28.5% less time to render Tinkercad blocks

for a futuristic city model

vs. the Acer Chromebook Vero 514

11.8% less time to import photos

to Adobe Lightroom

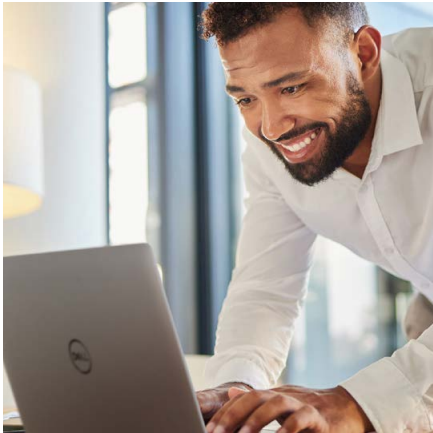*vs. the HP Elite c640 G3 Chromebook*

9.2% faster network speed

in Speedtest download testing

vs. the Acer Chromebook Vero 514

A Dell Latitude 5430 Chromebook achieved performance better than or on par with three competitor Chromebooks

We compared the Dell Latitude 5430 to the Acer Chromebook Vero 514, the ASUS Chromebook CX34 Flip, and the HP Elite c640 G3 Chromebook in benchmark and hand-timed tests

When it's time to choose a Chromebook for work, education, or personal use, there are a host of options. With many attractive possibilities from different companies, it can be difficult to know which Chromebook will meet your performance requirements.

At Principled Technologies, we used hands-on tests to compare four Chromebooks: a Dell Latitude 5430 Chromebook, an Acer Chromebook Vero 514, an ASUS Chromebook CX34 Flip, and an HP Elite c640 G3 Chromebook. We ran productivity scenarios, such as importing photos and launching virtual meetings, and timed how long it took each system to complete these tasks. For another angle on performance, we also ran industry-standard web browsing and network tests. Our test results indicate that the Dell Latitude 5430 Chromebook met or exceeded the performance of the other Chromebooks.

Hand-timed tasks

Rendering with Tinkercad

Autodesk® Tinkercad is a browser-based computer-aided design (CAD) program for 3D design, electronics, and coding. Of the four devices we compared, the Dell Latitude 5430 Chromebook required the least amount of time to render blocks for a 3D city model, saving 7.3 seconds—or taking 28.5 percent less time—compared to the Acer Chromebook Vero 514 (Figure 1). For the second Tinkercad model, a less complex futuristic motorcycle design, each Chromebook took about the same time to render blocks (Figure 2).

Rendering blocks for a futuristic city model
Time (seconds) | Lower is better

Dell Latitude 5430 Chromebook
18.5

Acer Chromebook Vero 514
25.8

ASUS Chromebook CX34 Flip
19.5

HP Elite c640 G3 Chromebook
20.3

Figure 1: Time, in seconds, to render blocks for a futuristic city model in Tinkercad. Less time is better. Source: Principled Technologies.

Rendering blocks for a futuristic motorcycle model
Time (seconds) | Lower is better

Dell Latitude 5430 Chromebook
3.5

Acer Chromebook Vero 514
3.5

ASUS Chromebook CX34 Flip
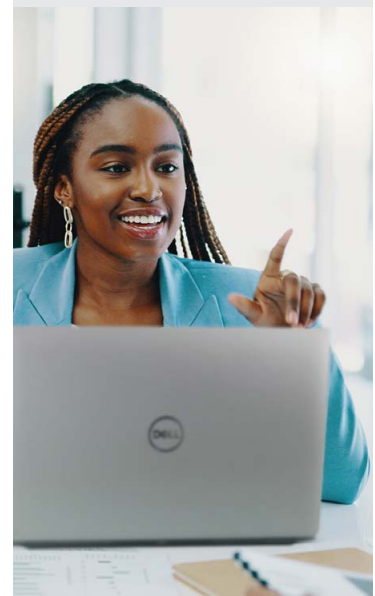3.3

HP Elite c640 G3 Chromebook
3.5

Figure 2: Time, in seconds, to render blocks for a futuristic motorcycle model in Tinkercad. Less time is better. Source: Principled Technologies.

Tinkercad serves as an introduction to tasks that Autodesk, a suite of popular professional CAD programs, supports. According to Tinkercad, more than 50 million people around the world use this free web app.[1]

Working with photos

Whether users are editing photos for a creative project or reviewing images for a marketing campaign, importing, exporting, and unzipping large volumes of photo files can take time and processing power. We hand-timed how long it took to complete such tasks with Adobe® Lightroom®, Adobe Photoshop® Express, and ChromeOS.

The Dell Latitude 5430 Chromebook saved time compared to the HP Elite c640 G3 Chromebook in the Lightroom scenarios, importing a batch of 280 photos in 26 seconds less time, a savings of 11.8 percent. To export the batch, the Dell Latitude 5430 Chromebook needed 13 seconds less time than the HP Elite c640 G3 Chromebook did, a difference of 7.4 percent (Figures 3 and 4). In tests creating a collage with Photoshop Express, each device completed the task in 2.9 seconds (Figure 5). And the Chromebooks unzipped photos in nearly the same amount time (Figure 6).

Importing 280 photos to Adobe Lightroom
Time (mm:ss) | Lower is better

Dell Latitude 5430 Chromebook
3:14

Acer Chromebook Vero 514
3:12

ASUS Chromebook CX34 Flip
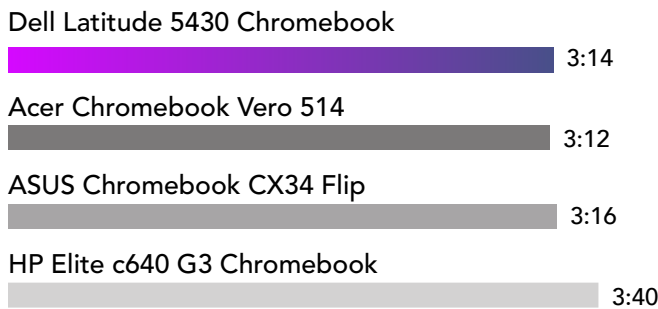3:16

HP Elite c640 G3 Chromebook
3:40

Figure 3: Time, in minutes and seconds, to import 280 JPG photos to Adobe Lightroom. Less time is better. Source: Principled Technologies.

Exporting 280 photos from Adobe Lightroom
Time (mm:ss) | Lower is better

Dell Latitude 5430 Chromebook
2:43

Acer Chromebook Vero 514
2:43

ASUS Chromebook CX34 Flip
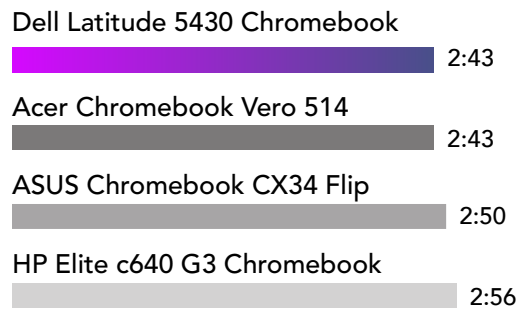2:50

HP Elite c640 G3 Chromebook
2:56

Figure 4: Time, in minutes and seconds, to export 280 JPG photos from Adobe Lightroom. Less time is better. Source: Principled Technologies.

Creating a nine-image collage with Photoshop Express
Time (seconds) | Lower is better

Dell Latitude 5430 Chromebook
2.9

Acer Chromebook Vero 514
2.9

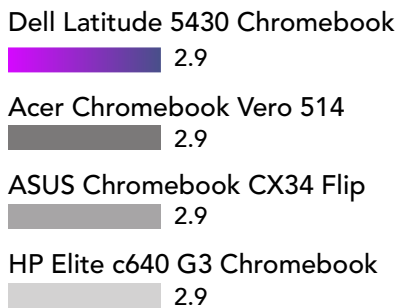ASUS Chromebook CX34 Flip
2.9

HP Elite c640 G3 Chromebook
2.9

Figure 5: Time, in seconds, to create a nine-image collage with Adobe Photoshop Express. Less time is better. Source: Principled Technologies.

Unzipping 280 photos to desktop with ChromeOS
Time (seconds) | Lower is better

Dell Latitude 5430 Chromebook
10.5

Acer Chromebook Vero 514
11.0

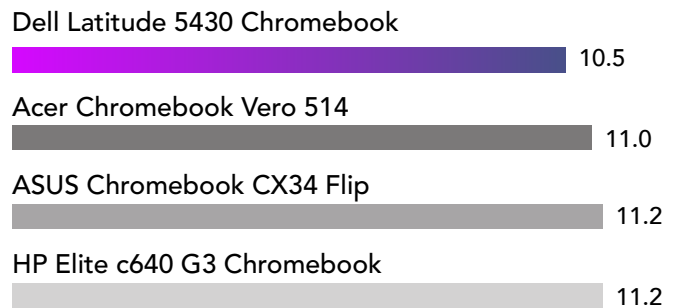ASUS Chromebook CX34 Flip
11.2

HP Elite c640 G3 Chromebook
11.2

Figure 6: Time, in seconds, to unzip 280 JPG photos to desktop with ChromeOS. Less time is better. Source: Principled Technologies.

Everyday productivity tasks

Many office workers and students interact daily with Microsoft Office apps and video-conferencing platforms such as Zoom or Google Meet. In our productivity tests—opening a PowerPoint file and launching virtual meetings—the Dell Latitude 5430 Chromebook delivered performance comparable to the other three Chromebooks (Figures 7 through 9).

Opening a PowerPoint file
Time (seconds) | Lower is better

Dell Latitude 5430 Chromebook
6.4

Acer Chromebook Vero 514
6.5

ASUS Chromebook CX34 Flip
6.4

HP Elite c640 G3 Chromebook
7.3

Figure 7: Time, in seconds, for a 254KB PowerPoint file to load. Less time is better. Source: Principled Technologies.

Launching a Zoom meeting
Time (seconds) | Lower is better

Dell Latitude 5430 Chromebook
3.3

Acer Chromebook Vero 514
4.1

ASUS Chromebook CX34 Flip
3.9

HP Elite c640 G3 Chromebook
3.4

Figure 8: Time, in seconds, to launch a Zoom meeting. Less time is better. Source: Principled Technologies.

Launching a Google Meet instant meeting
Time (seconds) | Lower is better

Dell Latitude 5430 Chromebook
3.4

Acer Chromebook Vero 514
3.3

ASUS Chromebook CX34 Flip
3.4

HP Elite c640 G3 Chromebook
3.3

Figure 9: Time, in seconds, to launch a Google Meet instant meeting. Less time is better. Source: Principled Technologies.

Network speeds

In work and academic settings where users rely on an internet connection for research, collaboration, and project submission, a slow network connection can hamper productivity. To test the networking capabilities of the four Chromebooks, we used Speedtest® by Ookla®, which outputs results in megabits per second (Mbps).

The Dell Latitude 5430 Chromebook was a top performer in terms of both download and upload speed, delivering speeds on par with the HP Elite c640 G3 Chromebook. Compared to the Acer Chromebook Vero 514, the Dell Latitude 5430 Chromebook achieved a 9.2 percent faster download speed and an 8.8 percent faster upload speed (Figures 10 and 11).

Download speed
Mbps | Higher is better

Dell Latitude 5430 Chromebook
195.1

Acer Chromebook Vero 514
178.5

ASUS Chromebook CX34 Flip
189.0

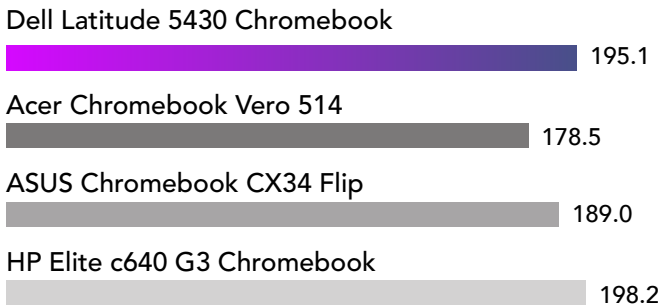HP Elite c640 G3 Chromebook
198.2

Figure 10: Download speed, in megabits per second, as reported by Speedtest. Higher is better. Source: Principled Technologies.

Upload speed
Mbps | Higher is better

Dell Latitude 5430 Chromebook
177.3

Acer Chromebook Vero 514
162.8

ASUS Chromebook CX34 Flip
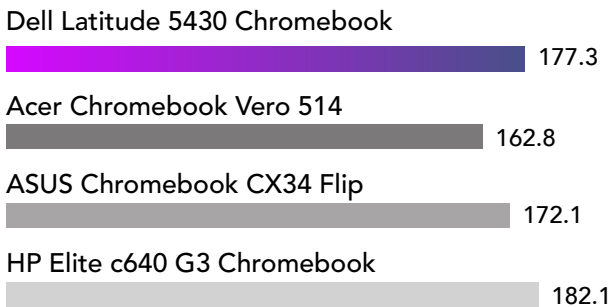172.1

HP Elite c640 G3 Chromebook
182.1

Figure 11: Upload speed, in megabits per second, as reported by Speedtest. Higher is better. Source: Principled Technologies.

Web benchmark tests

Because ChromeOS devices are web-based, better web browsing performance can reduce the slowdowns that interrupt users' workflows. On two web browsing benchmarks, Speedometer and JetStream, we found that the Dell Latitude 5430 Chromebook achieved scores comparable to the other three devices (Figures 12 and 13).

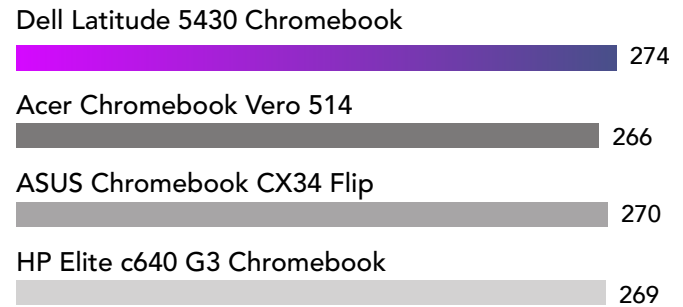## Speedometer 2.0 score
Higher is better

Dell Latitude 5430 Chromebook
274

Acer Chromebook Vero 514
266

ASUS Chromebook CX34 Flip
270

HP Elite c640 G3 Chromebook
269

Figure 12: Speedometer 2.0 scores. Higher is better. Source: Principled Technologies.

JetStream 2 score
Higher is better

Dell Latitude 5430 Chromebook
236.07

Acer Chromebook Vero 514
237.24

ASUS Chromebook CX34 Flip
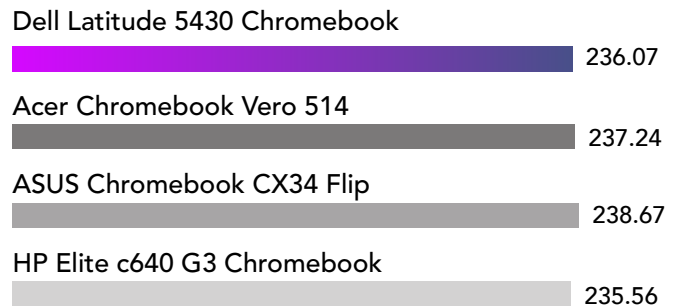238.67

HP Elite c640 G3 Chromebook
235.56

Figure 13: JetStream 2 scores. Higher is better. Source: Principled Technologies.

*An industry-standard network benchmark, **Speedtest by Ookla** asserts, "Every day, over ten million unique tests are actively initiated by our users," and since their founding in 2006, users have run over 45 billion tests.[2]*

***Speedometer 2.0** gauges the responsiveness of web-based applications by simulating user actions in a demo app and measuring the time required to complete those actions.[3]*

***JetStream 2** is a JavaScript and WebAssembly benchmark suite that measures how quickly a browser starts up and executes code, giving higher scores to those that run more smoothly.[4]*

What about serviceability?

Whether users send their device out for repair or take it into a shop, they can face significant expenses when problems occur. Dropping off a device or shipping it out can be a hassle that results in increased downtime. And they can find themselves with no guaranteed return date, which can mean uncertainty and lost productivity.

The Dell Latitude 5430 gives the user more control by allowing them to work on simple service and troubleshooting tasks themselves. Its service manual provides step-by-step illustrated instructions to remove and install hardware components, recover the operating system, run pre-boot diagnostics, and more.[5]

We compared publicly available information on each of the Chromebooks we tested to see which parts a user could replace (Table 1). Acer does not provide a service manual for its Chromebook Vero 514; instead, its safety manual states, "Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks."[6] And while Dell Latitude Chromebook 5430 and the HP Elite c640 G3 Chromebook had nearly the same number of replaceable parts in their service manual, the HP Elite c640 G3 Chromebook manual warns, "Only an authorized service provider should access the components described."[7]

Table 1: Replaceable parts of each Chromebook we tested, based on publicly available information. Source: Principled Technologies.

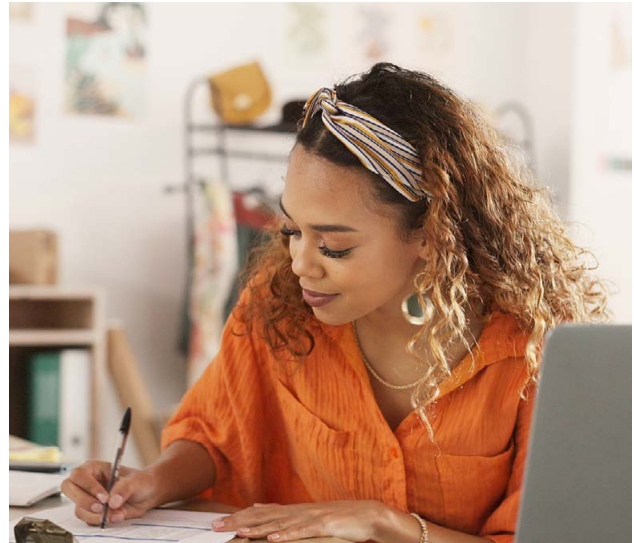| Replaceable component	Dell Latitude 5430 Chromebook[8]	Acer Chromebook Vero 514*	ASUS Chromebook CX34 Flip[9]	HP Elite c640 G3 Chromebook[10]
Base cover	Yes	No information	Yes	Yes**
Wireless card	Yes	No information	Yes	No information
SSD	Yes	Yes[11]	Yes	Yes**
Fan	Yes	No information	Yes	Yes**
Wireless WAN	Yes	No information	No information	Yes**

*No publicly available service manual. The safety guide states, "Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks."[12]
**The service manual states, "Only an authorized service provider should access the components described."[13]

Only the Dell Latitude 5430 Chromebook allowed users to replace all five components we looked at: the base cover, wireless card, SSD, fan, and wireless WAN. With these serviceability capabilities, users could extend the lifespan of their devices, customize their Chromebooks, and reduce downtime waiting on repairs.

Conclusion

We compared the performance of a Dell Latitude 5430 Chromebook, an Acer Chromebook Vero 514, an ASUS Chromebook CX34 Flip, and an HP Elite c640 G3 Chromebook. In hand-timed tests, we found that compared to the other three devices we tested, the Dell Latitude 5430 Chromebook either saved time or took nearly the same time to accomplish Tinkercad, photo, and productivity tasks. It also delivered performance comparable to the other three Chromebooks in network and browser benchmark tests. Taking these results together with its serviceability, when it's time to select a new Chromebook, the Dell Latitude 5430 Chromebook may offer what you seek.

1. "Tinkercad," accessed June 30, 2023, https://www.tinkercad.com/.

2. "Speedtest," accessed June 30, 2023, https://www.speedtest.net/about.

3. "About Speedometer 2.0," accessed June 30, 2023, https://browserbench.org/Speedometer2.0/.

4. "JetStream 2," accessed June 30, 2023, https://browserbench.org/JetStream2.0/.

5. "Latitude 5430 Chromebook Service Manual," accessed July 17, 2023, https://dl.dell.com/content/manu-al21369786-latitude-5430-chromebook-service-manual.pdf?language=en-us.

6. "Regulatory Information and Safety Guide," accessed July 17, 2023, https://global-download.acer.com/GDFiles/Doc-ument/Safety%20Guide/Safety%20Guide_Acer_3.0_A_A.pdf?acerid=637998538041796970&Step1=&Step2=&-Step3=CBV514-1H&OS=ALL&LC=en&BC=ACER&SC=-PA_6.

7. "Maintenance and Service Guide," accessed July 17, 2023, https://kaas.hpcloud.hp.com/pdf-public/pdf_6048310_en-US-1.pdf.

8. "Latitude 5430 Chromebook Service Manual," accessed July 17, 2023, https://dl.dell.com/content/manu-al21369786-latitude-5430-chromebook-service-manual.pdf?language=en-us.

9. "In Search of Incredible – Service Manual," accessed July 17, 2023, https://dlcdnets.asus.com/pub/ASUS/Commer-cial_NB/CX3401FBA/E20690_CX3401FBA_CB3401FBA_SM_WEB.pdf?model=CX3401FBA.

10. "Maintenance and Service Guide," accessed July 17, 2023, https://kaas.hpcloud.hp.com/pdf-public/pdf_6048310_en-US-1.pdf.

11. "Aspire Vero – How to Upgrade / Replace the SSD," accessed July 19, 2023, https://www.youtube.com/watch?v=0CndXe9_9qE.

12. "Maintenance and Service Guide," accessed July 17, 2023, https://kaas.hpcloud.hp.com/pdf-public/pdf_6048310_en-US-1.pdf.

13. "Regulatory Information and Safety Guide," accessed July 17, 2023, https://global-download.acer.com/GDFiles/Doc-ument/Safety%20Guide/Safety%20Guide_Acer_3.0_A_A.pdf?acerid=637998538041796970&Step1=&Step2=&-Step3=CBV514-1H&OS=ALL&LC=en&BC=ACER&SC=-PA_6.

Read the science behind this report at https://facts.pt/OB11s5I ▶

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