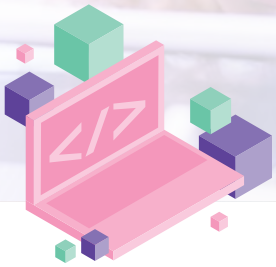
Review shared data sooner

20% less time to open a Microsoft Excel spreadsheet in Microsoft Teams

Edit batches of photos faster

21% less time to complete an Adobe Lightroom Classic workflow



Develop Linux kernels more quickly

38% less time to compile a Linux kernel

Comparing Intel Core i5 H-class vs. Intel Core i5 U-class processors: Dell Latitude 5511 vs. Dell Latitude 5510

Finish compute-intensive tasks faster with the Intel Core i5-10400H processor-powered Dell Latitude 5511

Like most of the US labor force,[1] you probably work remotely. If your workflow involves CPU-intensive tasks, the laptop you use in your home office can make a significant difference in how much you can do in a business day or week. Finishing tasks in Microsoft Excel more quickly, for example, could open your schedule to more projects and help you meet client deadlines sooner.

At Principled Technologies, we tested the performance of the Intel® Core™ i5-10400H processor-powered Dell Latitude™ 5511 and the Intel Core i5-10310U processor-powered Dell Latitude 5510 with productivity and compute-intensive tasks. Although both mainstream business laptops performed well, the Intel Core i5 H-series processor-based laptop completed the tasks in less time and delivered better scores from benchmarking tools.

Boost performance of various compute-intensive and productivity applications

Just a little more processing power from your laptop can save you time and let you do more with your day. We completed tasks faster and achieved higher benchmark scores with the Intel Core i5-10400H processor-powered laptop than the Intel Core i5-10310U processor-based laptop.

We categorize our tests into three user-based task categories:

- **General productivity:** This category is for the many people who use Microsoft 365 productivity software and web applications, perform browser-based tasks, and collaborate with team members. These people work in industries such as finance, technology, consulting, and healthcare, among others.
- **Media-centric:** People who create visual and audio content might need to do the tasks in this category regularly. These roles might include videographers, designers, photojournalists, photographers, sound engineers, music producers, and other similar creators.
- **Compute-intensive:** The tasks featured in this category could be part of developer, engineer, architect, physicist, video game designer, animator, or other workflows. People who work heavily with data, run simulations, develop software, or use engineering applications and frequently share and receive files for these kinds of projects could see speed similar to these results.

For most tests, we provide examples of which kinds of workers the speed and performance advantages might help, but anyone using their system for similar tasks could see these advantages. As shown by the variety of tasks in our testing, many professional users with compute-intensive workflows could check off more items in their to-do lists with the Intel Core i5-10400H processor-powered Dell Latitude 5511.

You can find all of our results from testing in the science behind this report.

About 10th Gen Intel Core H-series processors

According to Intel, the 10th Gen Intel Core H-series mobile processor family offers "real-world performance that matters – incredible, high fps gaming and precious time-saving content creation, plus exceptional wireless connectivity with the latest integrated Wi-Fi technology (Intel Wi-Fi 62 AX201 Gig+) on the market."[2] All 10th Gen Intel Core i5 H-series processors have four cores and eight threads, which allows laptops to perform multiple actions simultaneously. In addition, 10th Gen Intel Core H-series processors offer Intel Turbo Boost Technology 2.0 and Intel Hyper-Threading Technology, both of which could boost processing speed and efficiency. When running a single core in Turbo Boost mode, Intel claims that 10th Gen Intel Core i5 H-series mobile processors, like the one we tested, can reach speeds up to 4.6 GHz.[3] For more information on 10th Gen Intel Core H-series processors, visit https://www.intel.com/content/www/us/en/products/docs/processors/core/10th-gen-processors.html.

What is the main difference between Intel Core H-series and U-series processors?

According to Intel, the H-series processors are "high performance optimized for mobile" and the U-series processors are "mobile power efficient."[4] Although both processors we tested had four cores and eight threads, they differed in a few ways. Two of the key differences are that the H-series processor has higher processor base frequency and max turbo frequency. "The processor base frequency refers to the CPU's regular operating point, while the Max Turbo Frequency refers to the maximum speed the processor can achieve using Intel® Turbo Boost Technology."[5] Higher frequencies could contribute to better performance. Table 1 compares the differences between the processors:

Table 1: A comparison of differences between the Intel Core i5-10400H processor and the Intel Core i5-10310U processor.

	Intel Core i5-10400H processor	Intel Core i5-10310U processor
Processor base frequency (GHz)	2.60	1.70
Max turbo frequency (GHz)	4.60	4.40
Cache	8 MB Intel Smart Cache	6 MB Intel Smart Cache
Bus speed (GT/s)	8	4
Thermal design power (TDP) (W)	45	15

TDP is the maximum heat, in watts, that a CPU can use. More watts could mean better performance.

General productivity

The tests in this section cover a variety of tasks that show the performance you could expect when running web applications, websites, and Microsoft 365 applications. Social media managers, administrative assistants, and healthcare professionals are just some of the people who could benefit from the time savings and performance gains of the Intel Core i5 H-series processor-powered laptop in these tasks. Figures 1 through 3 highlight the benchmark scores for this category.

BrowserBench is a suite of benchmarks that demonstrate speed, responsiveness, and graphics performance of web applications. In particular, MotionMark measures how well web browsers can animate complex scenes at a target frame rate. The tool stresses the graphics system, so a higher score can indicate that a system can better handle common rendering techniques used on the internet.

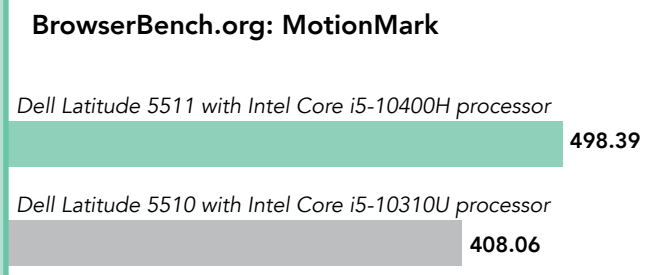


Figure 1: Scores from the BrowserBench.org: MotionMark benchmark tool. Higher is better. Source: Principled Technologies.

You likely handle a multitude of tasks in many applications. As the SYSmark® 2018 output reflects application usage of business professionals, the higher the score, the more likely your system can keep pace with your multi-tasking.

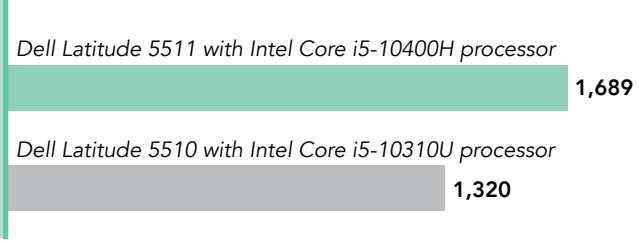


Figure 2: Scores from the SYSmark 2018: Creativity Performance Score benchmark tool. Higher is better. Source: Principled Technologies.

If you're using the internet to conduct research or learn about an important event, a speedier laptop could help you stay in the know. WebXPRT 3 measures the speed of web-connected devices by using workloads that mirror the kinds of things you might do on the internet: enhancing photos, organizing a photo album using AI, pricing stock options, working with local notes, viewing sales data, and doing online homework. The higher the score, the better your system can perform these tasks.

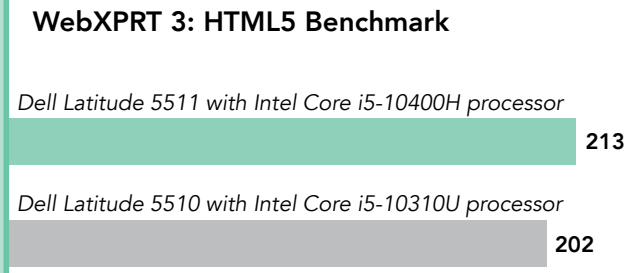


Figure 3: Scores from the WebXPRT 3: HTML5 benchmark tool. Higher is better. Source: Principled Technologies.

Figures 4 through 7 show the speed advantages for the Intel Core i5 H-series processor-based laptop running Microsoft 365 apps.

Lawyers, paralegals, and technical writers
You probably spend a lot of time in Word. The faster you can open and export a document, the sooner you can send it to a partner or colleague for review.

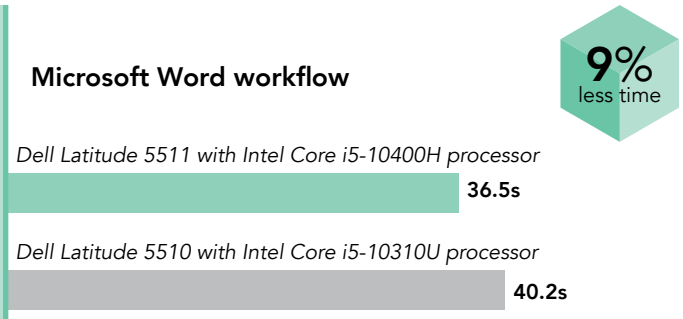


Figure 4: Time in seconds to open a large .docx file and export a large .docx file to PDF. Lower is better. Source: Principled Technologies.

Business analysts, consultants, corporate decision makers, and salespeople
Presentations require a lot of planning and work. Saving time here and there with PowerPoint could allow you one more practice with your killer presentation.

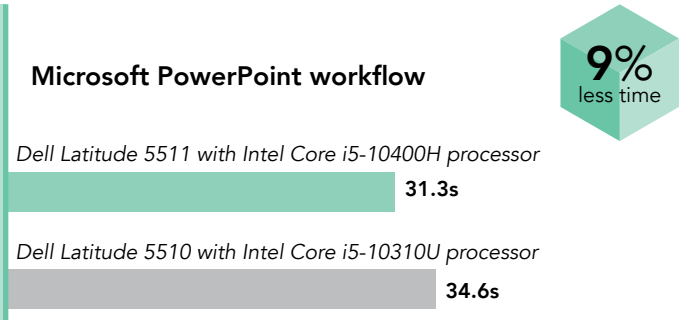


Figure 5: Time in seconds to open a large .pptx file and export a large .pptx file to PDF. Lower is better. Source: Principled Technologies.

Accountants, auditors, day traders, financial analysts, business analysts, and loan officers
The faster you can work with Excel or run Monte Carlo simulations, the sooner you can deliver timely advice to clients or develop a sound strategy.

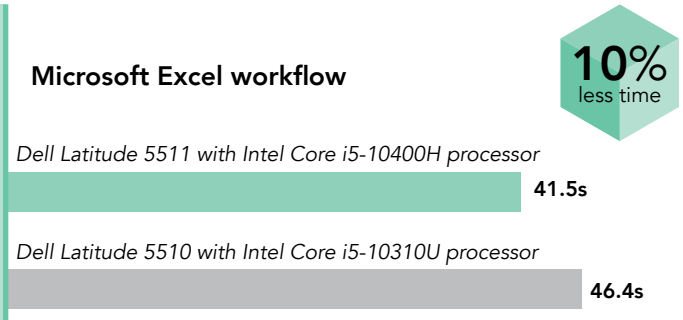


Figure 6: Time in seconds to open a large .xlsm file, export a large .xlsm file to a PDF, and run a Monte Carlo simulation of the Black-Scholes model. Lower is better. Source: Principled Technologies.

Retail store managers
Microsoft Teams allows you to communicate and share data with regional and district managers. Opening Excel spreadsheets more quickly could help your respond to inquiries or find helpful information for your store faster.

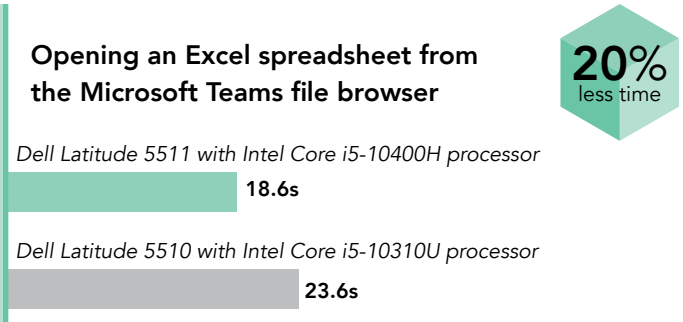


Figure 7: Time in seconds to open an Excel spreadsheet from the Microsoft Teams file browser. Lower is better. Source: Principled Technologies.

Media-centric

If you're a designer, videographer, or other similar creative type, saving time when there's so much work to do could help you meet deadlines sooner and keep clients happy with faster turnaround times. Figures 8 through 11 show that the Intel Core i5 H-series processor-based laptop can finish digital media tasks in less time.

Videographers
Rendering videos can require a lot of compute resources from your laptop for long periods. Faster renders not only allow you to take on more tasks in your day, they can also reduce the stress on the laptop's processor.

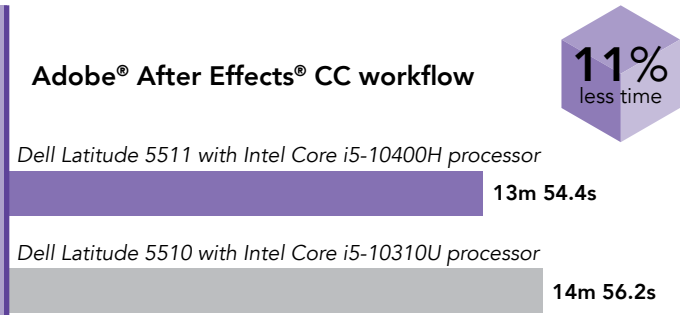


Figure 8: Time in minutes and seconds to launch Adobe After Effects CC and render a five-minute lossless video. Lower is better. Source: Principled Technologies.

Photographers and photojournalists
Imagine you've finished a photo shoot and want to adjust the contrast for all the photos. The sooner you can do this and get to your fine-tuning edits, the sooner you can send them to your client.

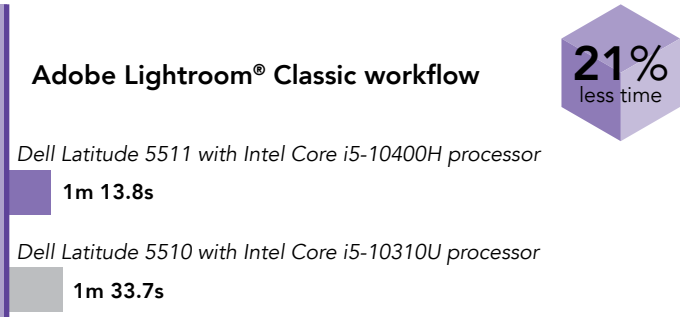


Figure 9: Time in minutes and seconds to launch Adobe Lightroom Classic and batch process 100 RAW photos from a camera. Lower is better. Source: Principled Technologies.

Graphic designers
A tough client just requested a last-minute change to a solution brief, requiring you to redo a skyline panorama. Saving any amount of time in this situation could help maintain a positive relationship with the client.

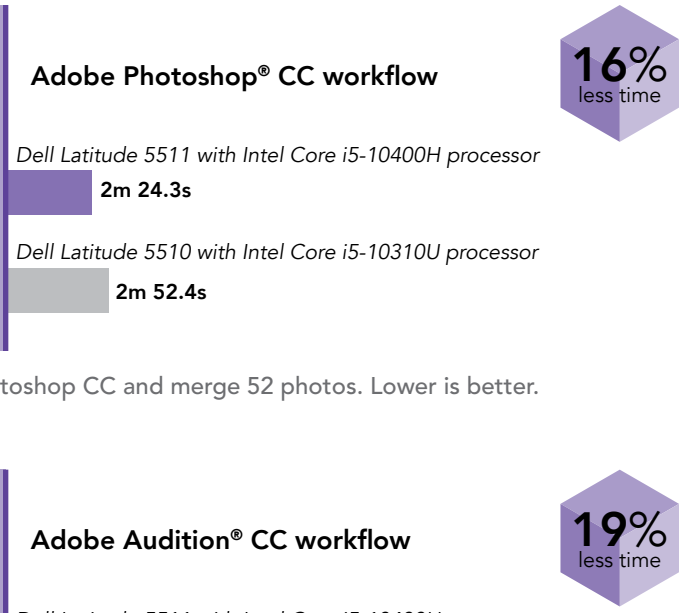


Figure 10: Time in minutes and seconds to launch Adobe Photoshop CC and merge 52 photos. Lower is better. Source: Principled Technologies.

Audio engineer
Post-production audio work can require numerous playbacks after minor tweaks and edits. You could listen to more versions of a podcast or more variations of a jingle and still meet deadlines if you're exporting and opening MP3 files more quickly.

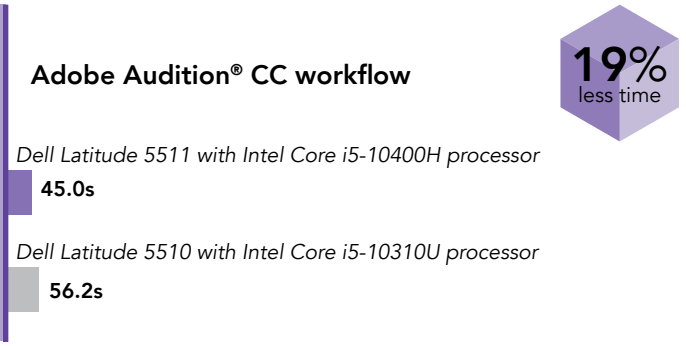


Figure 11: Time in seconds to launch Adobe Audition CC, open a large MP3 file, and export a large MP3 file. Lower is better. Source: Principled Technologies.

Compute-intensive

These tasks aren't for every user, but developers, scientists, and others might perform them frequently. Saving any amount of time on these kinds of tasks can keep simulations or app development moving at a productive pace and ultimately help projects come to completion sooner. Figures 12 through 14 show that the boost in computing power from the Intel Core i5 10400H processor-powered Dell Latitude 5511 can allow people working on compute-intensive tasks to save time in their workflows.

Developers
For those who prefer Linux operating systems, compiling a Linux kernel can be computationally intense. Saving time could allow you to jump into your next project sooner.

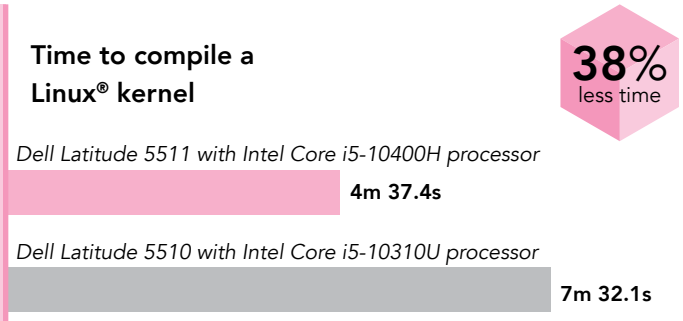


Figure 12: Time to compile a Linux kernel in minutes and seconds. Lower is better.
Source: Principled Technologies.

Scientists, engineers, architects, animators, and video game designers
Ray tracing helps images better mimic the real world, but rendering them can require significant computing power. Rendering these images faster could allow you to complete more computer-generated images in your workday.

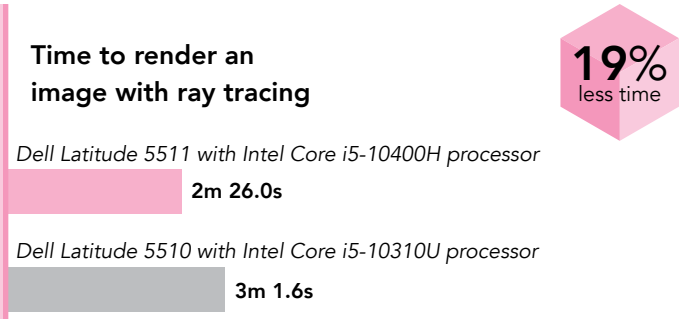


Figure 13: Time to render an image with ray tracing in minutes and seconds. Lower is better.
Source: Principled Technologies.

Developers, scientists, engineers, architects, animators, and video game designers
If tasks in your projects require numerous large files, you might sometimes share zipped files with a colleague. The 7-Zip LZMA benchmark tool reports ratings in million instructions per second (MIPS), and higher scores indicate faster compression and decompression of zipped files, which can help the flow of collaboration.

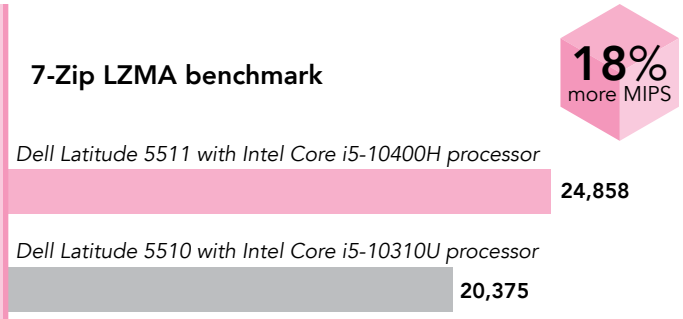


Figure 14: 7-Zip LZMA compression benchmark tool scores in MIPS. Higher is better. Source: Principled Technologies.

Conclusion

Using a faster mainstream business laptop means you can finish more tasks, meet deadlines more easily, and build stronger client relationships. We found the Intel Core i5 10400-H processor-powered Dell Latitude 5511 mainstream business laptop completed numerous tasks in less time than the Intel Core i5-10310U processor-powered Dell Latitude 5510 and scored better on many performance benchmark tools. For compute-intensive workflows at home, the faster, more powerful Intel Core i5 H-processor-based laptop could give you the boost you need to do more.

---

1 Mims, Christopher, "The Work-From-Home Shift Shocked Companies—Now They're Learning Its Lessons," accessed September 10, 2020, https://www.wsj.com/articles/the-work-from-home-shift-shocked-companiesnow-theyre-learning-its-lessons-11595649628.

2 Intel, "10th Gen Intel® Core™ Mobile Processors Product Brief," accessed September 10, 2020, https://www.intel.com/content/www/us/en/products/docs/processors/core/10th-gen-core-mobile-h-processors-brief.html.

3 Intel, "10th Gen Intel Core H-series Introduces the World's Fastest Mobile Processor at 5.3 GHz," accessed September 10, 2020, https://newsroom.intel.com/news/10th-gen-intel-core-h-series-introduces-worlds-fastest-mobile-processor-5-3-ghz/#gs.f78wo0.

4 "Intel® Processor Names, Numbers and Generation List," accessed September 23, 2020, https://www.intel.com/content/www/us/en/processors/processor-numbers.html.

5 "What Is CPU Clock Speed?," accessed September 23, 2020, https://www.intel.com/content/www/us/en/gaming/resources/cpu-clock-speed.html.

Read the science behind this report at http://facts.pt/fJcczYM ►

Principled Technologies®

Facts matter.®

This project was commissioned by Dell Technologies.