Support your small business with an Intel® Core™ i5 processor-powered Chromebook

A Google Pixelbook equipped with an Intel® Core™ i5 processor was faster at office tasks than Chromebooks powered by mid-tier Intel processors

Thanks to their growing popularity, there are tons of Chromebook™ devices on the market for businesses to choose from. Which one is right for you? Generally, the device's processor can tell you a lot about its performance. But how does the processor impact your experience? The answer lies in the device's speed.

We tested three Chromebook devices: one powered by an Intel® Celeron® N3160 processor, another powered by an Intel Core™ m3 processor, and the latest Chromebook from Google, a Pixelbook powered by a fast Intel Core i5 processor. Comparing the two Chromebooks, we found the one powered by an Intel Core m3 processor could save time on everyday office tasks—but the Intel Core i5 processor-powered Pixelbook led the pack, saving time over each of the other devices.

Acer Chromebook R11

Powered by an Intel Celeron N3160 processor

Save over 20 seconds each time you open a Microsoft® PowerPoint® presentation wtih the **Chromebook Pro**

Samsung Chromebook Pro

Powered by an Intel Core m3 processor

Save over 140 seconds each time you export a video with the **Pixelbook**

Google Pixelbook

Powered by an Intel Core i5 processor

The following pages describe a fictional scenario in which people use their Intel processor-powered Chromebooks for everyday small business needs. Though the story is hypothetical, it's based on PT facts. For more detailed testing information, see the appendices beginning on page 8.

Selling a home with help from Intel processor-powered Chromebooks

High school sweethearts Arman and Seina are selling their starter home and moving into a house that could support their family for years to come. The sight of their realtor's Chromebook makes them want to upgrade computers too. See how Rachel's Chromebook help her wow her clients—and find out why even Rachel may consider an upgrade when she gets her hands on a colleague's Google Pixelbook powered by an Intel Core i5 processor.

Acer Chromebook R11

Samsung Chromebook Pro

Google Pixelbook

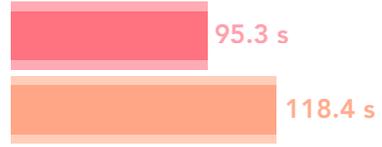**Homeowners**
Arman and Seina

Real estate agent
Rachel

General contractor
Matthew

19% less time

Open PowerPoint™
in Xodo PDF

Time (sec)
lower is better

95.3 s

118.4 s

49% less time

Open Word document
in Xodo PDF

Time (sec)
lower is better

11.6 s

22.7 s

Impress your clients with an Intel Core processor-powered Chromebook

It's a bittersweet day for Arman and Seina as they sit in a realtor's office, reminiscing over old photos of their home on their Intel Celeron N3160 processor-powered Chromebook. The banister they broke moving in. Soft pink sunlight in the kitchen on a Saturday afternoon. As she drags the pictures into their digital scrapbook, Seina thinks maybe it's time for a new Chromebook as well as a new home.

Just then, their prospective real estate agent Rachel arrives for their consultation. The couple puts their memories aside to greet her.

> "Before we start, I just wanted to quickly go over my process...."

Rachel takes out an Intel Core m3 processor-powered Chromebook and pulls up a presentation along with supporting documents. Seina isn't sure, but it *looks* like Rachel's Chromebook opens the documents faster than hers would be able to. For a moment, she thinks about how she's been meaning to look for a newer device, but soon turns her attention back to Rachel.

Rachel walks the couple through the process step by step, circling important sections of her presentation and writing in notes for the couple with her device's stylus. With the procedure out of the way, Rachel closes the presentation and gets to the fun part.

Microsoft® OneNote® and Word

More than 1.2 billion people use products in the Microsoft Office 365™ suite.[1] On the Google Play™ store, Microsoft OneNote is an Editor's Choice app, and both OneNote and Word have over 100 million installs worldwide.[2,3]
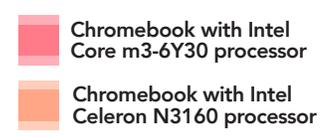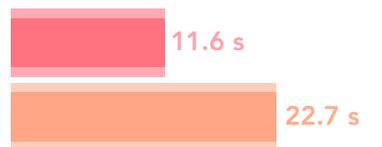
Xodo PDF Reader & Editor

Rating: 4.7/5 stars[4]
Installs: 5 million+[4]

This free app allows users to annotate many types of document, including those from the Microsoft and Google office productivity suites.

Chromebook with Intel Core m3-6Y30 processor

Chromebook with Intel Celeron N3160 processor

Polarr

Rating: 4.3/5 stars[5]

Installs: 1 million+[5]

In November 2017, Android Central named Polarr the best photo editor for Chromebooks.[6] According to Andrew Orr of Tech Dissected, Polarr has most of the features Adobe Lightroom users would be familiar with, and handles crucial RAW files with ease.[7]

Rachel recommends that Arman and Seina get a professional photographer to take shots of their current home. She opens up a few examples of residential photography in her Polarr photo editing app to show them. The photos open quickly, piquing Seina's curiosity once again. But she holds her tongue.

Rachel walks the homeowners through every section of her standard contract to ensure they understand all the details. By the time she reaches the last page, the couple is sold.

"Where do we sign?"

Rachel laughs and tells them to take a day to think it over. She prints out copies of the contract for the couple's records so they can review it later that night.
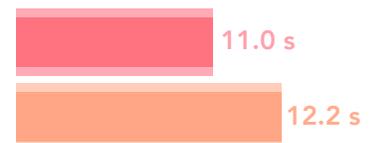
32% less time

Open a photo
in Polarr

Time (sec)
lower is better

6.8 s

10.0 s

10% less time

Preview a document
in Microsoft Word

Time (sec)
lower is better

11.0 s

12.2 s

Chromebook with Intel Core m3-6Y30 processor

Chromebook with Intel Celeron N3160 processor

16% less time

Share a PDF attachment
in Microsoft Word

Time (sec)
lower is better

7.4 s	
8.9 s	

49% less time

Open PowerPoint
in Xodo PDF

Time (sec)
lower is better

48.9 s	
95.3 s	

Get a Pixelbook for even faster performance

Arman and Seina call Rachel the very next day, to formally hire her—and ask about the model of her Chromebook. After a few weeks, the house is inspected and a draft of the listing materials is underway.

Before the listing goes up, Arman and Seina want to make a few small updates to increase their house's marketability. So Rachel calls up a trusted contractor to go over plans for the couple's home.

Matthew the contractor arrives with a Chromebook Rachel hasn't seen before: the Google Pixelbook, powered by an Intel Core i5 processor.

"I got Pixelbooks for our firm just last week," he tells her. "They've already come in handy."

Matthew shares a PDF comparing quotes for some of the house repairs the couple might want—and the attachment loads faster than when Rachel sent PDFs to her clients earlier that day. As they work, Rachel notices other things, like the fact that Matthew's Pixelbook loads PowerPoint documents much faster in Xodo.

Google Photos™

App rating: 4.5/5 stars[8]
Monthly users: 500 million+[8]

Originally an offshoot of the Google+™ social media app, Google Photos has become one of the most widely used apps for storing, sharing, and editing images. With generous storage capacity, plentiful organization options, and the ability to back up and share photos among different devices or with friends, it's no wonder users upload 1.2 billion photos to the service each day.[9]

■	Pixelbook with Intel Core i5-7Y57 processor
■	Chromebook with Intel Core m3-6Y30 processor

WeVideo Video Editor

Rating: 4.1/5 stars[10]
Installs: 5 million+[10]

Featured on tech journalism sites such as TechCruch, Wired, CNET and more, the WeVideo Video Editor enables users to create beautiful videos and sync edits across different devices. In February 2018, the Video Editor app earned the distinction of an Android Excellence App.[11]

"It's great for editing photos too," he tells her, and opens a Panorama view of a property he reviewed last month. In Google Photos, his Pixelbook saves five seconds loading and editing the image.

Rachel tells Matthew about all the video editing her company does to help clients promote their homes.

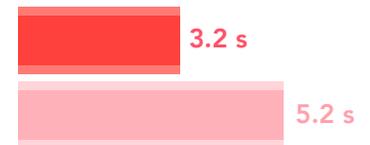> "It would be amazing if the Pixelbook could speed up that process."

Matthew lets Rachel load one of her client's videos in the WeVideo editor. The Pixelbook finishes exporting the video forty seconds sooner than Rachel's own Intel Core m3 processor-powered Chromebook, and nearly two and a half minutes faster than Seina and Arman's Intel Celeron processor-powered Chromebook.

For the rest of the afternoon as they work together, Rachel keeps stealing glances at Matthew's Pixelbook—and thinking about how soon she could get one for her own business.
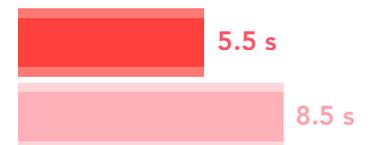
38% less time

Open a 360 panorama
in Google Photos

Time (sec)
lower is better

Pixelbook	3.2 s
Chromebook	5.2 s

35% less time

Save edits to a panorama
in Google Photos

Time (sec)
lower is better

Pixelbook	5.5 s
Chromebook	8.5 s

47% less time

Export an HD video
in WeVideo

Time (sec)
lower is better

Pixelbook	164.6 s
Chromebook	309.8 s

Pixelbook with Intel Core i5-7Y57 processor

Chromebook with Intel Core m3-6Y30 processor

Google Pixelbook Pen

The pressure-sensitive Pixelbook Pen is the only stylus that works with Google Assistant. Hold down the pen's button and the device will send everything you touch to Google Assistant for analysis, giving you fast access to Google's wealth of worldly knowledge.[12]

Conclusion

There may be many Chromebooks for your business to choose from, but one look at the device's processor could help you decide what best fits your needs.

While an Intel Celeron N3160 processor-powered Chromebook provided solid performance, a Chromebook powered by an Intel Core m3 processor excelled at video editing, document sharing, and more. The Intel Core i5 processor-powered Google Pixelbook provided even better performance, which could translate to increased productivity for your small business.

1 "Microsoft by the Numbers," accessed April 3, 2018.
   https://news.microsoft.com/bythenumbers/planet-office

2 "OneNote – Apps on Google Play," accessed April 3, 2018.
   https://play.google.com/store/apps/details?id=com.microsoft.office.onenote

3 "Microsoft Word – Apps on Google Play," accessed April 3, 2018.
   https://play.google.com/store/apps/details?id=com.microsoft.office.word

4 "Xodo PDF Reader & Editor – Apps on Google Play," accessed April 3, 2018.
   https://play.google.com/store/apps/details?id=com.xodo.pdf.reader

5 "Polarr Photo Editor – Apps on Google Play," accessed April 3, 2018.
   https://play.google.com/store/apps/details?id=photo.editor.polarr&hl=en

6 Jerry Hildenbrand, "Best photo editor for your Chromebook," accessed April 3, 2018.
   https://www.androidcentral.com/best-photo-editor-your-chromebook

7 Andrew Orr, "Polarr For Chrome Is A Worthy Alternative To Lightroom," accessed April 3, 2018.
   https://techdissected.com/google/chrome/polarr-for-chrome-is-a-worthy-alternative-to-lightroom/

8 "Google Photos - Android Apps on Google Play," accessed April 3, 2018.
   https://play.google.com/store/apps/details?id=com.google.android.apps.photos

9 Lucas Matney, "Google has 2 billion users on Android, 500M on Google Photos," accessed April 3, 2018.
   https://techcrunch.com/2017/05/17/google-has-2-billion-users-on-android-500m-on-google-photos/

10 "Video Editor – Apps on Google Play," accessed April 3, 2018.
   https://play.google.com/store/apps/details?id=com.wevideo.mobile.android

11 "WeVideo Awarded as Android Excellence App by Google," accessed April 3, 2018.
   http://www.prweb.com/releases/2018/02/prweb15220090.htm

12 "Google Pixelbook Pen with Google Assistant – Google Store," accessed April 3, 2018.
   https://store.google.com/us/product/google_pixelbook_pen?hl=en-US

On September 4, 2018, we finalized the hardware and software configurations we tested. Updates for current and recently released hardware and software appear often, so unavoidably these configurations may not represent the latest versions available when this report appears. For older systems, we chose configurations representative of typical purchases of those systems. We concluded hands-on testing on September 7, 2018.

Appendix A: System configuration information

System	Google Pixelbook	Samsung Chromebook Pro	Acer Chromebook R 11
Processor	Intel Core i5-7Y57	Intel Core m3-6Y30	Intel Celeron N3160
Processor freq (GHz)	1.2–3.3	0.9–2.2	1.6–2.24
Processor cores	2	2	4
Memory (GB)	8	4	4
Storage (GB)	128	32	32
Battery type	Li-Ion	Li-Ion	Li-Ion
Battery capacity (Wh)	41	39	32
Display dimensions	12.3"	12.3"	11.6"
Display resolution	2400 x 1600	2400 x 1600	1366 x 768
Wireless	802.11 AC	802.11 AC	802.11 AC
Bluetooth	4.0	4.0	4.0
USB ports	2 x USB-C	2 x USB-C	1 x USB 3.0, 1 x USB 2.0
System weight (lbs.)	2.4	2.4	2.7
OS (version)	67.0.3396.99	68.0.3440.118	68.0.3440.118
Build/firmware	Eve.9584.107.0	Caroline.7820.356.0	Cyan.7287.57.165

Appendix B: How we tested

Creating the background workload

To simulate typical Chromebook use, we ran a combination of news, email, chat, document viewing, music, and social media websites in the background. For websites that required accounts, we created test profiles and logged in the users on each device.

1. From the shelf, open Chromebook settings.
2. Navigate to the On Startup section of the settings, and select Open a specific page or set of pages.
3. Insert the following URLs, and click OK.

   - forbes.com
   - markets.ft.com/data
   - arstechnica.com
   - mail.google.com
   - slack.com
   - drive.google.com
   - docs.google.com
   - youtube.com/feed/music
   - sheets.google.com
   - twitter.com
   - facebook.com

4. Restart the Chromebook. Before testing, navigate through each tab to ensure that each device has fully loaded the same content.

Testing each application

Microsoft OneNote

Inserting an image into a note

1. Install OneNote from the Google Play Store, and pin the app to the shelf.
2. Launch the app from the shelf.
3. From the default note, click the Insert tab.
4. Click Pictures.
5. Click Image from gallery.
6. Select the test image.
7. Start the timer, and click Open.
8. When the image fully loads into the note, stop the timer.

Microsoft Word

Previewing a 14MB file for print

1. Install Word from the Google Play store, and pin the app to the shelf.
2. Launch the app from the shelf.
3. Click Open other documents.
4. Click This device, and navigate to the Download folder.
5. Click to open the test document.
6. Click File.
7. Start the timer, and click Print.
8. When the print preview fully loads, stop the timer.

Opening the document history

1. Launch the app from the shelf.
2. From the recent documents list, open the test document.
3. Click File.
4. Start the timer, and click History.
5. When the document history fully loads, stop the timer.

Sharing a document as PDF attachment

1. Launch the app from the shelf.
2. Click Open other documents.
3. Click This device, and navigate to the Download folder.
4. Click to open the test document.
5. Click File.
6. Click Share.
7. Start the timer, and click PDF.
8. When the Saved dialog appears, stop the timer.

Xodo PDF Viewer & Editor

Opening a PPTX file

1. Install Xodo PDF Viewer & Editor from the Google Play store, and pin the app to the shelf.
2. Launch the app from the shelf.
3. From the download folder, start the timer, and click the test PPTX.
4. When the PPTX file fully loads, stop the timer.
5. From the documents tab, close the PPTX file.

Opening a DOCX file

1. Launch the app from the shelf.
2. From the download folder, start the timer, and click the test DOCX.
3. When the DOCX file fully loads, stop the timer.
4. From the documents tab, close the DOCX file.

WeVideo

Rendering a GoPro video in HD

1. Install WeVideo from the Google Play store, and pin the app to the shelf.
2. Launch the app from the shelf.
3. Click the blue plus icon.
4. Click Gallery.
5. To enable access to device media storage, click Allow.
6. From the folder browser, select the test footage, and click the green checkmark icon.
7. Click the paper airplane icon.
8. Start the timer, and click Save with watermark.
9. When the saving completes, stop the timer.

Polarr

Opening a photo

1. Install Polarr from the Google Play store, and pin the app to the shelf.
2. Launch the app from the shelf.
3. Click Open photos.
4. Click the Download folder.
5. Start the timer, and click the test image.
6. When the image fully loads into Polarr, stop the timer.

Google Photos

Opening a 360° panorama photo

1. Install Photos from the Google Play store, and pin the app to the shelf.
2. Launch the app from the shelf.
3. From the recent files, select the 360° panorama test image.
4. When the image preview loads, start the timer, and click the 360° icon.
5. When the panorama fully loads, stop the timer.

Saving edits to 360° panorama photo

1. Launch the app from the shelf.
2. Click the menu icon in the top left, and click Device Folders.
3. From Photos on device, click the Download folder.
4. To bring up the panorama, click the test image.
5. To bring up the editing menu, click the sliders icon in the bottom-middle of the app.
6. From the editing menu, click the Alpaca preset.
7. Start the timer, and click Save.
8. When the word "Saved" appears in the bottom middle of the screen, stop the timer.

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