



Up to 18% better performance

Based on PassMark PerformanceTest 11.0 scores

The HP EliteBook 845 G10 with AMD Ryzen 7 PRO 7840U processor: Improve performance plugged in or unplugged and get longer battery life

Compared to the previous-generation HP EliteBook 845 G9

Whether your company is deciding on a new laptop purchase or considering refreshing employees' existing systems, investing in new devices can have a positive impact on productivity, user experience, and battery longevity. If your organization is already enjoying the use of HP EliteBook 845 G9 laptops, updating to the newest G10 systems with the latest processor technology can make your experience even better, as our test results show.

At Principled Technologies (PT), we used industry-standard benchmarks to compare multiple types of plugged-in and unplugged system performance in addition to battery life on a latest-gen HP EliteBook 845 G10 PC powered by an AMD Ryzen™ 7 PRO 7840U processor and a previous-gen model with an AMD Ryzen™ PRO 6850U processor. In addition, we examined how hot and loud each became while running a CPU-intensive workload. We found that the HP EliteBook 845 G10 powered by an AMD Ryzen™ 7 PRO 7840U processor improved upon the previous generation HP EliteBook 845 G9 on system performance, thermal and acoustic output, and battery life.

Get over 2 ½ hours more battery life

Based on MobileMark 25 results when set to Best Performance

Cooler than the older version (literally)

up to 10 degrees cooler based on hot-spot temp load

What we tested

Before we started testing, we set both 14-inch Notebook PCs to “best performance” power mode. We ran the performance benchmarks in best performance mode and ran the battery life tests in both best performance and best battery life modes. We also set screen brightness to 200 nits for the MobileMark® 2018 battery life tests and 250 nits for the MobileMark 25 battery life tests. Other than making and verifying those changes, we used out-



HP EliteBook 845 G10 Notebook PC

AMD Ryzen™ 7 PRO 7840U processor (3.3 – 5.1 GHz)
with Radeon™ graphics

8 cores with 16 threads

32 GB of dual-channel DDR5 memory

512 GB of PCIe® NVMe® SSD storage (Gen 4)

51Whr battery



HP EliteBook 845 G9 Notebook PC

AMD Ryzen™ 7 PRO 6850U processor (2.7 – 4.7 GHz)
with Radeon™ graphics

8 cores with 16 threads

32 GB of dual-channel DDR5 memory

512 GB of PCIe NVMe SSD storage (Gen 3)

51Whr battery

of-box OEM performance settings.

We ran the following performance-based benchmarks:

- PassMark PerformanceTest 11
- Cinebench R23 (Multi-core and Single-core)
- 3DMark® Fire Strike
- 3DMark Time Spy
- Procyon® Office Productivity Benchmark
- Procyon Video-Editing Benchmark

For our surface temperature tests, we ran a sustained CPU-intensive Cinebench R23 workload for 50 minutes, taking keyboard and bottom hot spot temperature readings every 10 minutes. We then ran the CPU-intensive Cinebench R23 workload again for 20 minutes to record how much noise each device’s fan produced under load. The benchmark, thermal, acoustic, and battery life results we report reflect the specific configurations we tested. Any difference in configurations, as well as screen brightness, network traffic, and software additions, can affect these results. For a deeper dive into our testing parameters and procedures, see the [science behind the report](#).

Productivity benchmarks: Get better performance plugged in or unplugged

Laptops are tools meant to help productivity, not hamper it—and this should apply whether your employees typically use their systems plugged in at a desk or if they're on the go and running on battery power. Selecting a system that has top performance on multiple kinds of workloads—and doesn't sacrifice that performance when you unplug it—can make the workday go more smoothly for your hybrid workforce.

On a variety of industry-standard performance benchmarks we tested, the HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor achieved higher scores than the previous-generation HP EliteBook 845 G9. It also maintained strong performance when we unplugged it, making it a versatile system that can help employees get the performance they're used to even when they're away from their desk.

About the HP EliteBook 845 G10 Notebook PC

According to HP, this 14-inch, next-gen 805 Series PC is equipped for hybrid flexibility and premium collaboration with next-gen processors, HP Presence, and enterprise-ready security and manageability.¹

To learn more about the HP EliteBook 845 G10 Notebook PC, visit the HP website: hp.com/amd.

About the AMD Ryzen™ 7 PRO 7840U processor

This next-gen high-end laptop processor is part of AMD Zen 4 architecture. The PRO designation provides access to additional enterprise-level security, manageability, and reliability features for employees, professional users, and workstation environments.² The Ryzen™ 7 PRO 7840U model has 8 cores with 16 threads and includes integrated AMD Radeon™ graphics, PCIe 4.0 connectivity, and AMD Enhanced Virus Protection (NX Bit).³



Boost general performance

We tested using PassMark PerformanceTest 11.0, which combines CPU, disk, memory, and 2D/3D graphics performance metrics into an Overall PassMark rating. Higher PassMark rating numbers indicate a faster system.¹¹ Figure 1 compares the PassMark PerformanceTest 11.0 ratings that each of the systems achieved in our tests, using both an overall rating and several subscores. The HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor had an 18 percent higher overall PassMark Rating than the HP EliteBook 845 G9. As the subscores show, newer technology including faster disk speeds with PCIe Gen4, faster memory, and the new processor all contributed to this overall performance boost.

Key takeaways

- The HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor delivered stronger performance across several types of industry standard benchmarks, including up to 17.4 percent better performance on Cinebench R23 Multi-Core while plugged in.
- Performance for the HP EliteBook 845 G10 was more consistent when going from plugged in to unplugged, and delivered stronger unplugged 3DMark Time Spy and Cinebench R23 Multi-Core benchmark performance vs. the G9 system plugged in.

PassMark PerformanceTest 11.0

Higher is better

Overall PassMark Rating



CPU Mark score



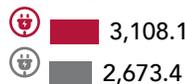
2D Graphics Mark score



3D Graphics Mark score



Memory Mark score



Disk Mark score



Plugged in

HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor

HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor

Up to 18% better
with the HP EliteBook 845 G10

Figure 1: PassMark PerformanceTest 11.0 benchmark results for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better. Source: Principled Technologies.

Another CPU-taxing benchmark is Cinebench R23, which measures general hardware performance by completing common Cinema 4D tasks that tax multiple CPU cores and modern processor features.⁸ On both single-core and multi-core tests, the HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor improved upon the HP EliteBook 845 G9. As Figures 2 and 3 show, the largest performance increase was 17 percent, and there was no meaningful change in performance from plugged in to unplugged.

Cinebench R23 multi-core benchmark

Performance score | Higher is better

HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor



HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor



Plugged in Unplugged

Up to 17% better performance with the HP EliteBook 845 G10

Figure 2: Cinebench R23 Multi-Core benchmark results for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better
Source: Principled Technologies.

Cinebench R23 single-core benchmark

Performance score | Higher is better

HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor



HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor



Plugged in Unplugged

Up to 1.6% better performance with the HP EliteBook 845 G10

Figure 3: Cinebench R23 Single-Core benchmark results for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better
Source: Principled Technologies.

Improve performance for more demanding graphics workloads, too

Not everyone focuses on routine office tasks. Some people may work with graphics, video, or other workflows that tax their laptops more than your average worker. To test the performance of the systems on more demanding workloads, we completed 3Dmark and Cinebench R23 testing, both plugged in and unplugged.

3Dmark focuses on 3D graphic rendering and heavy CPU performance. It includes the following tests that we ran on our systems:

- 3DMark Fire Strike: A DirectX 11 benchmark that “includes two graphics tests, a physics test and a combined test that stresses the CPU and GPU.”⁶
- 3DMark Time Spy: A DirectX 12 test that “supports new API features like asynchronous compute, explicit multi-adapter, and multi-threading.”⁷

As Figures 4 and 5 show, the HP EliteBook 845 G10 Notebook PC with AMD Ryzen™ 7 PRO 7840U processor outperformed the older HP EliteBook 845 G9 on these tests by as much as 13 percent, and had little to no decrease in performance when it ran the benchmark unplugged.

3DMark Fire Strike DX11 overall score

Performance score | Higher is better

HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor



HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor



Plugged in Unplugged

Up to 13.3% better performance with the HP EliteBook 845 G10

Figure 4: 3DMark Fire Strike DX11 benchmark results for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better. Source: Principled Technologies.

3DMark Time Spy DX12 overall score

Performance score | Higher is better

HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor



HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor



Plugged in Unplugged

Up to 13.5% better performance with the HP EliteBook 845 G10

Figure 5: 3DMark Time Spy DX12 benchmark results for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better. Source: Principled Technologies.

Stronger plugged in performance for a variety of tasks

We also compared the HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor and the previous-gen HP EliteBook 845 G9 on several benchmarks only while they were plugged in.

Not all office user tasks are the same. Looking at scores for many targeted real-world applications can give users confidence that these results might apply to their specific workload(s) of interest. The Procyon Office Productivity Benchmark “uses Microsoft Office applications to measure Windows PC and Apple Mac performance in office productivity tasks. The benchmark workloads are built on relevant, real-world tasks using Microsoft Word, Excel, PowerPoint and Outlook.”⁹ As Figure 6 shows, the HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor delivered a 9 percent higher overall rating than the HP EliteBook 845 G9 did.

Procyon Office Productivity Benchmark

Performance score | Higher is better

9.1% better Overall Rating
with the HP EliteBook 845 G10

Office Productivity Overall Rating



PowerPoint Score



Word Score



Outlook Score



Excel Score



Plugged in

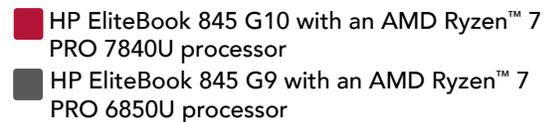


Figure 6: Procyon Office Productivity benchmark results for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better. Source: Principled Technologies.

Video editors and other creators can also see stronger performance with the new HP EliteBook 845 G10. We ran the Procyon Video Editing Benchmark, which “uses Adobe Premiere Pro in a typical video editing workflow. Using relevant apps ensures that the benchmark score reflects the real-world performance of the whole system.”¹⁰ As Figure 7 shows, the HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor achieved a 12 percent higher Procyon Video Editing Benchmark score than the older HP EliteBook 845 G9 did.

Procyon Video Editing score

Performance score | Higher is better

12.4% better
with the HP EliteBook 845 G10

HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor



HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor



Plugged in

Figure 7: Procyon Video Editing benchmark results for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better. Source: Principled Technologies.

Battery life: Extend your time on the go by over 2.5 hours

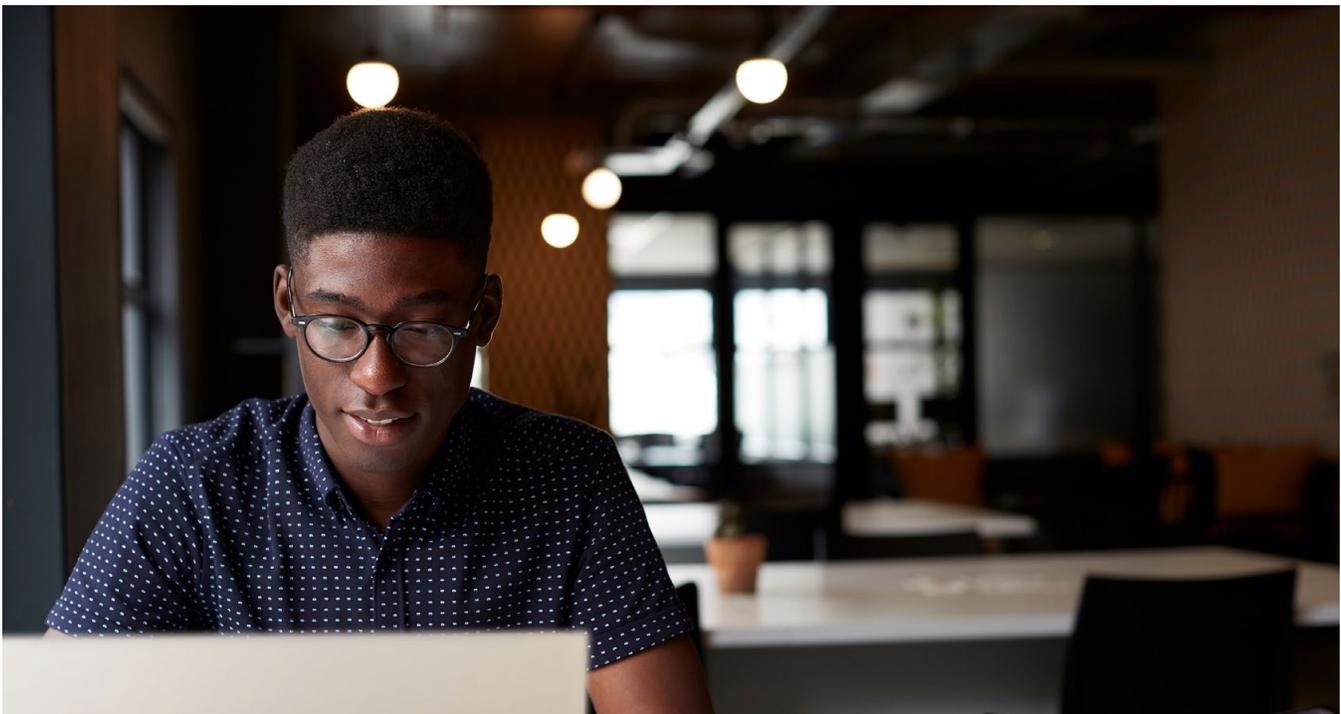
Giving employees laptops with better battery life gives them the freedom to work where they want (or need to): the park on a nice day, the local ice rink during their kid's hockey practice, or the train as they commute to or from the office. Extending the time they can be away from their desks without worrying about a shutdown can give employees peace of mind and boost productivity.

For battery life testing, we used two different benchmarks. First, we used MobileMark 2018, which measures battery life and performance at the same time. It uses real applications, workloads, and data sets to quantify how overall system performance affects the user experience.¹² Then, we ran MobileMark 25, which uses scenarios based on the real-world applications and activities business users encounter every day.¹³ We ran both benchmarks across two scenarios: best battery life and best performance.

As Figures 8 and 9 show, the HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor offered generally better battery life than did the older HP EliteBook 845 G9. On MobileMark 25 best performance tests, the HP EliteBook 845 G10 extended battery life over the previous-generation system by over 2.5 hours, which means that users could go about their day with less worry over finding a place to plug in. On MobileMark 2018 prioritizing best battery life, the older system had slightly longer battery life than the newer system, but did not perform as well. On MobileMark 25 prioritizing battery life, the newer system achieved slightly lower performance qualification scores while achieving slightly longer battery life.

Key takeaways

- The HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor extended battery life by nearly 3 hours compared to the older HP EliteBook 845 G9 on MobileMark 25 tests prioritizing best performance.
- The HP EliteBook 845 G10 delivered up to 35 percent longer battery life than the previous-generation system.



MobileMark 2018

Higher is better

Best Battery Life

Battery life (hr:min)



Minutes per WHr



Performance qualification score



Best Performance

Battery life (hr:min)



Minutes per WHr



Performance qualification score



- HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor
- HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor

Up to 2 hours 6 minutes longer battery life with the HP EliteBook 845 G10 (a 26% improvement over the previous-generation model)

Figure 8: MobileMark 2018 battery life benchmark result comparison for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better. Source: Principled Technologies.

MobileMark 25

Higher is better

Best Battery Life

Battery life (hr:min)



Minutes per WHr



DC performance score



MobileMark 25 index



Best Performance

Battery life (hr:min)



Minutes per WHr



DC performance score



MobileMark 25 index



- HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor
- HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor

Up to 2 hours 52 minutes longer battery life with the HP EliteBook 845 G10 (a 35% improvement over the previous-generation model)

Figure 9: MobileMark 25 battery life benchmark result comparison for the HP EliteBook 845 G10 and HP EliteBook 845 G9. Higher numbers are better. Source: Principled Technologies.

Thermal testing: Cooler temps provide a better user experience

When systems perform at a high level, all that processing power creates heat that has to go somewhere. But excess heat can create uncomfortable surfaces for users who keep their hands in typing position or like to rest their laptop on their laps. Laptops that dissipate heat better can keep those areas cool and provide a better overall user experience.

For thermal testing, we ran the demanding Cinebench R23 Sustained performance workload and recorded the temperatures while each system was under load and plugged in. As Figure 10 shows, the HP EliteBook 845 G10 achieved a higher performance score while staying significantly cooler than the older EliteBook 845 G9 in key areas. At the keyboard deck, which users touch with their fingertips, the HP EliteBook 845 G10 was over 5 degrees Fahrenheit cooler (123.3°F/50.7°C vs. 129.2°F/54.0°C) than the EliteBook 845 G9. At the undersides of the laptops, which often rest on users' laps, the HP EliteBook 845 G10 was 10 degrees Fahrenheit cooler (108.5°F/42.5°C vs. 118.8°F/48.2°C) than the EliteBook 845 G9.

Key takeaways

- The HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor was over 10°F cooler on the underside of the laptop compared to the older G9 system.
- The increased performance of the HP EliteBook 845 G10 didn't lead to louder fan noise, clocking in at .5 decibels quieter under load than the EliteBook 845 G9.

Thermal testing during a Cinebench R23 sustained performance workload

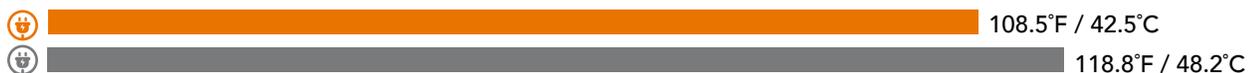
Performance score (Higher is better)



Keyboard deck (Lower is better)



Underside of chassis (Lower is better)



 Plugged in

 HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor
 HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor

Figure 10: Thermal testing results for the HP EliteBook 845 G10 and HP EliteBook 845 G9, while the systems were plugged in. Lower temperatures are better. Source: Principled Technologies.

Acoustic testing: Shh! You're working here

When a user's laptop is processing demanding workloads and the system heats up, the fan charged with cooling it down may make excess noise that can become a distraction. We measured the noise levels that the two laptops emitted 1) while idle and 2) while running a demanding Cinebench R23 multi-core workload. As Figure 11 shows, we found that while idle, the two laptops tied in average decibel levels. Under load, the HP EliteBook 845 G10 Notebook PC with AMD Ryzen™ 7 PRO 7840U processor was on average .5 decibels quieter than the HP EliteBook 845 G9 over the course of the test.

Acoustic performance during a sustained Cinebench R23 workload

System idle (dBA) average • System under Cinebench R23 load | Lower is better

System idle – Average dBA



System under Cinebench load – Average dBA

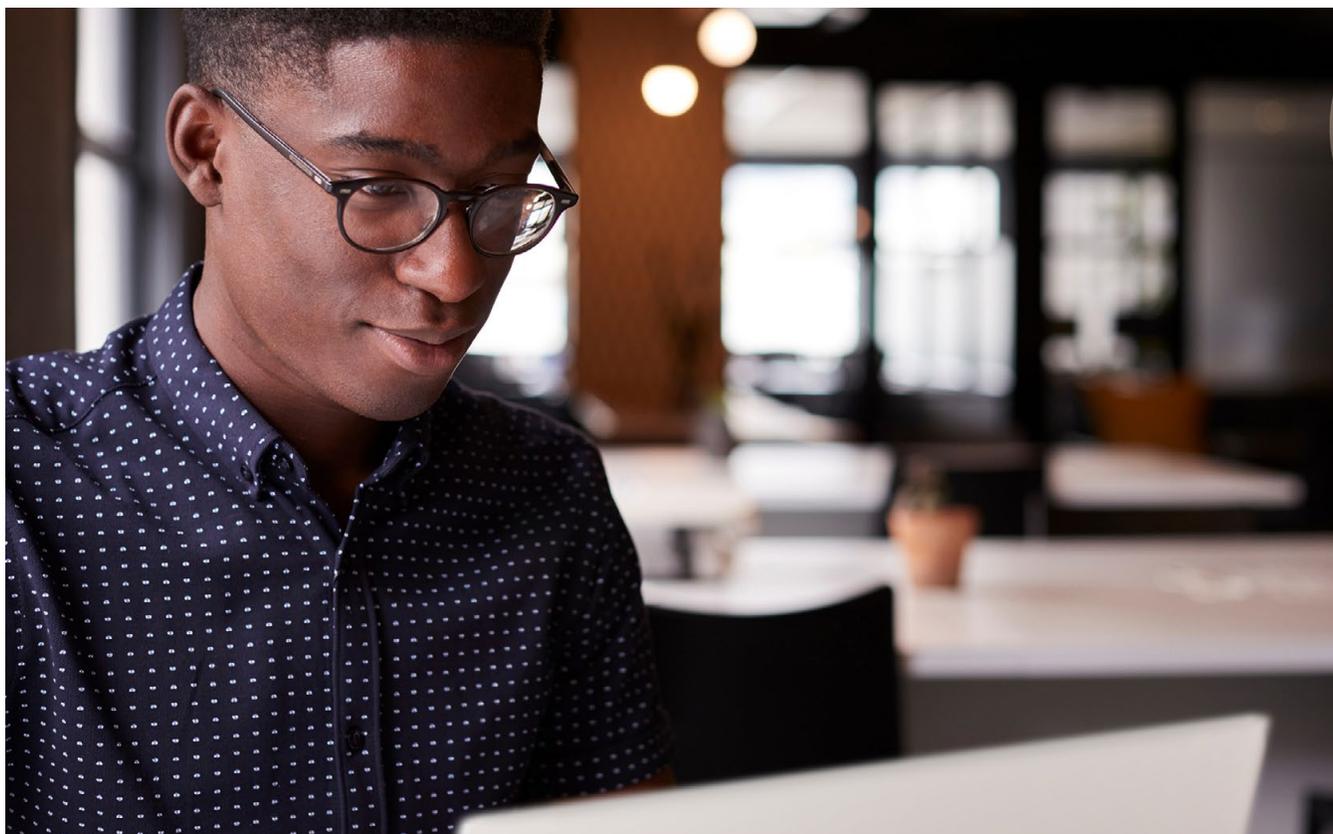


 Plugged in

 HP EliteBook 845 G10 with an AMD Ryzen™ 7 PRO 7840U processor

 HP EliteBook 845 G9 with an AMD Ryzen™ 7 PRO 6850U processor

Figure 11: Acoustic testing results for the HP EliteBook 845 G10 and HP EliteBook 845 G9, while the systems were plugged in. Lower numbers are better. Source: Principled Technologies.



Conclusion

Equipping your team with new laptops can help them navigate their daily routines quicker and easier, improve their user experience, and give them more options when it comes to working unplugged.

Our hands-on tests showed that the HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor offered stronger, more consistent benchmark performance while plugged in and unplugged compared to the older HP EliteBook 845 G9. And, the HP EliteBook 845 G10 stayed significantly cooler in the hot spots we compared (under-chassis and keyboard) and emitted the same or less noise than the G9 system. Finally, HP EliteBook 845 G10 with AMD Ryzen™ 7 PRO 7840U processor offered 2.5 hours longer battery life compared to the previous-gen HP EliteBook 845 G9. The improved performance, lower heat and noise, and longer battery life that the HP EliteBook 845 G10 delivers all provide good reasons for selecting these laptops with the latest AMD Ryzen™ 7 PRO 7840U processor for the employees in your organization.



1. HP, "HP Leads in Hybrid Work with Future-Ready Portfolio," accessed September 21, 2023, <https://press.hp.com/us/en/press-releases/2023/hp-unleashes-future-ready-portfolio.html>.
2. Notebookcheck, "AMD Ryzen™ 7 PRO 7840U," accessed September 21, 2023, <https://www.notebookcheck.net/AMD-Ryzen-7-PRO-7840U-Processor-Benchmarks-and-Specs.725652.0.html>.
3. AMD, "AMD Ryzen™ 7 PRO 7840U," accessed September 21, 2023, <https://www.amd.com/en/product/13481>.
4. BAPCo, "CrossMark," accessed September 21, 2023, <https://bapco.com/products/crossmark/>.
5. BAPCo, "SYSmark25," accessed September 18, 2023, <https://bapco.com/products/sysmark-25/>.
6. 3DMark, "Fire Strike," accessed September 12, 2023, <https://benchmarks.ul.com/3dmark>.
7. 3DMark, "Time Spy," accessed September 12, 2023, <https://benchmarks.ul.com/3dmark>.
8. Maxon, "Cinebench R23," accessed September 12, 2023, <https://www.maxon.net/en/cinebench>.
9. UL Solutions, "Procyon Office Productivity Benchmark," accessed September 21, 2023, <https://benchmarks.ul.com/procyon/office-productivity-benchmark>.
10. UL Solutions, "UL Procyon Video Editing Benchmark," accessed September 13, 2023, <https://benchmarks.ul.com/procyon/video-editing-benchmark>.
11. PassMark Software, "PerformanceTest FAQ – What Do All These Numbers Mean?" accessed September 13, 2023, https://www.passmark.com/support/performance_test_faq/understanding-results.php.
12. BAPCo, "BAPCo® MobileMark® 2018 White Paper," accessed September 11, 2023, https://bapco.com/wp-content/uploads/2018/12/MobileMark_2018_White_Paper_v0.1.pdf.
13. BAPCo, "MobileMark® 25," accessed September 11, 2023, <https://bapco.com/products/mobilemark-25/>.

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