BILL'S HOME TECH
Home & Small Business Tech Solutions

BILL'S COMPLETE MANUALS

# Batteries

Battery health, good charging habits, cold weather and when to replace — explained in plain English

**A plain-English guide for phones, tablets, laptops, watches and earbuds**

Take your time — you can't break it

*Written for you by Bill — Bill's Home Tech*

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*iPhone, Android, Mac, Windows, Apple Watch & earbuds · facts current November 2026*

# What's Inside

This is your battery guide. It shows you how to check the health of the battery in your phone, laptop, watch and earbuds, which charging habits actually help, what quietly drains a battery, how cold and heat affect it, and how to tell when it's time for a replacement. It also covers the one battery problem that is a real safety issue: a swollen or damaged battery. Read it in any order. Chargers, cables and power banks have their own companion guide, Chargers, Cables & Power Banks.

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PART 1

# Getting Started

Why batteries wear out, what "battery health" really means, and the signs that tell you your battery is getting tired.

CHAPTER 1

# A Note from Bill

Hello, and welcome. If you've ever looked at your phone at two in the afternoon and wondered why it's already down to 20 percent, this guide is for you. Batteries are the part of our gadgets we think about least, right up until the moment they let us down.

I'm Bill. I've spent more than 30 years helping people with their technology, and these days I do it for families here in Portage County, Ohio. Battery questions come up in guide after guide in my library, so I wrote this guide the way I'd explain it at your kitchen table: slowly, in plain English, and without trying to sell you anything.

## What you'll find in this guide

- **How to check battery health** on an iPhone, a Samsung or Google Pixel phone, a Mac, a Windows laptop, an Apple Watch and earbuds.
- **Charging habits that really help**, and the old myths you can stop worrying about.
- **What drains a battery** and how to find the app that's eating yours.
- **Cold and heat**, and why your phone may shut off at a winter football game.
- **When to replace a battery**, where to go, and what affects the cost.
- **Swollen or damaged batteries**: how to spot one, how to stay safe, and how to get rid of it properly.

WHAT THIS DOES FOR YOU

### What this does for you

A little battery know-how means fewer dead phones at the wrong moment, a laptop that lasts through the afternoon, and devices that last a year or two longer before you have to replace them. And you'll know the difference between a battery that's simply tired and one that's actually unsafe.

## You can't break it

Looking at your battery health screens is completely safe. Nothing in the health screens changes how your device works, and every charging setting in this guide can be turned back the way it was. Take your time and poke around.

## A companion guide

This guide is about the battery itself. If your question is really about the *charger*, the cable, fast charging, wireless charging or power banks, look at the companion guide, **Chargers, Cables & Power Banks**. The two fit together, and I've tried not to repeat myself.

If anything here feels like too much, call me at **(330) 200-8042**. No question about batteries is too small.

***— Bill***

CHAPTER 2

# How Batteries Age, in Plain English

Almost every phone, tablet, laptop, watch and pair of earbuds today runs on a **lithium-ion** battery. These are wonderful batteries: light, powerful and rechargeable hundreds of times. But like tires on a car, they wear out slowly with use and with age, no matter how careful you are.

## Capacity: how big the "tank" is

Think of the battery as a fuel tank. When your phone was new, the tank was full size. Over time the tank itself gets a little smaller. Your phone still shows 100 percent when it's full, but 100 percent of a smaller tank doesn't last as long. That shrinking is what the **battery health** or **maximum capacity** number measures.

GOOD TO KNOW

### A new word: charge cycle

A **charge cycle** means using up 100 percent of the battery's capacity in total, not necessarily all at once. Using half today and half tomorrow adds up to one cycle. Some devices show a **cycle count**, which is simply how many of those full cycles the battery has been through.

## What makes a battery age faster

- **Heat** is the biggest one. A hot battery ages faster, whether the heat comes from the sun, a hot car, or heavy use while charging.
- **Sitting at 100 percent for long periods**, especially when warm. This is why phones now have "optimized" charging features (Part 3).
- **Running it all the way to empty** often. It won't hurt the battery to do it now and then, but it's not a habit worth keeping.
- **Simply getting older.** Even a battery that's barely used slowly loses capacity over the years.

## The 80 percent line

You'll see the number **80 percent** throughout this guide. That's the point at which the major makers consider a battery worn. Apple's AppleCare+ coverage replaces an iPhone battery that holds less than 80 percent of its original capacity, and Google labels a Pixel battery **Reduced** and recommends replacing it once it falls below 80 percent.

TIP

### It's not a cliff

A battery at 79 percent doesn't suddenly stop working. It just doesn't last as long between charges. Whether you replace it depends on whether it still gets you through your day.

CHAPTER 3

# Signs Your Battery Is Wearing Out

You don't need a health screen to suspect a tired battery. Your device usually tells you in other ways first. Here are the common signs, from mild to serious.

## Everyday signs of a tired battery

- It **doesn't last the day** anymore, even though you use it the same way you always have.
- The percentage **drops in big jumps**, for example from 30 percent to 10 percent in a few minutes.
- It **shuts off suddenly**, even though it said there was charge left, especially in the cold.
- It **feels slower** than it used to. On an iPhone, a worn battery can lead the phone to limit its own peak speed to avoid unexpected shutdowns (Chapter 4 explains this).
- It only works **while plugged in**.

## Signs that mean stop and be careful

These are different. They can mean the battery is damaged, not just tired, and that's a safety matter:

- The screen is **lifting** away from the body, or the case is **bulging** or no longer lies flat.
- On a laptop, the **trackpad is pushed up** or the bottom is bowed.
- The device gets **unusually hot** while doing very little, or gives off a **strange smell**.
- You see **smoke, hissing or popping**.

STAY SAFE

### If you see any of these

Stop using and stop charging the device. Don't press on the bulge. Move it away from anything that can burn and onto a hard surface. Chapter 24 walks you through exactly what to do next. If there's smoke or fire, get away from it and call 911.

## Is it the battery, or something else?

Sometimes a battery gets blamed for something an app or setting is doing. Before you pay for a new battery, check the health screen (Part 2) and look for a battery-hungry app (Part 4). If the health number is good, the fix may be free.

WHAT THIS DOES FOR YOU

### Why this helps

Knowing the difference between "tired" and "damaged" keeps you safe, and knowing the difference between "battery" and "app" can save you the cost of a repair you didn't need.

PART 2

# Checking Your Battery's Health

Where to find the battery health screen on each kind of device, and how to read what it tells you.

CHAPTER 4

# iPhone Battery Health

The iPhone has the clearest battery health screen of any phone. It takes about ten seconds to check.

## How to check

1. Open **Settings**.
2. Tap **Battery**.
3. Tap **Battery Health**. (On iPhone 14 and earlier models it's called **Battery Health & Charging**.)

## What you'll see

| On the screen | What it means |
|---|---|
| **Maximum Capacity** | How much the battery can hold now, compared with when it was new. 100% is new; below 80% is considered worn. |
| **Peak Performance Capability** | A sentence, not a number. It tells you whether the battery can still deliver full power for demanding moments, or whether the iPhone has had to manage performance. |
| **Messages** | If the battery is significantly worn, the screen says so and suggests service. |

## Why an older iPhone can feel slower

As a battery ages, it can struggle to supply bursts of power. To prevent the iPhone from shutting off unexpectedly, the iPhone can manage its peak performance after it has had an unexpected shutdown. If this is happening, you'll see a note under **Peak Performance Capability**. A new battery restores full performance.

WHAT THIS DOES FOR YOU

### What this does for you

If your iPhone feels sluggish and this screen mentions performance management, you've found the cause. A battery replacement is usually far cheaper than a new phone and can make an older iPhone feel new again.

TIP

### Brand-new phone, already under 100%?

Small differences are normal. Battery capacity readings are estimates. What matters is the trend over months, not one reading.

CHAPTER 5

# Samsung Galaxy Battery Health

Samsung's battery health information depends on your model and software version. Newer Galaxy phones show more detail than older ones. Here are the two places to look.

## Place 1: the Battery settings

1. Open **Settings**.
2. Tap **Battery** (on some models, **Battery and device care** first, then **Battery**).
3. Look for **Battery information** or a battery health line. On many newer Galaxy phones this shows a health percentage, and some also show a cycle count.

## Place 2: the Samsung Members app

Samsung Members is a free app that comes on most Galaxy phones. It includes a set of diagnostic checks, and one of them looks at the battery.

1. Open the **Samsung Members** app.
2. Tap **Support**.
3. Tap **Phone diagnostics**.
4. Tap **Battery status**. You'll see a plain result such as **Normal** or **Weak**.

GOOD TO KNOW

### Menu names move around

Samsung often renames and rearranges menus between versions of its software (called One UI). If you don't see the exact words above, open Settings, tap the magnifying glass, and type **battery**.

TIP

### Is the app missing?

If Samsung Members isn't on your phone, it's free in the Galaxy Store and Google Play. Make sure the developer listed is Samsung Electronics, not a look-alike.

WHAT THIS DOES FOR YOU

### Why this helps

A "Normal" result means your battery is fine and any drain you're seeing is probably an app or setting, which Part 4 helps you fix. A weak result means it's time to think about a replacement (Part 6).

CHAPTER 6

# Google Pixel Battery Health

Google added a proper battery health screen to its Pixel phones. Pixel 8a and later models show it in full.

## How to check

1. Open **Settings**.
2. Tap **Battery**.
3. Tap **Battery health**. You'll see a status of **Normal** or **Reduced**.
4. To see the estimated number, tap **Battery capacity**.

## What the status means

| Status | Meaning |
|---|---|
| **Normal** | The battery holds 80% or more of its original capacity. |
| **Reduced** | The battery holds less than 80%. Google recommends replacing it. |

GOOD TO KNOW

### Older Pixels

Pixels released before the Pixel 8a don't show a capacity reading. On those phones, the Battery health page offers battery care tips instead.

TIP

### Early readings are estimates

Google notes that the first health values are based on lab results and may differ a little from your actual battery. The reading becomes more useful as the phone learns your battery over time.

WHAT THIS DOES FOR YOU

### What this does for you

One glance tells you whether your Pixel needs a new battery or just a little detective work in Part 4.

CHAPTER 7

# Mac Laptop Battery Health

MacBook Air and MacBook Pro laptops show a simple battery condition rather than a long list of numbers.

## How to check

1. Click the **Apple menu** in the top-left corner of the screen.
2. Choose **System Settings**.
3. Click **Battery** in the sidebar (you may need to scroll down).
4. Look at **Battery Health**. Click the small **info** button next to it for more detail.

## What the condition means

| Condition | Meaning |
|---|---|
| **Normal** | The battery is working normally. |
| **Service Recommended** | The battery holds less charge than when it was new, or it isn't working normally. Apple says you can keep using it until it's checked without harming the Mac. |

TIP

### Service Recommended isn't an emergency

It's a heads-up, not an alarm. Plan a battery service when it suits you. The exception is a swollen battery: if the trackpad is pushed up or the bottom is bulging, stop using it and read Chapter 24.

WHAT THIS DOES FOR YOU

### Why this helps

Many Mac laptops are kept for years. Knowing the battery condition helps you decide between a battery service and a new computer, and the battery is often the cheaper fix.

CHAPTER 8

# Windows Laptop Battery Report

Windows doesn't show battery health on its main settings screens the way an iPhone does. Instead, it has a hidden but very useful **battery report**. It takes one typed command. Don't worry; I'll walk you through it.

## Create the report

1. Right-click the **Start** button and choose **Terminal**. (On some computers it says **Windows PowerShell** or **Command Prompt**. Any of them works.)
2. Type **powercfg /batteryreport** exactly as written, with a space before the slash.
3. Press **Enter**. Windows replies with a line saying the battery life report was saved, and where.
4. Open File Explorer, go to that folder, and double-click **battery-report.html**. It opens in your web browser.

## The two numbers that matter

Scroll to the section called **Installed batteries**. Find these two lines:

| Line | Meaning |
|---|---|
| **Design Capacity** | How much the battery was built to hold when new. |
| **Full Charge Capacity** | How much it holds today. |

Divide the second number by the first and multiply by 100. That's your battery health. For example, 40,000 divided by 50,000 is 0.8, or 80 percent.

GOOD TO KNOW

### Your laptop maker may have its own app

Many laptop makers (Dell, HP, Lenovo and others) include their own battery app that shows health and may offer a charge-limit setting. Look in the Start menu for an app with your laptop maker's name.

TIP

### This report is safe

The command only reads information and writes a report file. It doesn't change any settings.

WHAT THIS DOES FOR YOU

## What this does for you

In two minutes you know whether a laptop that dies by lunchtime needs a new battery or just a look at what's running.

CHAPTER 9

# Apple Watch and Earbuds

Small devices have small batteries, and they work hard. Here's how to check the ones that can tell you.

## Apple Watch

1. On your watch, open **Settings**.
2. Scroll down and tap **Battery**.
3. Tap **Battery Health**. You'll see **Maximum Capacity** as a percentage of its original capacity.

The same screen has the watch's charging protections. **Optimized Charge Limit** is on when you set up your watch. On Apple Watch Series 9 and later and every Apple Watch Ultra, **Optimized Battery Charging** is always on. Apple warns that turning off these protections can increase wear on the battery.

> HEADS UP
> **"Battery Needs Service"**
> If the Battery Health screen on your watch shows a message that the battery needs service, Apple asks you to contact Apple Support. Watch batteries aren't something to replace yourself.

## AirPods and other earbuds

Earbuds don't have a battery health screen. To see their *charge*, open the AirPods case near your unlocked iPhone; the charge for each earbud and the case appears on the screen. Samsung Galaxy Buds show their charge in the Galaxy Wearable app.

Recent AirPods have **Optimized Battery Charging**, which learns your routine and waits to finish charging until you're likely to need them. If one earbud runs out much sooner than the other, that bud's battery is usually the worn one.

TIP

### Earbud batteries are the hardest to replace

Earbud batteries are tiny and sealed in. When they wear out, the usual choice is the maker's battery service (if offered) or replacing the earbud. If your earbuds are covered by AppleCare+ or a similar plan, check that first.

WHAT THIS DOES FOR YOU

### Why this helps

Leaving the watch and earbud protections on is the single easiest way to make these small, pricey batteries last longer.

PART 3

# Charging Habits That Help

What actually makes a battery last longer, the settings that do the work for you, and the old myths you can forget.

CHAPTER 10

# The Truth About Charging Habits

There's a lot of old advice floating around about batteries. Some of it was true for batteries from decades ago and simply isn't true now. Here's what matters today.

## Myths you can stop worrying about

| You may have heard | The truth |
|---|---|
| **"Drain it to zero before charging."** | Not needed. Today's lithium-ion batteries are happiest with top-ups. Charge whenever it's convenient. |
| **"Never charge overnight."** | Modern phones, watches and laptops have optimized charging features built in for exactly this. Leave them on and charge overnight if that suits you. |
| **"Close all your apps to save battery."** | Not usually. Your phone manages apps in the background. Part 4 shows how to find the one app that really is a problem. |
| **"Any charger will ruin the battery."** | A good-quality charger from a reputable brand is fine. The companion guide, Chargers, Cables & Power Banks, covers how to choose one. |

## Habits that really help

- **Keep it cool.** Heat is the battery's worst enemy. Apple gives the ideal comfort zone as 62 to 72 degrees Fahrenheit (16 to 22 degrees Celsius).
- **Leave the built-in protections on.** Optimized charging, charge limits and battery protection do the careful work for you. The next three chapters show where they are.
- **Don't leave it in the sun or a hot car.** Chapter 20 explains why.
- **If a device gets hot while charging**, unplug it and let it cool. Charging warms a battery, and a thick case can hold that warmth in.
- **Storing a device for months?** Leave it about half charged (Chapter 14).

WHAT THIS DOES FOR YOU

### What this does for you

You get to stop fussing. Charge when it suits you, keep the device out of the heat, leave the built-in protections on, and you've done nearly everything that matters.

TIP

### The 20-to-80 idea

You may hear that keeping a battery between about 20 and 80 percent is gentlest. That's the idea behind the charge-limit settings in this part. It's a nice bonus, not a rule. If you need a full charge for a long day, charge to 100 percent and don't give it a second thought.

CHAPTER 11

# iPhone: Charge Limit and Optimized Battery Charging

Apple builds two battery-saving charging features into the iPhone. Both are on by default when you set up a new iPhone. It's worth knowing what they are, so you aren't surprised when your phone stops at 80 percent.

## Optimized Battery Charging

Your iPhone learns your daily routine. If you usually charge overnight, it holds the charge around 80 percent for a while and finishes charging shortly before you normally unplug. That way the battery spends less time sitting full. Apple says it needs some days of learning your routine before it starts working.

## Charge Limit (iPhone 15 and later)

On iPhone 15 and later models you can also set a fixed charge limit. The phone charges to within a few percent of your limit and stops.

1. Open **Settings**, then tap **Battery**.
2. Tap **Charging**.
3. Choose a limit from **80%** to **100%**, in 5 percent steps.
4. At 100%, you can also turn **Optimized Battery Charging** on or off. (It only works when the limit is at 100%.)

GOOD TO KNOW

### Why it sometimes charges to 100% anyway

Even with a lower limit, your iPhone occasionally charges all the way to 100 percent so its battery percentage stays accurate. And if the charge drops more than about 5 percent while plugged in, it starts charging again. Both are normal.

TIP

### Need a full charge tonight?

If you have an early start or a long trip, just set the limit back to 100% for the night. You can change it as often as you like.

WHAT THIS DOES FOR YOU

### Why this helps

These features quietly reduce the wear on your battery every night, which helps it keep more of its capacity over the years, with no effort from you.

CHAPTER 12

# Samsung and Pixel: Battery Protection and Charging Optimization

Android phones have the same kind of protections, under different names. Here are the two most common brands.

## Google Pixel: Charging optimization

1. Open **Settings**, then tap **Battery**.
2. Tap **Battery health**, then **Charging optimization**.
3. Turn on **Use charging optimization**.
4. Choose **Adaptive Charging** (the phone learns your overnight routine and finishes charging just before you need it) or **Limit to 80%** (available on Pixel 6a and later).

> **GOOD TO KNOW**
>
> **Why your Pixel sometimes goes past 80%**
>
> With the 80 percent limit on, Google says the phone still needs a full charge about every tenth cycle so its battery readings stay accurate. When that happens, leave it plugged in for at least 30 minutes after it shows 100 percent. Separately, a Pixel can hold its charge around 70 to 80 percent on its own in some conditions, such as long charging sessions in high heat.

## Samsung Galaxy: Battery protection

1. Open **Settings**, then tap **Battery**.
2. Tap **Battery protection** (on some models it's under **Device care** or **More battery settings**).
3. Turn it on and choose a mode.

| Mode | What it does |
|---|---|
| **Basic** | Charges to 100%, then waits until the battery drops to about 95% before charging again. On recent software it may also learn your routine, much like Adaptive Charging. |
| **Maximum** | Stops at a limit you choose, such as 80, 85, 90 or 95 percent. |

GOOD TO KNOW

### Names change with each Samsung update

Samsung has reshuffled these options several times. Some versions have offered an "Adaptive" or "sleep time" mode as a separate choice; others fold it into Basic. Pick whichever choice on your phone mentions a limit or learning your sleep schedule. For more detail, see the Samsung section in the companion guide, Chargers, Cables & Power Banks.

WHAT THIS DOES FOR YOU

### What this does for you

Turn it on once and your phone protects its own battery every night for the rest of its life.

CHAPTER 13

# Mac: Charge Limit and Optimized Battery Charging

Many people leave a MacBook plugged in at a desk almost all the time. That's exactly the situation these features were made for.

## Optimized Battery Charging

Like the iPhone, a Mac laptop can learn your routine and wait to finish charging to 100 percent until it expects you'll need a full battery. It's on by default.

## Charge Limit (newer Macs)

On Macs with Apple silicon (the M-series chips) running **macOS Tahoe 26.4 or later**, you can set a fixed limit.

1. Click the **Apple menu** and choose **System Settings**.
2. Click **Battery**.
3. Click the **info** button next to **Charging**.
4. Choose a **Charge Limit** between **80%** and **100%**.

GOOD TO KNOW

### Normal behavior

Your Mac charges to within a few percent of the limit and stops. Now and then it charges to 100 percent to keep its battery estimate accurate. These features work while the Mac is turned on and running macOS.

TIP

### Which chip does my Mac have?

Click the **Apple menu** and choose **About This Mac**. If it lists a **Chip** starting with "Apple M", you have Apple silicon. If it lists an Intel processor, the Charge Limit setting isn't available, but Optimized Battery Charging still helps.

WHAT THIS DOES FOR YOU

### Why this helps

A laptop that lives on a desk can spend years at 100 percent. A charge limit gently stops that, which helps the battery hold more of its capacity for longer.

CHAPTER 14

# Storing a Device You Don't Use Every Day

An old phone kept as a spare, a tablet that only comes out for trips, a laptop for the grandkids' visits: batteries in devices you don't use still need a little care.

## The simple rules

- **Store it about half charged.** Apple's advice for long-term storage is to keep the device about half charged, not full and not empty.
- **Turn it off** before putting it away.
- **Keep it somewhere cool and dry**, like a closet indoors, not an attic, a garage or a car.
- **Check it every few months** and top it back up to about half if it has drained.

HEADS UP

### Don't forget it completely

A battery left completely empty for a very long time may refuse to charge again. If you find an old device that won't turn on, plug it in and give it an hour before deciding it's dead.

STAY SAFE

### Check stored devices for swelling

When you take a stored device out, look at it before charging. If the case bulges or the screen is lifting, don't charge it. See Chapter 24.

WHAT THIS DOES FOR YOU

### What this does for you

Your spare phone or travel tablet is ready when you need it, instead of greeting you with a dead battery.

PART 4

# What Drains a Battery

How to find the app or setting that's using up your charge, and the power-saving modes that buy you extra hours.

CHAPTER 15

# Finding the Battery Hog on iPhone

If your battery health is fine but the phone still runs down fast, something is using the power. Your iPhone keeps a detailed record, and it's easy to read.

## Look at battery usage

1. Open **Settings**, then tap **Battery**.
2. Look at the chart. You can switch between the last 24 hours and up to the last 10 days.
3. Scroll down to see which apps used the most battery. Tap **View All Battery Usage** for the full list.

## How to read it

| You see | It means |
|---|---|
| **Battery Usage by App** | Each app's share of the battery used in the time you picked. |
| **Activity by App** | How long each app was actually in use. |
| **Background Activity** | The app was using power while you weren't looking at it. |

Look for an app with a big share of battery but very little time on screen. That's the one using power behind your back.

## What to do about it

- **Turn off Background App Refresh for that app: Settings** > **General** > **Background App Refresh**, then switch the app off.
- **Cut back its notifications: Settings** > **Notifications**, tap the app. Fewer notifications means the phone wakes up less often.
- **Update or reinstall the app.** A misbehaving app is often fixed by an update.
- **Delete it** if you don't use it.

GOOD TO KNOW

### Percentages are shares, not amounts

If you barely used your phone yesterday, one app may show a big percentage simply because nothing else ran. Compare the percentage with the time used, and look at a day when you used the phone normally.

WHAT THIS DOES FOR YOU

### What this does for you

Often the "bad battery" turns out to be one app. Finding it can give you back hours of charge for free.

CHAPTER 16

# Finding the Battery Hog on Android

Android phones keep the same kind of record. The exact wording differs by brand, but the idea is the same.

## Google Pixel

1. Open **Settings**, then tap **Battery**.
2. Tap **Battery usage**.
3. Look at the list of apps and how much of the battery each used since the last full charge.

## Samsung Galaxy

1. Open **Settings**, then tap **Battery** (or **Battery and device care**, then **Battery**).
2. Tap the usage chart or **View details** to see which apps used the most.

## Fixes that work on any Android phone

- **Tap the hungry app** in the usage list. Most phones let you restrict its background use right there.
- **Update the app** from Google Play or the Galaxy Store.
- **Uninstall apps you don't use**, especially ones that came with the phone and keep running.
- **Restart the phone** once a week. It clears up apps that have gotten stuck in the background.

GOOD TO KNOW

**"Android System" or "Screen" at the top?**

That's normal. The screen is usually the biggest battery user on any phone. If **Android System** or **Google Play services** is unusually high, a restart and a software update often settle it down.

SCAM ALERT

### Skip the "battery saver" and "battery doctor" apps

Apps that promise to boost or repair your battery can't do anything your phone doesn't already do, and some are loaded with ads or ask for permissions they don't need. Some pop-ups even claim your battery is "damaged" to get you to install something. Your phone's own Battery settings are all you need.

WHAT THIS DOES FOR YOU

### Why this helps

You stop guessing. One look at the usage list tells you whether the battery or an app is to blame.

CHAPTER 17

# Low Power Mode, Adaptive Power and Battery Saver

Every phone has a mode that trades a few extras for longer battery life. They're perfect for a long day out, travel, or a power outage.

## iPhone: Low Power Mode

1. Open **Settings**, then tap **Battery**.
2. Turn on **Low Power Mode**. (On newer iPhones it's under **Power Mode**.)

Low Power Mode reduces or pauses things like Mail fetch, "Hey Siri," Background App Refresh and some visual effects. The battery icon turns yellow while it's on. You can also add a Low Power Mode button to Control Center.

## iPhone: Adaptive Power

With iOS 26, Apple added **Adaptive Power** to newer iPhones. When your use is heavier than usual, it makes small adjustments, such as slightly lowering screen brightness or letting some tasks take a little longer, to stretch the battery. It's in **Settings** > **Battery** > **Power Mode**. It's on by default on the iPhone 17 models and iPhone Air; on other supported models you can turn it on yourself.

## Android: Battery Saver and Power saving

- **Google Pixel: Settings** > **Battery** > **Battery Saver**. There's also an **Extreme Battery Saver** for emergencies.
- **Samsung Galaxy: Settings** > **Battery** > **Power saving**.
- On both, you can usually add a Battery Saver button to the Quick Settings panel (swipe down from the top).

> TIP
> **Use it before you need it**
> Turning on a power-saving mode at 50 percent stretches the day much further than waiting until 10 percent.

WHAT THIS DOES FOR YOU

### What this does for you

One tap can add hours of battery when you're away from a charger, which is a real comfort during a storm or a long hospital visit.

CHAPTER 18

# Everyday Drains and Easy Fixes

Beyond individual apps, a handful of everyday things use more battery than people expect. None of these require giving up anything you care about.

## The usual suspects

| Drain | Easy fix |
|---|---|
| **A very bright screen** | Turn on automatic brightness, and lower brightness indoors. |
| **Weak cell signal** | A phone searching for signal (in a basement or rural area) works hard. Use Wi-Fi calling where you can, or Airplane Mode in places with no signal at all. |
| **Location for every app** | Set apps that don't need your location to **Never** or **While Using**. |
| **Lots of notifications** | Each one lights up the screen. Turn off the ones you never read. |
| **Video and games** | Streaming and gaming use a lot of power. That's normal, not a fault. |
| **Heat** | A hot phone drains faster and ages faster. Keep it out of the sun. |
| **Out-of-date software** | Updates often include battery fixes. Keep your device up to date. |

## Right after an update or a new phone

For the first day or two after a big software update, or after setting up a new phone, the battery may drain faster than usual. The phone is busy behind the scenes indexing photos, downloading and organizing. Give it a couple of days on the charger at night before deciding something is wrong.

TIP

### Restart now and then

A simple restart once a week clears out apps and processes that have gotten stuck. It's free and takes a minute.

HEADS UP

### It's always hot and draining?

If your phone is warm all the time, even when idle, and the battery falls quickly, it may be an app stuck in a loop, or the battery itself. Check the usage screen (Chapter 15 or 16) first, then the health screen (Part 2). If it's warm and the case is changing shape, stop and see Chapter 24.

WHAT THIS DOES FOR YOU

### Why this helps

These small changes add up. Many people find their battery lasts noticeably longer after ten minutes of tidying settings.

PART 5

# Cold, Heat and Your Battery

Why your phone dies at a winter ballgame, why a hot car is worse, and how to protect a battery through Ohio's seasons.

CHAPTER 19

# Cold Weather and Your Battery

Northeast Ohio winters are hard on batteries. If your phone has ever shut off with 30 percent left while you were shoveling, scraping the windshield or watching a game in the stands, the cold was the cause.

## What cold does

Apple says iPhones and iPads are designed to be used where the air temperature is between **32 and 95 degrees Fahrenheit** (0 to 35 degrees Celsius). Below that range, the battery can't deliver power as easily. Battery life drops for a while, and the device may turn itself off.

## The good news

The effect of cold is **temporary**. Apple says the battery's performance returns to normal once it's back in its normal temperature range. A phone that died outside will usually show a sensible percentage again once it warms up indoors.

## Winter habits that help

- **Carry your phone in an inside pocket**, close to your body, rather than in an outside coat pocket or a purse.
- **Don't leave phones, tablets or laptops in a cold car** overnight.
- **Let a cold device warm up** to room temperature before charging it. Charging may also pause by itself if the device is too cold or too hot.
- **Start the day fully charged** on very cold days, and turn on Low Power Mode or Battery Saver (Chapter 17) before you head out.
- **Keep a small power bank in an inside pocket** for long outdoor events. The companion guide, Chargers, Cables & Power Banks, helps you choose one.

STAY SAFE

### Phones and winter emergencies

If you might need to call for help (a breakdown on a back road, walking in icy weather), keep your phone warm and charged. A phone that's been off in the cold can come back to life once it's warmed in your hands or a pocket for a few minutes.

GOOD TO KNOW

### Hearing aids, watches and earbuds too

Small rechargeable devices are affected by cold in the same way. Wear your watch under a sleeve and keep earbuds in a pocket between uses.

WHAT THIS DOES FOR YOU

### What this does for you

No more surprise shutdowns on cold days, and no needless worry that the battery is "broken" when it was just chilly.

CHAPTER 20

# Heat, Hot Cars and Sunny Windowsills

Cold is a nuisance, but heat is the real enemy of a battery. Unlike cold, heat can do **lasting** damage, permanently shortening how long the battery holds a charge.

## Where batteries get too hot

- **A car on a sunny day**, especially on the dashboard or seat. Apple specifically warns against leaving a device in a hot car.
- **Direct sunlight**, such as a windowsill, a patio table or the beach.
- **Charging under a pillow or blanket**, or on a bed or couch, where heat can't escape.
- **Heavy use while charging**, like video calls or games with the phone plugged in.
- **A thick case** while charging, which holds warmth in.

## What your device does when it's too hot

Phones and tablets protect themselves. When they get too warm, they may dim the screen, slow down, stop charging for a while, or show a temperature warning and refuse to do anything until they cool. That's the device looking after itself.

## If your device shows a temperature warning

1. Unplug it if it's charging.
2. Move it out of the sun and into a cooler spot. Take it out of its case.
3. Leave it alone for a while. Don't put it in the refrigerator or freezer; a sudden change can cause condensation inside.
4. When it's back to normal, you can use and charge it again.

STAY SAFE

### Charge on a hard surface

Fire departments advise charging devices on a hard, uncluttered surface, never on a bed, couch or under a pillow, where heat can build up. A nightstand or kitchen counter is ideal.

WHAT THIS DOES FOR YOU

### Why this helps

Keeping devices out of the heat is the single biggest thing you can do to keep a battery healthy for years. It costs nothing.

PART 6

# Replacing a Battery

How to decide it's time, where to go, what affects the cost, and how to get ready.

CHAPTER 21

# When It's Time to Replace

There's no single right moment. A battery is worth replacing when it no longer fits your life. These signals help you decide.

## The makers' own signals

| Device | Where to look | The "time to replace" sign |
|---|---|---|
| iPhone | Settings > Battery > Battery Health | Maximum Capacity below 80%, or a service message |
| Google Pixel (8a and later) | Settings > Battery > Battery health | Status says **Reduced** (below 80%) |
| Samsung Galaxy | Samsung Members > Phone diagnostics | Battery status shows a weak result |
| Mac laptop | System Settings > Battery | Battery Health says **Service Recommended** |
| Windows laptop | Battery report (Chapter 8) | Full Charge Capacity well below Design Capacity |
| Apple Watch | Settings > Battery > Battery Health | A message that the battery needs service |

## Questions to ask yourself

- Does it get me through a normal day? If yes, there's no hurry.
- Is it shutting off unexpectedly or feeling slow? A new battery usually fixes both.
- Is the device still getting software and security updates? If not, put the money toward a newer device instead.
- Is anything else wrong, like a cracked screen? Sometimes it makes sense to fix both at once, or to replace the device.

STAY SAFE

**Replace right away if it's swollen**

A tired battery can wait until it's convenient. A swollen, leaking or overheating battery can't. Stop using it and see Chapter 24.

WHAT THIS DOES FOR YOU

### What this does for you

A new battery in a phone or laptop that's otherwise working well can add years of life for a fraction of the price of a new device.

CHAPTER 22

# Where to Get It Done and What It Costs

Most phone, watch and laptop batteries today are sealed inside and aren't meant to be swapped at home. Here are your options, starting with the maker.

## Apple (iPhone, iPad, Mac, Apple Watch, AirPods)

- **The price depends on your exact model.** Apple's battery-replacement page on support.apple.com gives you an estimate when you choose your model. Tax and shipping may be added, and the final cost is confirmed after the technician inspects the device.
- **AppleCare+:** if your device is covered and its battery holds less than 80 percent of its original capacity, Apple replaces it at no extra charge.
- **Standard warranty:** Apple's limited warranty doesn't cover batteries that have simply worn out from normal use.
- **Where:** an Apple Store, an Apple Authorized Service Provider, or mail-in service. Start at support.apple.com or the Apple Support app.

## Google (Pixel)

- Google lists its repair options, including walk-in and mail-in repair, on its Pixel Help and Google Store repair pages. Prices vary by model.
- Google's **Pixel Care+** protection plan includes battery repairs for eligible models.
- Google has run **special battery programs** for certain models, including the Pixel 6a and Pixel 7a. If you have one of those, check Pixel Help to see whether your phone qualifies for a free replacement.

## Samsung (Galaxy)

Samsung offers battery service through its own service centers and authorized repair partners, and by mail. The price depends on your model and whether you have a protection plan such as Samsung Care+. Go to samsung.com, choose **Support**, and enter your model to see your options and an estimate. Batteries that fail because of a defect within the warranty period are covered.

## Independent repair shops

A local repair shop is often quicker and can cost less. Ask these questions before you hand over a device:

- Do you use a genuine or high-quality battery, and is it new?
- Is there a warranty on the battery and the work?
- Will it affect any warranty or protection plan I have?
- Can you give me the total price up front?

HEADS UP

### Do-it-yourself battery kits

Online kits make it look easy, but most modern devices need the screen or back carefully removed, and a punctured battery can catch fire. Unless you're experienced with electronics repair, leave this one to a professional.

SCAM ALERT

### Watch out for "battery recall" calls and texts

Real battery recalls are announced by the maker and by the Consumer Product Safety Commission (cpsc.gov). If someone calls or texts saying your phone battery is recalled and asks for a card number, gift cards or remote access to your computer, it's a scam. Hang up and look up the maker's support number yourself.

TIP

### Costs as of November 2026

Because prices change and depend on your exact model, this guide doesn't print a price list. The maker's own website gives you an up-to-date estimate in a minute or two. A battery service generally costs far less than a new device.

CHAPTER 23

# Getting Ready for a Battery Service

A battery replacement is routine, but a few minutes of preparation protects your photos and makes the visit go smoothly.

## Before you go

1. **Back up** your device. On an iPhone, check iCloud Backup in **Settings** > your name > **iCloud**. On Android, check Google backup in Settings. On a computer, copy important files to a drive or cloud storage.
2. **Know your passcode** and your Apple Account or Google Account password. You may need them afterward.
3. **Write down your device model** so you get an accurate estimate.
4. **Ask** whether you need to turn anything off first. The repair desk will tell you.
5. **Bring the charger** if it's a laptop.

## After the service

- Check that your photos, messages and apps are all there.
- Look at the battery health screen; it should show a healthy reading.
- Turn your charging protections back on if anything was reset (Part 3).
- Keep the receipt with the warranty details.

WHAT THIS DOES FOR YOU

### Why this helps

A backup means that even in the rare case something goes wrong during a repair, your photos and contacts are safe.

FROM BILL

### Want a hand with this part?

Backing up, checking passwords and getting a device ready for service is exactly the kind of thing I help with. Call (330) 200-8042.

PART 7

# Swollen, Damaged and Old Batteries

The battery problems that are a safety matter, and how to get rid of old batteries properly.

CHAPTER 24

# Swollen or Damaged Batteries: Staying Safe

This is the most important chapter in this guide. Most battery problems are just inconvenient. A **swollen** or **damaged** lithium-ion battery is different: it's a fire risk, and it needs to be handled carefully. The U.S. Environmental Protection Agency (EPA) says plainly that swelling means the battery is damaged and is a potential fire hazard.

## How to spot one

- **Phone or tablet:** the screen lifts away from the frame, there's a gap along an edge, or the phone rocks when laid flat.
- **Laptop:** the trackpad is pushed up or stops clicking, the bottom bulges, or the lid won't close evenly.
- **Watch:** the screen lifts or pops off.
- **Any device:** heat when it's doing nothing, a sweet or chemical smell, hissing, or smoke.

## What to do, step by step

1. **Stop charging it.** Unplug it if it's plugged in.
2. **Stop using it.** Turn it off if you can do so without pressing on the bulge.
3. **Don't press, squeeze, puncture or try to flatten it.** Don't try to remove the battery yourself.
4. **Move it to a safe spot**: a hard, non-flammable surface such as a concrete floor, a ceramic tile or a metal tray, away from curtains, paper and bedding. Don't leave it in a pocket or a purse.
5. **Contact the maker** (Apple, Samsung, Google, your laptop maker) for instructions. The EPA's advice for damaged batteries is to ask the manufacturer how to handle them.
6. **Don't put it in the trash or recycling bin.** See Chapter 25 for where it goes.

STAY SAFE

### If there's smoke or fire

Get everyone away from it and call **911**. Don't try to pick up a smoking device. Lithium-ion battery fires can flare up again, so let the fire department handle it.

## Storing it until it can be taken in

If you have to keep a damaged battery or device for a few days, The Battery Network (the recycling program formerly called Call2Recycle) suggests storing damaged batteries in a non-flammable material such as sand or cat litter, in a cool spot outside the living area, such as a garage floor away from anything that can burn, until you can drop it off.

HEADS UP

### Don't mail it or fly with it

Damaged or swollen batteries aren't allowed on airplanes and shouldn't go in the regular mail. If the maker offers mail-in service, they'll give you special instructions.

WHAT THIS DOES FOR YOU

### Why this matters

Acting promptly on a swollen battery protects your home. Knowing the signs means you'll catch one early, long before it becomes dangerous.

CHAPTER 25

# Recycling and Disposing of Batteries

Old phones, laptops, power banks, cordless-tool packs and the batteries inside them should never go in the household trash or the curbside recycling bin. The EPA explains that lithium-ion batteries can start fires in garbage trucks, landfills and recycling plants.

## Getting a battery ready to drop off

1. **Cover the metal ends** (the terminals) with non-conductive tape, such as clear packing tape or electrical tape. Clear tape is nice because the label stays readable.
2. **Or bag each battery separately** in its own plastic bag.
3. **Keep loose batteries apart** so their ends can't touch each other or anything metal.
4. **Leave batteries in devices** if they can't be removed easily. Recycle the whole device.

## Where to take them

- **Battery drop-off locations.** The Battery Network (formerly Call2Recycle) has a free locator at batterynetwork.org that finds drop-off spots by ZIP code. Many are in hardware and electronics stores.
- **The device maker.** Apple, Samsung and others run recycling or trade-in programs for their own devices.
- **Your county's household hazardous waste or recycling program.** Call or check its website for collection days and what it accepts.

HEADS UP

### Damaged batteries need a special drop-off

Regular battery drop-off boxes are **not** for damaged, swollen or recalled batteries. Call the store or program first, or contact the device maker, and tell them it's damaged. They'll tell you where it can go safely.

STAY SAFE

### Wipe it before you recycle it

Before you recycle or trade in a phone, tablet or computer, back it up and erase it so nobody can read your photos, email or passwords. The companion guides on your phone and computer show how, or I can do it with you.

TIP

### Alkaline batteries are different

Ordinary household AA and AAA alkaline batteries aren't lithium-ion. Rules for those vary by community, so check with your local program. Rechargeable AA batteries and button cells should be recycled.

WHAT THIS DOES FOR YOU

### What this does for you

That drawer of old phones and chargers can finally go, safely and responsibly, without risking a fire in a garbage truck or exposing your personal information.

PART 8

# When to Call Bill & Your Cheat-Sheet

An honest word about when a hand is worth it, and one page that sums up the whole guide.

CHAPTER 26

# When to Call Bill

Most of this guide is things you can do yourself in a few minutes. But sometimes it's simply easier to have someone patient sit with you and go through every device at once. Here's my honest advice on when a call is worth it.

## Times it's well worth a call

- **A battery check-up for the whole household**: phones, tablets, laptops and watches, with every charging protection set the right way.
- **A phone or laptop that dies too fast** and you can't tell whether it's the battery or an app.
- **Deciding between a new battery and a new device**, with an honest look at what you have and how much life it has left.
- **Getting ready for a battery service**: backups, passwords and making sure nothing gets lost.
- **Clearing out old devices**: erasing them properly and getting the batteries to the right place.
- **Learning your own devices**: my **Device Training** sessions walk you through your phone, tablet or computer at your pace, including the battery settings in this guide.

STAY SAFE

### Swollen or smoking? Don't wait for me

If a battery is swollen, follow Chapter 24 right away. If there's smoke or fire, call 911. I'm happy to help afterward, but safety comes first.

## What working with me is like

I work at your pace, in your home here in Portage County or over a remote session, and I explain what I'm doing in plain words. I've been doing this kind of work for more than 30 years. I won't sell you a new device you don't need, and I'll tell you honestly when a battery service is the better choice.

FROM BILL

### How to reach me

Call **(330) 200-8042** or book a time at **billshometech.com/book**. My help is $49 remote · $99 in your home. This guide is yours to keep and share, and no question is too small.

GOOD TO KNOW

### You may meet Sophie

When you call or visit billshometech.com, you may be greeted by **Sophie**, my AI receptionist. She can answer quick questions and help you book a time. The actual help always comes from me.

Thank you for reading. A few small habits really do make your devices last longer, and you're already on your way.

***— Bill***

CHAPTER 27

# Your Battery Cheat-Sheet

The whole guide on one page. Print it and keep it near your charger.

## Where to check battery health

| Device | Where |
|---|---|
| **iPhone** | **Settings** > **Battery** > **Battery Health**. Below 80% = worn. |
| **Google Pixel** | **Settings** > **Battery** > **Battery health**. "Reduced" = replace. |
| **Samsung Galaxy** | **Settings** > **Battery**, or **Samsung Members** > Support > Phone diagnostics. |
| **Mac laptop** | **System Settings** > **Battery**. "Service Recommended" = plan a service. |
| **Windows laptop** | Terminal: **powercfg /batteryreport**. Compare Full Charge to Design Capacity. |
| **Apple Watch** | **Settings** > **Battery** > **Battery Health**. |

## Charging protections to leave on

| Device | Setting |
|---|---|
| **iPhone** | Optimized Battery Charging; Charge Limit on iPhone 15 and later. |
| **Pixel** | Battery health > Charging optimization: Adaptive Charging or Limit to 80%. |
| **Samsung** | Battery > Battery protection. |
| **Mac** | Optimized Battery Charging; Charge Limit on Apple silicon with macOS Tahoe 26.4 or later. |
| **Apple Watch & AirPods** | Optimized charging, on by default. |

## Write it down once

| Keep handy | |
|---|---|
| **My phone model** | _____ |
| **Battery health when I checked / date** | _____ |
| **My laptop model** | _____ |
| **Protection plan (AppleCare+, Pixel Care+, Samsung Care+)** | _____ |
| **Nearest battery drop-off spot** | _____ |
| **Bill's number** | (330) 200-8042 |

## When something's wrong, in order

1. Swollen, hot, smelly or smoking? Stop charging, stop using, move it to a hard surface. Smoke or fire: call 911.
2. Dies too fast? Check the health screen (Part 2).
3. Health is fine? Check battery usage for a hungry app (Part 4).
4. Shut off in the cold? Warm it up. It's temporary (Chapter 19).
5. Hot and slow? Get it out of the sun and the case, and let it cool (Chapter 20).
6. Health below 80% or a service message? Get an estimate from the maker (Chapter 22).
7. Old batteries? Tape the ends and take them to a drop-off spot, never the trash (Chapter 25).
8. Unsure? Call Bill at (330) 200-8042.

SCAM ALERT

### The golden rule

No real company calls or texts out of the blue about your battery and asks for gift cards, a card number or remote access. When in doubt, hang up and call the maker on a number you looked up yourself.