



New Chromebooks with AMD A4-9120C processors handled common education tasks with ease

The AMD A4-9120C processor-powered HP Chromebook 11A and Acer Chromebook Spin 311 provided a comparable experience on 12 education apps compared to an HP Chromebook 11A and Acer Chromebook Spin 11 powered by Intel Celeron N3350 processors

Students use their school-issued Chromebooks™ for everything: they create and edit documents, record audio and video for presentations, and even create engineering models. The Chromebooks you select for your school or district need to keep pace with students, providing them a stable, responsive platform that facilitates learning. Now that AMD is entering the Chromebook market, how do two Chromebooks with AMD A4-9120C processors, the HP Chromebook 11A and Acer Chromebook Spin 311, compare to the versions of those devices that come with Intel® Celeron® N3350 processors?

We ran productivity and education apps on the new HP Chromebook 11A and Acer Chromebook Spin 311, both of which feature AMD A4-9120C processors, to find out. After running through common tasks on 12 popular applications and measuring performance with industry-standard benchmarks, we found that the two AMD A4-9120C processor-powered Chromebooks we tested completed tasks in about the same time as the Intel Celeron N3350-based HP Chromebook 11A and Acer Chromebook Spin 11, providing a similar experience. In some use cases, such as loading and previewing large documents in G Suite apps, the AMD A4-9120C-powered Chromebooks shaved as much as 23 seconds off the task, which could make class go a little smoother.

So don't let the fact that Chromebooks haven't featured AMD processors before concern you—our real-world tests show that the AMD A4-9120C processor-powered HP Chromebook 11A and Acer Chromebook Spin 311 handled 12 common education apps just as well as the HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors. With strong performance confirmed, you can consider other factors when making your investment, including budget, availability, and more.



**STRONG,
COMPARABLE
EXPERIENCE**
on 12 education apps



**SAVE UP TO
23 SECONDS**
when loading a large
file in Google Docs

Picking the right Chromebooks for your school

Schools across the globe are teeming with Chromebooks: Google reports that as of January 2018, more than 25 million teachers and students use them.¹ As we integrate technology more fully with our lives, the number of devices will surely continue to grow.

What makes a Chromebook the right fit for your school? For starters, it must be powerful enough to let students use the apps they need to complete lessons without extra lag or hassle. It's hard enough to keep students on task without the distractions that come from waiting on technology. Next, it should have the features, ports, and form factor that will serve your students well. And finally, it has to fit into your school's ever-shrinking budget.

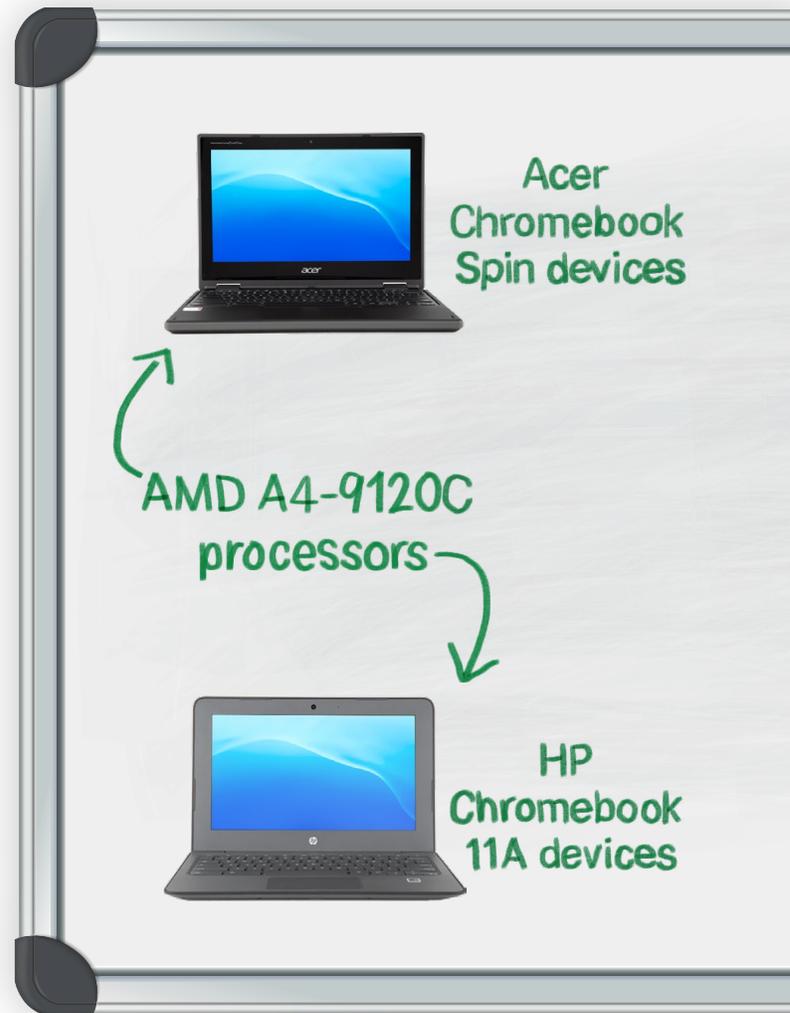
When something new comes to market, especially something that requires a large investment, buyers can be understandably skeptical about adopting a change. That's why we put two Chromebooks with new AMD A4-9120C processors to the test—to see whether the HP Chromebook 11A and Acer Chromebook Spin 311 could handle 12 popular apps students use day in and day out. We found out that the two AMD A4-9120C processor-powered Chromebooks we tested provided an experience similar to their counterparts with Intel Celeron N3350 processors (HP Chromebook 11A and Acer Chromebook Spin 11), and in some cases did even better.

What we tested

Which apps do teachers and students use in the classroom? Depending on the subject, the answer is endless. So we took representative apps from a number of categories that Google uses in the Google Web App Store, selecting popular tools from the following categories:

- G Suite for Education (Google Docs™, Google Sheets™, Google Slides™, Google Drive™)
- Content creation (Magisto Video Editor, Soundtrap for Education, Screencastify Video Editor, Explain Everything)
- STEAM [Science, technology, engineering, arts, and mathematics] (Tinkercad)
- Literacy & numeracy (EquatIO, Scribe EDU)
- Communication & understanding (Seesaw)

We timed how long it took the systems to open the 12 apps we chose and to complete common tasks in them. We used two AMD A4-9120C processor-powered Chromebooks—the HP Chromebook 11A and Acer Chromebook Spin 311—and compared them to an HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors. Then, we ran several industry-standard benchmarks for further comparison. To learn more about how we tested, see the [science behind the report](#).



Real-world application comparison

Here, we present a selection of our findings in each category. We feature many application tasks that took a longer amount of time, because it makes it easier to see the difference when hand timing. For results for all the apps we tested, see the [science behind the report](#).

G Suite for Education

G Suite for Education provides administration, productivity, and collaboration tools for over 80 million users in classrooms worldwide.² We completed several G Suite tasks, including loading a large document in Google Docs, print previewing a large document in Google Sheets, exporting slides in Google Slides, and copying a file in Google Drive to test a range of functions. To learn more about G Suite, visit <https://edu.google.com/products/gsuite-for-education/>.

Easy use of G Suite is important in the classroom, and we found that both the AMD A4-9120C processor-powered HP Chromebook 11A and Acer Chromebook Spin 311 handled large documents faster than the HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors, saving up to 23 seconds when loading a large document in Google Docs. For other tasks, including exporting slides in Google Slides and copying a file to Google Drive, we found that the systems provided a comparable experience.

Google Docs (load large doc)

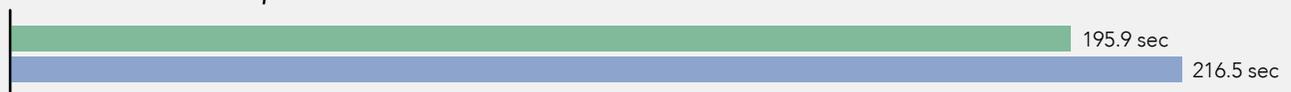
All times are reported in seconds. Less time is better.



HP Chromebook 11A devices



11" Acer Chromebook Spin devices

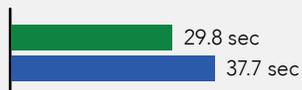


Google Sheets (print preview a large doc)

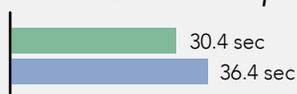
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HP Chromebook 11A devices



11" Acer Chromebook Spin devices



Google Slides (export slides)

All times are reported in seconds. Less time is better.

- AMD A4-9120C processor-powered Chromebooks
- Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices



*Times vary from task to task, so we first show results on the same scale and then magnify them to better show the time differences between the devices.

Google Drive (copy a file)

All times are reported in seconds. Less time is better.

- AMD A4-9120C processor-powered Chromebooks
- Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices



What we mean when we say "comparable"

For the purposes of this report, we consider comparable experience to be within one second of completing the same task. We measured the time each task took using hand timing, and because many tasks took just seconds, we cannot guarantee that every time measurement is perfectly accurate down to the tenth of a second. Example: If System A completes a task in 2.8 seconds, while System B completes the same task in 2.6 seconds, System B is 10 percent faster—but that constitutes a difference of only a fifth of a second, so users would likely experience the task similarly on System A and System B.

Content creation

Magisto (render a 720p video)

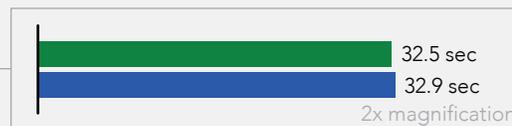
Magisto is an online video editor that allows students to create movies from clips and photos. Learn more at www.magisto.com.

We used Magisto to render a 720p video and found that the AMD A4-9120C processor-based HP Chromebook 11A and Acer Chromebook Spin 311 rendered video just as quickly as the HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors, coming in less than one second apart.

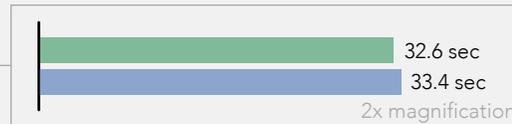
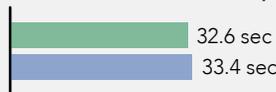
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■ AMD A4-9120C processor-powered Chromebooks
■ Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices



Soundtrap (merge tracks)

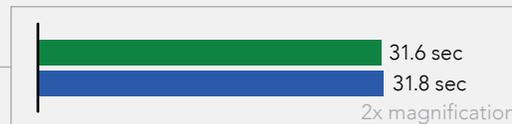
Soundtrap is a popular education app that lets students record and collaborate on music, podcasts, and other sound recordings. Learn more: <https://www.soundtrap.com/edu/>.

When we merged tracks on a Dubstep demo using Soundtrap, the Acer Chromebook Spin 311 with the A4-9120C processor shaved 1.7 seconds off the task compared to the Acer Chromebook Spin 11 with Intel Celeron N3350 processor, and the two HP Chromebook 11A devices completed the tasks within tenths of a second of one another.

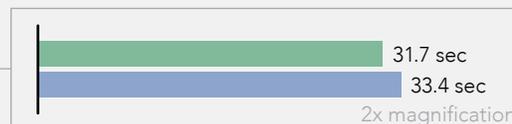
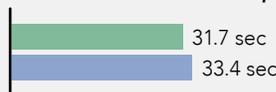
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■ AMD A4-9120C processor-powered Chromebooks
■ Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices



STEAM tool

Tinkercad is a free tool that lets students create and design in 3D. To learn more about Tinkercad, visit <https://www.tinkercad.com/>.

Using Tinkercad, we opened both medium and large models (the hot rod and dragon, respectively) and found that the HP Chromebook 11A and Acer Chromebook Spin 311 with AMD A4-9120C processors and the HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors provided a similar experience for both tasks.

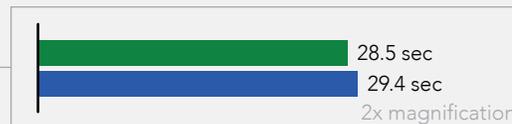


Tinkercad (open large model, dragon)

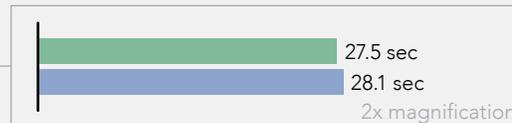
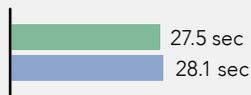
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■ AMD A4-9120C processor-powered Chromebooks
■ Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices

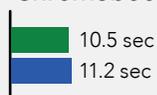


Tinkercad (open medium model, hot rod)

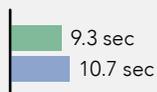
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■ AMD A4-9120C processor-powered Chromebooks
■ Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices



Literacy & numeracy

EquatIO is an extension that allows students to insert functions into G Suite documents to further their math learning. Learn more at <https://www.texthelp.com/en-us/products/equatio/>.

Again, the HP Chromebook 11A and Acer Chromebook Spin 311 with AMD A4-9120C processors and the HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors performed similarly, with only a tenth of a second separation when we inserted a LaTeX math function.

All times are reported in seconds. Less time is better.

■ AMD A4-9120C processor-powered Chromebooks
■ Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices



Communication & understanding

Seesaw (open and share activity)

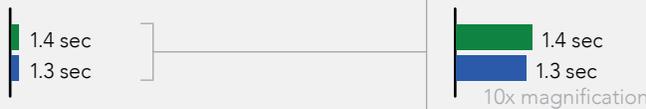
Seesaw allows teachers to create activities to share with students, who capture their work in a portfolio, which parents can also view. To learn more, visit <https://web.seesaw.me/>.

When we opened and shared an activity in Seesaw, the HP Chromebook 11A and Acer Chromebook Spin 311 devices with AMD A4-9120C processors and the HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors once again took a similar amount of time to complete the tasks, with differences of only a tenth of a second.

All times are reported in seconds. Less time is better.

■ AMD A4-9120C processor-powered Chromebooks
■ Intel Celeron N3350 processor-powered Chromebooks

HP Chromebook 11A devices



11" Acer Chromebook Spin devices



Comparing performance with benchmarks

Industry-standard benchmarks assess devices based on how well each device performs a given task or set of tasks. We chose benchmarks that target the processor, and found that as in the real-world app comparison, both the HP Chromebook 11A and the Acer Chromebook Spin 311 with AMD A4-9120C processors and HP Chromebook 11A and Acer Chromebook Spin 11 with Intel Celeron N3350 processors performed similarly across all the tests, with both AMD A4-9120C processor-powered systems we tested scoring slightly higher. The biggest difference was on the Speedometer benchmark, which saw a 23 percent improvement for the HP Chromebook 11A with AMD A4-9120C processor vs. the HP Chromebook 11A with Intel Celeron N3350 processor. For the full results of our benchmark tests, see the [science behind the report](#).

THE BENCHMARKS

CrXPRT – A performance and battery life benchmark application for Chrome OS devices. It measures a Chromebook’s speed using HTML5- and JavaScript-based workloads designed to simulate everyday tasks.

JetStream2 – A JavaScript and WebAssembly benchmark suite that runs several subtests and combines the results into a single score. Higher scores mean the browser starts up and executes code quickly and runs smoothly.

Mozilla Kraken – Uses multiple test cases from real-world apps to measure JavaScript performance.

Speedometer 2.0 – A browser responsiveness benchmark that uses demo web applications to simulate user actions.

WebXPRT 3 – A benchmark that shows how well a system handles web-based tasks, such as photo editing and online homework, that real-world users do every day. It includes two AI-based workloads to reflect new kinds of tasks users do on their devices.

	HP Chromebook 11A		11" Acer Chromebooks	
	with AMD A4-9120C processor	with Intel Celeron N3350 processor	with AMD A4-9120C processor	with Intel Celeron N3350 processor
CrXPRT				
Download CrXPRT app score	111.00	104.00	113.00	104.00
JetStream 2				
JetStream 2 web page score	38.09	36.71	39.19	36.52
Mozilla Kraken				
Mozilla Kraken web page (ms) <i>[lower is better]</i>	2916.30	2988.60	2924.80	2991.10
Speedometer 2.0				
Speedometer 2.0 web page score	31.70	25.71	32.48	25.70
WebXPRT				
Preview multiple files score	79.00	67.00	80.00	68.00

*Bold scores are better.



Comparing pricing

Though bulk purchases are likely to come with discounts, we compare the prices of the systems we tested below as priced from CDW.com on May 10, 2019 with no discounts, tax, or other fees.

Because the systems we tested provided a comparable experience with processors from the two vendors, the right choice for your school may come down to which helps you stretch and preserve your budget.

	HP Chromebook 11A		11" Acer Chromebooks	
	with AMD A4-9120C processor	with Intel Celeron N3350 processor	with AMD A4-9120C processor	with Intel Celeron N3350 processor
Systems	HP 11" Chromebook 11A with A4-9120C	HP 11" Chromebook 11A with Intel Celeron N3350	Acer Chromebook Spin 311 R721T 11.6" AMD A4-9120C	Acer Chromebook Spin 11 R751T-C4XP - 11.6" - with Intel Celeron N3350
Retail cost	\$244	\$269	\$352.99	\$352.99

More choices in Chromebooks create options for your school

With AMD entering the Chromebook market with the HP Chromebook 11A and the Acer Chromebook Spin 311, school districts have more options than ever when making an investment in these educational tools. As our hands-on experience with 12 educational apps showed, the AMD A4-9120C processor-powered Chromebooks from HP and Acer that we tested provided a comparable experience to the Intel Celeron N3350 processor-based HP Chromebook 11A and Acer Chromebook Spin 11—and handled multiple large document tasks slightly better, which could save students time in the classroom when they’re getting to work.

Industry-standard benchmarks confirmed the general performance similarity between the systems, which means that your students could expect a comparable experience on these tasks from the HP Chromebook 11A with either the AMD A4-9120C or Intel Celeron N3350 processor and the Acer Chromebook Spin 311 with AMD A4-9120C processor or Acer Chromebook Spin 11 with Intel Celeron N3350 processor. That leaves more room for you to consider budget, availability, and other factors when it comes to your new Chromebook purchase. For the 12 apps we tested, the new HP Chromebook 11A and Acer Chromebook Spin 311 with AMD A4-9120C processors can provide strong performance your students can rely on.

- 1 Cyrus Mistry, "All types of Chromebooks for all types of learners," accessed May 14, 2019, <https://blog.google/outreach-initiatives/education/all-types-chromebooks-all-types-learners/>.
- 2 Cyrus Mistry, "All types of Chromebooks for all types of learners."

Read the science behind this report at <http://facts.pt/aj0n62k> ▶



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This project was commissioned by AMD.