



The science behind the report:

Get a more responsive Chromebook for your virtual classroom

This document describes what we tested, how we tested, and what we found. To learn how these facts translate into real-world benefits, read the report [Get a more responsive Chromebook for your virtual classroom](#).

We concluded our hands-on testing on December 23, 2020. During testing, we determined the appropriate hardware and software configurations and applied updates as they became available. The results in this report reflect configurations that we finalized on December 21, 2020 or earlier. Unavoidably, these configurations may not represent the latest versions available when this report appears.

Our results

To learn more about how we have calculated the wins in this report, go to <http://facts.pt/calculating-and-highlighting-wins>. Unless we state otherwise, we have followed the rules and principles we outline in that document.

Table 1: Results of hand-timed tasks for each Chromebook. Time is in seconds. Less time is better. Each result represents the median of three test runs.

Task	HP Chromebook 11 G9 EE with Intel Pentium Silver N6000 processor (pre-production unit)	Acer Chromebook Spin 311 CP311-3H-K23X with MediaTek MT8183 processor	Intel processor-powered Chromebook percentage less time
Opening a Google Slides™ presentation from Google Drive™ during a Google Meet call	24.7	55.1	55%
Changing slides in Google Slides during a Google Meet call	2.1	3.7	43%
Copying and pasting a table in Google Slides during a Google Meet call	3.2	5.1	37%
Importing 140 photos into Adobe Lightroom®	87.3	216.6	59%
Batch-processing 140 photos with a filter preset in Adobe Lightroom	42.5	80.2	47%
Exporting 140 photos from Adobe Lightroom	83.7	201.6	58%
Using the Copy and Tinker function for the Rally Car project in Autodesk® Tinkercad®	27.3	40.8	33%

Table 2: Results of the Speedometer 2.0 benchmarking test for each Chromebook. A higher score is better. Each result represents the median of three test runs.

	HP Chromebook 11 G9 EE with Intel Pentium Silver N6000 processor (pre-production unit)	Acer Chromebook Spin 311 CP311-3H-K23X with MediaTek MT8183 processor	Intel processor-powered Chromebook percent higher score
Speedometer 2.0 score	81.1	27.7	192%

System configuration information

Table 3: Detailed information on the systems we tested.

System	HP Chromebook 11 G9 EE (pre-production unit)	Acer Chromebook Spin 311 CP311-3H-K23X
Processor	Intel Pentium Silver N6000	MediaTek MT8183
Processor frequency (GHz)	1.10	1.6
Processor cores	4	8
Memory (GB)	4	4
Storage (GB)	64	32
USB	2 x USB 3.1 Type-C 2 x USB 3.1 Gen 1	1 x USB 3.1 Type-C 1 x USB 3.1 Gen 1
Battery type	Lithium ion	Lithium ion
Battery capacity (Wh)	48	38
Display (in.)	11.6	11.6
Display resolution	1366 x 768	1366 x 768
OS (version)	87.0.4280.51	87.0.4280.109
System weight (lbs.)	3.19	2.62

How we tested

Application testing

For each scenario, we downloaded, installed, and pinned the requisite apps to the Chrome shelf. For applications that required accounts, we created test profiles and logged in the users on each device. We conducted three test runs for each task. We reset the Chromebook between each run.

Testing tasks in Adobe Lightroom

Importing 140 photos

1. From the Adobe Lightroom home page, click the blue Import Photos icon.
2. Sort by Device Folders, and select the unarchived test photos by clicking the checkbox next to the folder name.
3. Simultaneously start the timer and click Add.
4. When the import dialog completes, stop the timer.

Batch-processing 140 photos with filter preset

1. From the Adobe Lightroom home page, click the collection containing the test photos.
2. Click the first image.
3. Click the Adjustments icon.
4. To apply auto-adjustments, click Auto.
5. In the top right, click the menu button, and select Copy Settings.
6. Leave the default settings, and click OK.
7. To return to the collection view, click the back arrow.
8. To select the first photo, long-click it.
9. In the top right, click the menu button, and select Select All.
10. Click the menu button again, and select Paste Settings.
11. Simultaneously start the timer and click Apply.
12. When the processing dialog closes, and the phrase “Changes applied to 140 photos” appears, stop the timer.

Exporting 140 photos

1. From the Adobe Lightroom home page, click the collection containing the test photos.
2. To select the first image, click it.
3. From the drop-down menu, click Select All images.
4. With all images selected, click the Share icon.
5. From the Share dialog box, click Export As...
6. Leave the default settings.
7. Simultaneously start the timer and click the checkmark icon.
8. When the export dialog completes, stop the timer.

Testing in Autodesk Tinkercad

Using the Copy and Tinker function on the 3D Rally Car project

1. From the Chrome web browser, navigate to the test project at <https://tinkercad.com/things/4x4r4zQv1bL>.
2. Simultaneously start the timer and click Copy and Tinker.
3. When the 3D model has fully loaded, stop the timer.

Multitasking with Google Meet

To conduct our multitasking testing, we opened Google Meet in the Chrome web browser and joined a two-participant video meeting.

Joining the meeting

1. Open the Chrome web browser.
2. Open a new tab, and enter the meeting URL.
3. Click to join the meeting.
4. Ensure video is connected. For our testing, to ensure the video content was roughly the same across devices, we pointed each Chromebook's camera at a blank ceiling.
5. From the meeting host, share and begin playback of the following YouTube video: <https://www.youtube.com/watch?v=4VQYiksNQFQ>.
6. Open a new tab, and complete the tasks below.

Opening a Google Slides presentation from Google Drive

1. Navigate to <https://drive.google.com>.
2. Locate the test presentation file. Right-click the file, and hover the cursor over Open With.
3. Simultaneously start the timer and click Google Slides.
4. When the presentation fully loads in Google Slides, stop the timer.

Changing a slide in the Google Slides presentation

1. With the test presentation open, simultaneously start the timer and click the second slide.
2. When the second slide has fully loaded into the current slide preview, stop the timer.

Copying and pasting a table in Google Slides

1. With the test presentation open, click a table column to select it.
2. Copy the table column.
3. Click the blank slide.
4. Simultaneously start the timer and paste the table.
5. When the copied content fully loads, stop the timer.

Testing with Speedometer 2.0

Running the Speedometer 2.0 benchmark test

1. From the Chrome web browser, navigate to <https://browserbench.org/Speedometer2.0/>.
2. Ensure the browser window fits the required view port size.
3. Click Start Test.
4. When the test completes, record the results.

Intel contributes to the development of benchmarks by participating in, sponsoring, and/or contributing technical support to various benchmarking groups, including the BenchmarkXPRT Development Community administered by Principled Technologies.

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