed to continue on, which quickly runs down the battery. If you see this happening (if the tablet starts responding slowly), find the rogue process and kill it or restart the tablet.

Let's look at some more tips on how and when to charge your tablet battery.

First charge: When you first unbox your tablet, you should approach the first charge differently, depending upon the type of battery the tablet has:

- Lead acid: The battery should be fully charge. Apply a top-off charge before using.
- Nickle-based: Charge the battery 14-16 hours before the first use.
- Lithium Ion: Apply a top-off charge before the first use.

Full vs. partial charge: Some batteries actually do poorly if you only give it a partial charge.

- Lead acid: You must always give this battery a full charge, as a partial charge can create sulfation.
- Nickle-base: A partial charge is good.
- Lithium Ion: A partial charge is actually better than full charge.

Full discharge: There are types of batteries that actually prefer a complete discharge now and then.

- Lead acid: A deep discharge can damage the battery.

- Nickle-base: Apply scheduled discharges only to prevent the battery from retaining memory.
- Lithium Ion: A deep discharge can damage the battery.

Battery calibration: Some batteries do not need calibration. Here are the details:

- Lead acid: Not applicable.
- Nickle-base: Apply a discharge/charge when the fuel gauge becomes inaccurate. Repeat every 1-3 months.
- Lithium Ion: Apply a discharge/charge when the fuel gauge becomes inaccurate. Repeat every 1-3 months.

Use while charging: Is it okay to have your device on while charging it?

- Lead acid: It's okay to have device on when charging.
- Nickle-base: It's always best to turn the device off during a charge, since a parasitic load can either alter full-charge detection, overcharge the battery, and/or cause mini-cycles.
- Lithium Ion: It's always best to turn the device off during a charge, since a parasitic load can either alter full-charge detection, overcharge the battery, and/or cause mini-cycles.

Unplugging when charged: Is it necessary to unplug your device once the charge is complete?

- Lead acid: This depends on the charger. If the charger has correct float voltage, then it's fine.
- Nickle-base: Always remove your device after a few days in the charger.
- Lithium Ion: This is unnecessary, because the charger turns off.

Temperature: How does temperature effect charging?

- Lead acid: It creates a slow charge from 32-113 degrees Fahrenheit / fast charge from 41-113 degrees Fahrenheit / the threshold is lowered above 77 degrees Fahrenheit.
- Nickle-base: It creates a slow charge from 32-113 degrees Fahrenheit / fast charge from 41-113 degrees Fahrenheit / the battery will not fully charge when it's hot.
- Lithium Ion: Do not charge below freezing. Do not charge when above 122 degrees Fahrenheit.

Of course, this doesn't take into consideration the effects of various types of software or networks (such as 4G, which will quickly drain a battery). Ultimately, if you use your battery with intelligence, it will reward you with a long life.