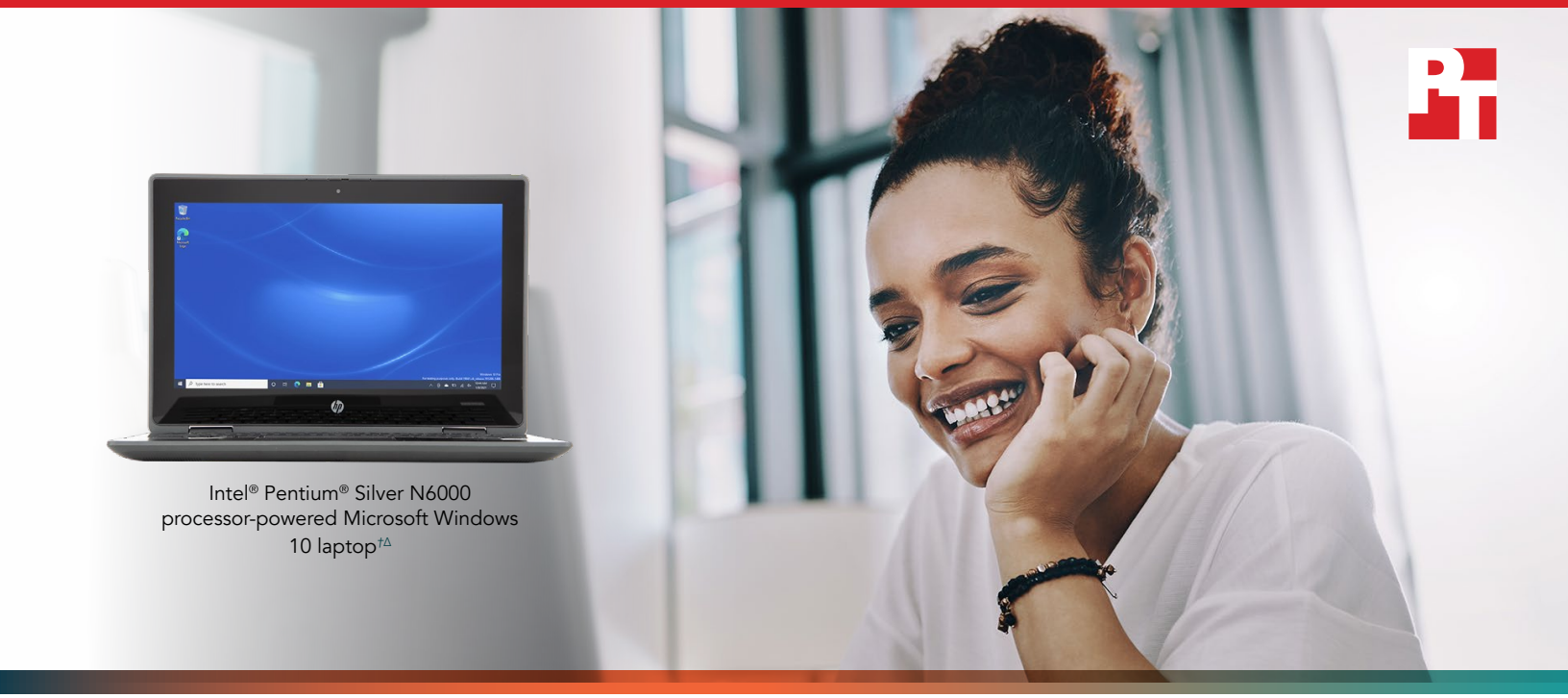


Intel® Pentium® Silver N6000 processor-powered Microsoft Windows 10 laptop†Δ

Get a more responsive Windows laptop and help students tinker and create

An Intel Pentium Silver N6000 processor-powered Windows 10 laptop completed tasks in educational apps in less time than a laptop powered by an AMD A9-9245 processor

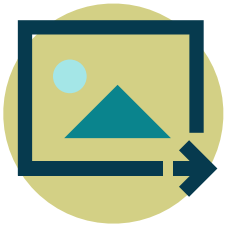
At Principled Technologies, we compared the time required to complete tasks in a variety of educational apps when using the following Windows 10 laptops:

- An Intel Pentium Silver N6000 processor-powered laptop
- An AMD A9-9245 processor-powered Dell™ Inspiron™ 3595

The apps we tested include Microsoft Teams, Autodesk® Tinkercad®, and Minecraft. In each test, the Intel Pentium Silver N6000 processor-powered laptop completed the tasks in less time than the AMD A9-9245 processor-powered laptop. In addition, the Intel Pentium Silver N6000 processor-powered laptop achieved a higher score in a web-app responsiveness benchmark test called Speedometer 2.0.

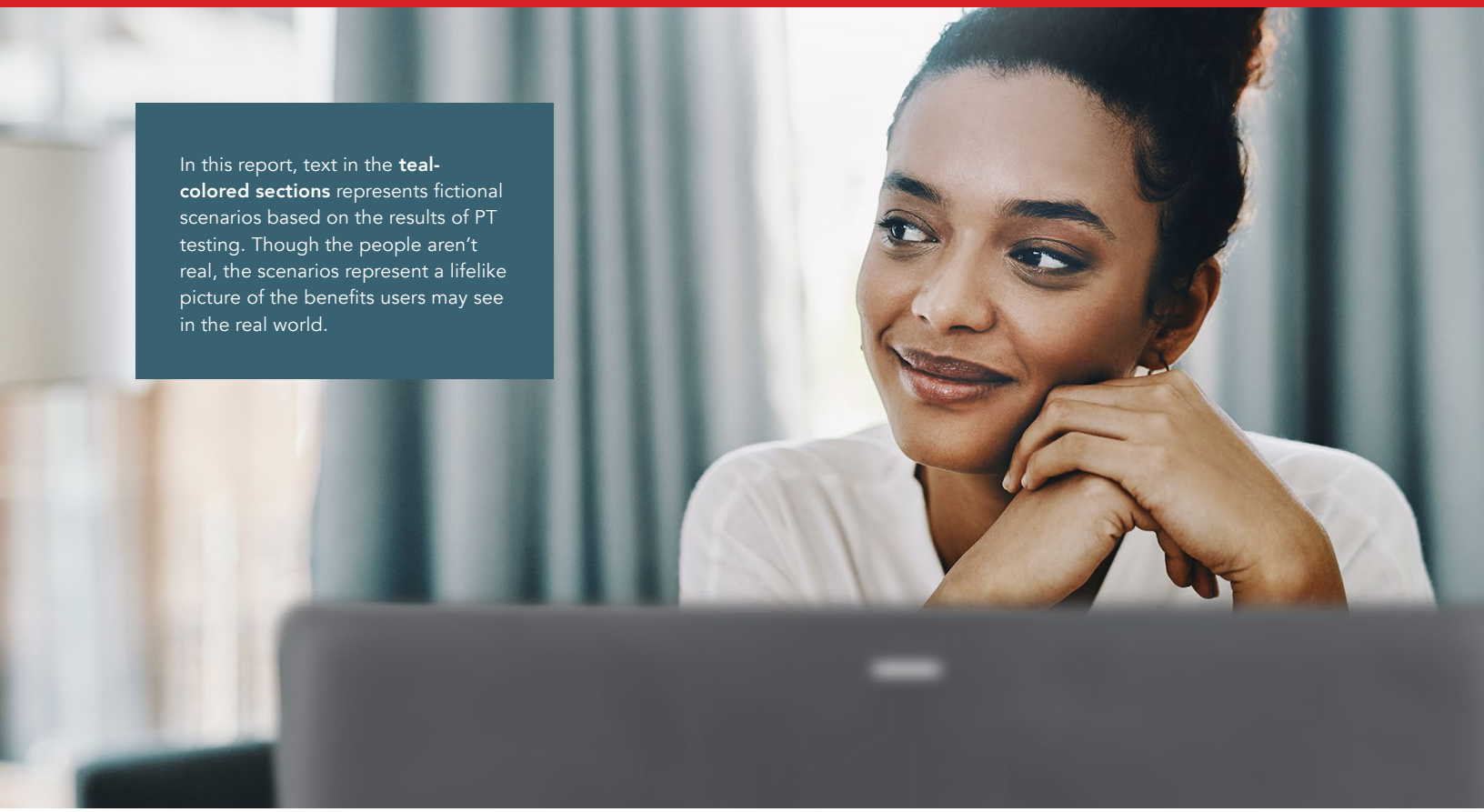
27%
less time
to open a presentation while video conferencing†Δ

26%
less time
to launch a video game†Δ



23%
less time
to batch-edit 140 photos†Δ

†HP ProBook x360 11 G7 (pre-production unit) with an Intel Pentium Silver N6000 processor compared to a Dell Inspiron 3595 with an AMD A9-9425 processor
ΔSee **the science behind this report** for detailed system configurations and benchmark results.



In this report, text in the **teal-colored sections** represents fictional scenarios based on the results of PT testing. Though the people aren't real, the scenarios represent a lifelike picture of the benefits users may see in the real world.

How we tested

We tested each laptop by hand-timing common tasks in a variety of classroom and creativity apps. To reflect a real-world scenario where students and teachers need to perform tasks in the middle of a virtual class session, we performed tasks in Microsoft Teams and Microsoft PowerPoint Online while each laptop was connected to a two-way video call via Microsoft Teams Meeting. We performed the rest of testing without a video call to reflect students working on assignments outside of class.

[Δ]See **the science behind this report** for detailed system configurations and benchmark results.

Note: Each of the graphs in this report uses a different x axis in order to keep to a consistent size. Please be mindful of each graph's data range as you compare.

Ms. Kay's classroom recently switched from AMD A9-9245 processor-powered Windows laptops to laptops powered by the new Intel Pentium Silver N6000 processor.

The students find the new laptops to be much snappier than their old ones, and Ms. Kay agrees. Now, it takes much less time for her to open up the day's lesson in Microsoft Teams, and even to edit presentations on-the-fly during class.

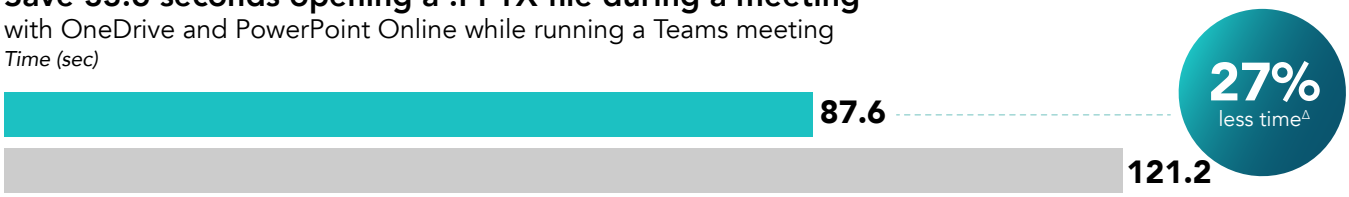
Save time completing tasks while class is in session

We assessed the multitasking capabilities of each device by measuring the time required to complete tasks in Microsoft Teams OneDrive and Microsoft PowerPoint Online while each device was connected to a Microsoft Teams Meeting call. Notably, the Intel Pentium Silver N6000 processor-powered laptop saved 33.6 seconds opening a .PPTX file from Teams OneDrive compared to the AMD A9-9245 processor-powered laptop.

Save 33.6 seconds opening a .PPTX file during a meeting

with OneDrive and PowerPoint Online while running a Teams meeting

Time (sec)



Save 1.7 seconds changing slides

with PowerPoint Online and Edge while running a Teams meeting

Time (sec)

Save 1.6 seconds copying/pasting a table

with PowerPoint Online and Edge while running a Teams meeting

Time (sec)

HP ProBook x360 11 G7 with an Intel Pentium Silver N6000 processor (pre-production unit)
Dell Inspiron 3595 with an AMD A9-9425 processor

Figure 1: Time (in seconds) to complete tasks in Microsoft Teams OneDrive and Microsoft PowerPoint Online while each device was connected to a Microsoft Teams Meeting call. Less time is better. Source: Principled Technologies.

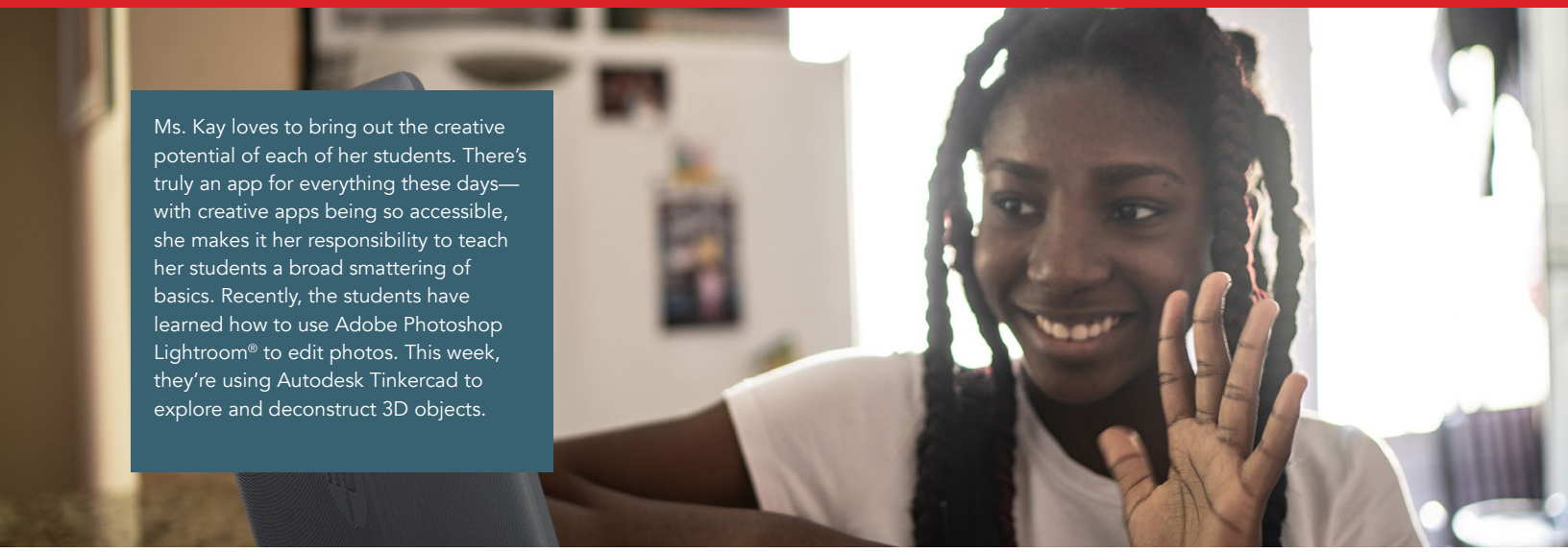
Microsoft Teams

Teams is a platform for online conferencing and collaboration. It contains features such as Together Mode, which puts all classroom participants on a shared background, and integrates with more than 700 popular apps.[1,2]

Microsoft OneDrive

OneDrive is online storage that enables users to access and edit files across devices, back up precious data to the cloud, and share and collaborate on documents in real time via Microsoft Online apps (such as PowerPoint Online).[3]

△See **the science behind this report** for detailed system configurations and benchmark results.



Ms. Kay loves to bring out the creative potential of each of her students. There's truly an app for everything these days—with creative apps being so accessible, she makes it her responsibility to teach her students a broad smattering of basics. Recently, the students have learned how to use Adobe Photoshop Lightroom® to edit photos. This week, they're using Autodesk Tinkercad to explore and deconstruct 3D objects.

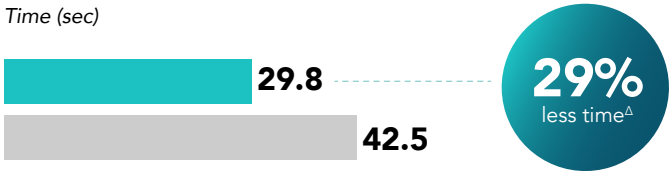
Save time editing photos and 3D-modeled assets

In our photo-editing tests with Adobe Photoshop Lightroom, the Intel Pentium Silver N6000 processor-powered laptop saved 23.2 seconds batch-processing a set of 140 photos using a preset filter compared to the AMD A9-9245 processor-powered laptop. In our 3D modeling tests with Autodesk Tinkercad, the Intel Pentium Silver N6000 processor-powered laptop saved 12.7 seconds using the Copy and Tinker function on a 3D asset.

Save 23.2 seconds batch-processing 140 photos
with Lightroom
Time (sec)

Figure 2: Time (in seconds) to edit photos in Adobe Lightroom. Less time is better. Source: Principled Technologies.

Save 12.7 seconds using the Copy and Tinker function
with Tinkercad
Time (sec)



Save 4.8 seconds rendering the 3D Rally Car asset
with Tinkercad
Time (sec)

HP ProBook x360 11 G7 with an Intel Pentium Silver N6000 processor (pre-production unit)
Dell Inspiron 3595 with an AMD A9-9425 processor

Figure 3: Time (in seconds) to complete tasks in Autodesk Tinkercad. Less time is better. Source: Principled Technologies.

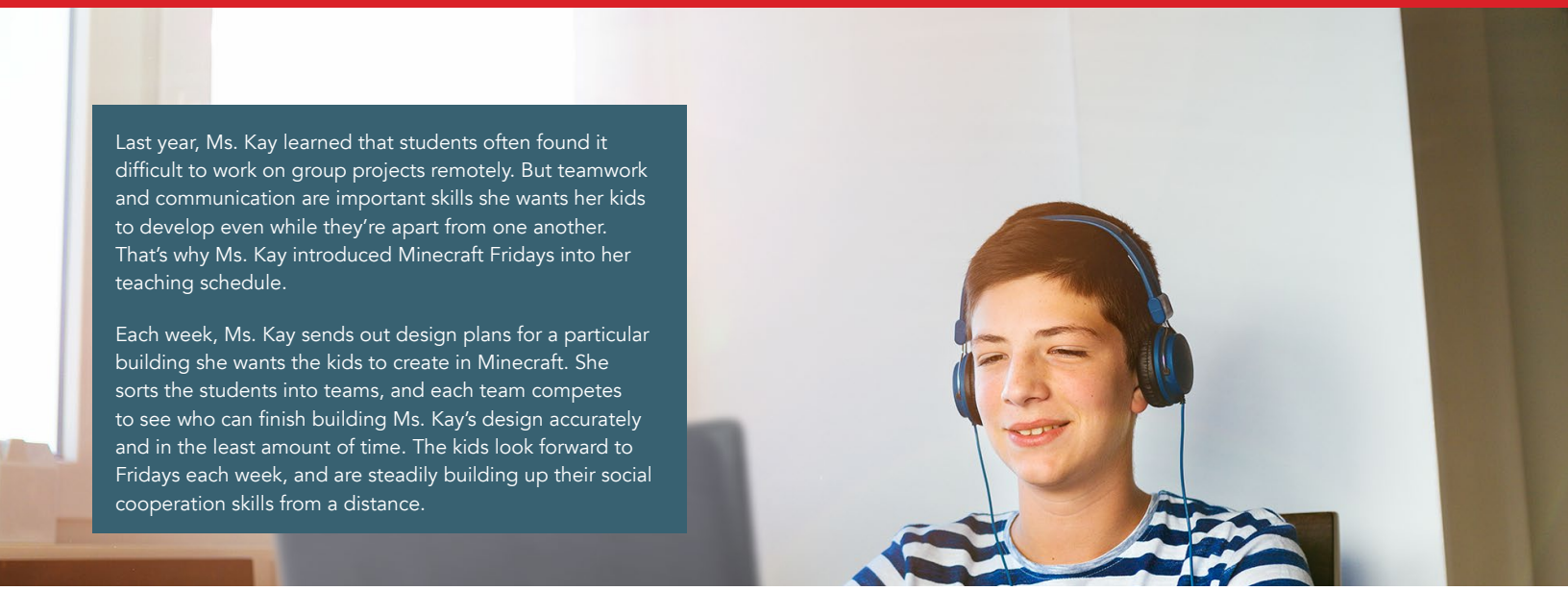
Adobe Photoshop Lightroom

Lightroom is a cloud-based photo editing app that enables you to edit, organize, and manage photos across your devices, and to share your next big photography project with collaborators.[4]

Autodesk Tinkercad

Tinkercad is a browser-based program for computer-aided design.[5] Common Sense Education® gave Tinkercad a 4 out of 5 star rating, citing the app's pedagogical utility.[6]

△See **the science behind this report** for detailed system configurations and benchmark results.



Last year, Ms. Kay learned that students often found it difficult to work on group projects remotely. But teamwork and communication are important skills she wants her kids to develop even while they're apart from one another. That's why Ms. Kay introduced Minecraft Fridays into her teaching schedule.

Each week, Ms. Kay sends out design plans for a particular building she wants the kids to create in Minecraft. She sorts the students into teams, and each team competes to see who can finish building Ms. Kay's design accurately and in the least amount of time. The kids look forward to Fridays each week, and are steadily building up their social cooperation skills from a distance.

Save time launching educational video games

In our Minecraft tests, compared to the AMD A9-9245 processor-powered laptop, the laptop powered by an Intel Pentium Silver N6000 processor saved 6.6 seconds launching a trial of the game from Microsoft Store, and 6.2 seconds launching a demo of the game's Java edition from Minecraft Launcher.

Save 6.6 seconds launching the Minecraft for Windows 10 game trial
with Minecraft, Microsoft Store
Time (sec)

Figure 4: Time (in seconds) to launch Minecraft from Microsoft Store. Less time is better. Source: Principled Technologies.

Save 6.2 seconds launching the Minecraft Java Edition game
with Minecraft
Time (sec)

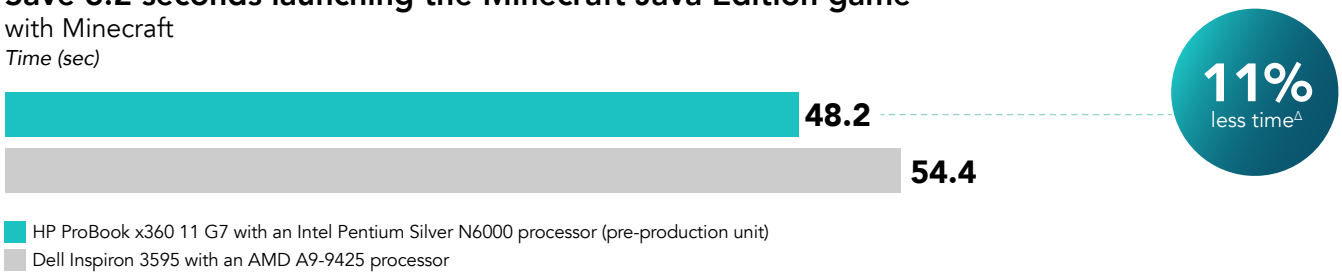


Figure 5: Time (in seconds) to launch Minecraft Java Edition from Minecraft Launcher. Less time is better. Source: Principled Technologies.

Minecraft

The best-selling video game of all time isn't just for having fun outside of school.[7] Minecraft has an education edition that features classroom management tools and pre-made lesson plans on everything from code to history to social-emotional learning (SEL).[8]

[Δ]See **the science behind this report** for detailed system configurations and benchmark results.

Better responsiveness in the Speedometer 2.0 benchmark test

In addition to the hand-timed tasks, we tested each laptop with the Speedometer 2.0 web responsiveness benchmark. Speedometer 2.0 assesses the responsiveness of web apps by simulating user actions and measuring the time required to complete those actions. The Intel Pentium Silver N6000 processor-powered laptop we tested achieved a 36 percent better Speedometer 2.0 score compared to the AMD A9-9245 processor-powered laptop, suggesting that the laptop with the Intel processor would be better equipped to handle web-based applications.

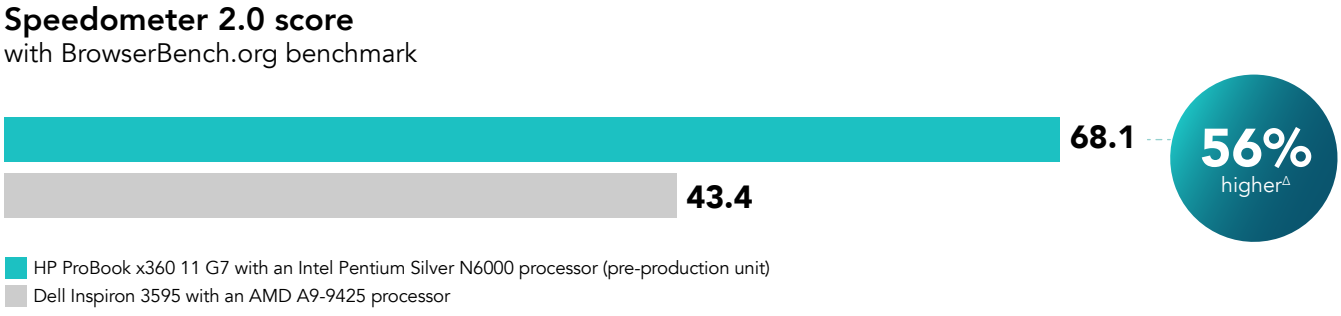


Figure 6: Speedometer 2.0 benchmark results. A higher score is better. Source: Principled Technologies.

Conclusion

If your classroom is virtual, the more responsive your laptops are, the better the classroom experience will be. In our hands-on tests, a Windows 10 laptop PC powered by an Intel Pentium Silver N6000 processor enabled us to complete common tasks in a variety of educational apps in less time than a laptop powered by an AMD A9-9245 processor, including tasks we performed while multitasking during a two-way Microsoft Teams video call. The Intel Pentium Silver N6000 processor-powered laptop also showed stronger performance during the Speedometer 2.0 benchmark for web-app responsiveness.

To learn more, visit https://intel.com/content/www/us/en/windows/windows-10.html.

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1 "Chat, Meetings, Calling, Collaboration | Microsoft Teams," accessed January 13, 2021, https://www.microsoft.com/en-us/microsoft-teams/group-chat-software.

2 "Apps and Workflow Automation | Microsoft Teams," accessed January 13, 2021, https://www.microsoft.com/en-us/microsoft-teams/apps-and-workflows.

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4 "Photo editing and organizing software | Adobe Photoshop Lightroom," accessed January 13, 2021, https://www.adobe.com/products/photoshop-lightroom.html.

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6 Marianne Rogowski, "Tinkercad Review for Teachers," accessed January 13, 2021, https://www.commonsense.org/education/website/tinkercad.

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8 "Homepage | Minecraft Education Edition," accessed January 13, 2021, https://education.minecraft.net/

Read the science behind this report at http://facts.pt/tRMeRRw ▶

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This project was commissioned by Intel.