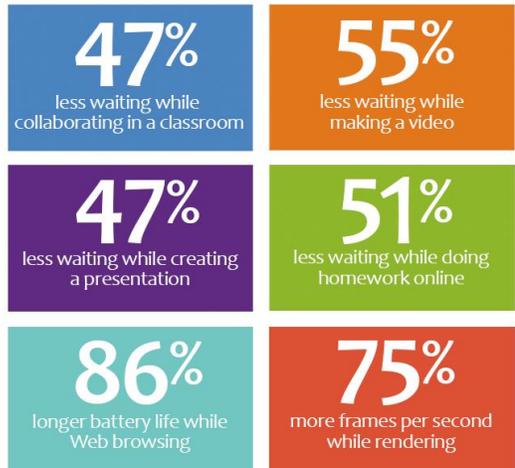


Less waiting, more learning

The Dell™ Chromebook™ 11 powered by Intel moved through every scenario with less waiting than the ARM processor-based HP Chromebook 11, and had longer battery life while browsing.



Today's students are growing up with technology in the classroom and at home. They want to pick up their devices, get going right away, and move quickly from one thing to another. If they need to wait too long for something to load or have to worry about low battery life, they can get distracted or frustrated. Teachers also want students to have responsive devices with long battery life so they can start teaching sooner and have an easier time getting and keeping their students engaged.

Which Chromebook model is best for students and teachers? We put two Chromebooks through student scenarios that included tasks such as starting a presentation and creating a video. We also looked at how long the two Chromebooks could keep running on a single charge and how many frames per second they could deliver while rendering an anatomy simulation.

We found that only the Intel® processor-powered Dell Chromebook 11 aced the test, moving through four student scenarios with up to 55 percent less waiting than the ARM processor-based HP Chromebook 11. The Intel processor-powered Dell Chromebook 11 also lasted 86 percent longer on a single charge and rendered the anatomy simulation with 75 percent more frames per second. With the Intel processor-powered Dell Chromebook 11, students can spend less time waiting and more time learning.



LESS WAITING AND MORE LEARNING WITH THE RIGHT CHROMEBOOK

The right Chromebook can facilitate learning instead of getting in the way of it. We looked at the Intel processor-powered Dell Chromebook 11 and the ARM processor-based HP Chromebook 11, putting them through a series of tasks that real students would perform regularly. We also looked at how long each Chromebook could keep going on a single charge while lightly browsing the Internet, and how many frames per second each Chromebook could deliver while rendering an anatomy simulation. For more on how we tested, see [Appendix B](#). For detailed results, see [Appendix C](#).

We chose two systems that were as comparable as possible; these systems shared the same display size and the same amount of memory and storage. In addition to the processor, they differed in battery capacity—51 Wh for the Intel processor-powered Dell Chromebook 11 and 30 Wh for the ARM processor-based HP Chromebook 11. For more on the representative systems, see [Appendix A](#).

BATTERY LIFE WHILE BROWSING

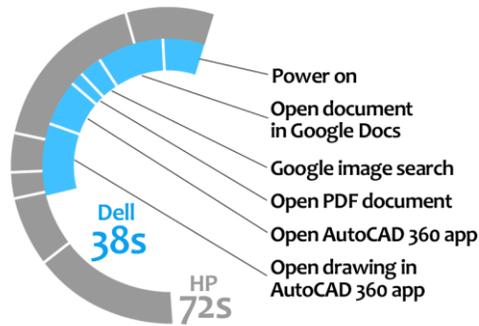
Battery life is important—who wants to worry about outlets and charging stations? We found that the Intel processor-powered Dell Chromebook 11 lasted 86 percent longer than the ARM processor-based HP Chromebook 11 while lightly browsing the Internet—an additional 5 hours and 16 minutes without a charge (see Figure 1).



Figure 1: The amount of the time the two Chromebooks lasted on a single charge while lightly browsing the Internet.

COLLABORATING IN A CLASSROOM

Gabriel’s teacher breaks the class into groups, each of which will work together to design a birdhouse. Gabriel powers on his Chromebook and gets to work with his team. He opens the assignment’s instructions in Google® Docs and uses Google Search to find pictures of birdhouses his team can use for reference. Before they start laying out the design, Gabriel opens a PDF document to read about design considerations for wooden birdhouses. Once the team has agreed on a plan, Gabriel launches the Autodesk® AutoCAD® 360 app and opens his project’s template. Then he adds his classmates as collaborators in the AutoCAD 360 app so they can all work together on the project using their own Chromebooks.



47%
less waiting while collaborating in a classroom

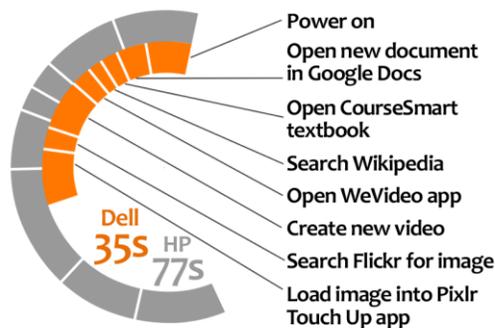
Figure 2: The amount of time spent waiting when using the two Chromebooks to collaborate in a classroom.

Gabriel would save over 11 seconds when opening the instructions for the assignment on the Intel processor-powered Dell Chromebook 11.

As Figure 2 shows, the Intel processor-powered Dell Chromebook 11 moved through the tasks with 47 percent less waiting than the ARM processor-based HP Chromebook 11. This means that if Gabriel were using the Intel processor-powered Dell Chromebook 11, he would spend only about half as much time waiting. Instead of waiting over 11 extra seconds to open the assignment’s instructions, he could be working with his classmates on the birdhouse design. Gabriel wouldn’t want to wait 10 seconds longer for the template in the AutoCAD 360 app to open on the ARM processor-based HP Chromebook 11.

MAKING A VIDEO

In history class, Olivia turns on her Chromebook to start working on a video presentation about the Revolutionary War. She opens a new document in Google Docs to take notes and create an outline for the presentation. She opens her CourseSmart® textbook and, after reading for a while, searches Wikipedia® to look for information on the Boston Tea Party. When she finishes her outline, Olivia opens the WeVideo app and creates a new video project. She uses Flickr to find a good opening image and edits it in the Pixlr® Touch Up app.



55%
less waiting while making a video

Figure 3: The amount of time spent waiting when using the two Chromebooks to make a video.

Olivia would have to wait three times as long when opening the WeVideo app on the ARM processor-based HP Chromebook 11.

As Figure 3 shows, the Intel processor-powered Dell Chromebook 11 moved through the tasks with 55 percent less waiting than the ARM processor-based HP Chromebook 11. After finishing her outline, Olivia would have to wait three times as long for the WeVideo app to open on the ARM processor-based HP Chromebook 11. While working on the video, Olivia would save precious time at each step on the Intel processor-powered Dell Chromebook 11—7 seconds when creating a new video in the WeVideo app, 7 seconds when searching for images on Flickr, and 9 seconds when loading an image into the Pixlr Touch Up app.

CREATING A PRESENTATION

For English class, Elizabeth and a classmate are preparing a presentation on the use of metaphor in *Romeo and Juliet*. She turns on her Chromebook and searches for the TED-Ed video on Shakespearean Dating Tips. While watching the video, she opens Google Keep™ and takes a few notes. She then opens a new presentation in Google Slides and starts creating slides. When she is working on the metaphor of stars as eyes, she opens the Planetarium app and looks at some constellations. She also opens Google Maps™ and searches for Verona to look at the city through Street View™. When she finishes, Elizabeth calls her classmate in Google Hangouts™ to rehearse for the class presentation.



Figure 4: The amount of time spent waiting when using the two Chromebooks to create a presentation.

Elizabeth would save 13 seconds powering on and getting to a new Google Slides presentation on the Intel processor-powered Dell Chromebook 11.

As Figure 4 shows, the Intel processor-powered Dell Chromebook 11 moved through the tasks with 47 percent less waiting than the ARM processor-based HP Chromebook 11. Instead of waiting 13 extra seconds when powering on the ARM processor-based HP Chromebook 11 and opening Google Keep and a new Google Slides presentation, Elizabeth could actually work on the presentation. After finishing the presentation, she would save 5 seconds starting a new Google Hangouts call to rehearse for the class presentation.

DOING HOMEWORK ONLINE

When Mario gets home from school, he turns on his Chromebook to do his math homework. He opens the GeoGebra app and learns about measuring the lengths of the sides of a triangle. As he does so, he adds notes to a document he's saved in Google Docs. In another tab, Mario opens the Design Something app to work with 3D models of the shapes he's studying. To prepare for a test the next day, he opens the CK-12 trigonometry lesson. Then, Mario takes a break to watch a TED-Ed video his friend sent him.



Figure 5: The amount of time spent waiting when using the two Chromebooks to do homework online.

Mario could get frustrated waiting 8 extra seconds when opening YouTube and playing the TED-Ed video on the ARM processor-based HP Chromebook 11.

As Figure 5 shows, the Intel processor-powered Dell Chromebook 11 moved through the tasks in 51 percent less time than the ARM processor-based HP Chromebook 11. This means that if Mario were using the Intel processor-powered Dell Chromebook 11, he could be doing his math homework instead of waiting almost 12 extra seconds for his notes to open in Google Docs. Mario would have to wait 8 extra seconds when opening YouTube and playing the TED-Ed video on the ARM processor-based HP Chromebook 11.

WEBGL¹ RENDERING IN AN ANATOMY SIMULATION

Immersive 2D and 3D graphics in education apps enhance learning only if they render quickly and smoothly. Some education apps such as BioDigital Human™ now use WebGL™, a new Web standard for 2D and 3D, because WebGL doesn't require users to install a browser plugin. We looked at the BioDigital Human app and found that the Intel processor-powered Dell Chromebook 11 delivered 75 percent more frames per second than the ARM processor-based HP Chromebook 11 while rendering pneumonia (see Figure 6).

¹ WebGL and the WebGL logo are trademarks of the Khronos Group Inc.



Figure 6: The number of frames per second the two Chromebooks delivered while rendering an anatomy simulation.

THE BOTTOM LINE

The longer students must wait for apps or documents to open, the more opportunities there are for distractions such as chatting and doodling, and the longer it takes to get to learning in the classroom or at home. We put two Chromebook models to the test, and found that the Intel processor-powered Dell Chromebook 11 moved through the student scenarios with up to 55 percent less waiting than the ARM processor-based HP Chromebook 11. It also delivered 75 percent more frames per second and lasted 86 percent longer on a single charge while lightly browsing the Internet. The bottom line: With the Intel processor-powered Dell Chromebook 11, students can get to learning sooner, waste less time waiting, and keep learning longer.

APPENDIX A: DETAILED SYSTEM CONFIGURATION

Figure 7 presents detailed information on the two Chromebooks we tested.

System	Intel processor-powered Dell Chromebook 11	ARM processor-based HP Chromebook 11
Vendor and model	Dell Chromebook 11	HP Chromebook 11
Processor	Intel Celeron® Processor 2955U (Haswell microarchitecture)	Samsung® Exynos® 5 Dual
Processor frequency (GHz)	1.4	1.7
Processor cores	2	2
Memory	2GB DDR3L SDRAM	2GB DDR3L SDRAM
Storage	16GB SSD	16GB SSD
Battery type	3 cell Li-Polymer	3 cell Li-Polymer
Battery capacity	51 Wh	30 Wh
Display	11.6" (1,366 × 768)	11.6" (1,366 × 768)
Wireless	802.11 a/b/g/n	802.11 a/b/g/n
Bluetooth®	Bluetooth 4.0 compatible	Bluetooth 3.0 compatible
USB ports	2 × USB 3.0	2 × USB 2.0
System weight	2.9 lbs.	2.3 lbs.
OS	Chrome OS version 33.0.1750.152	Chrome OS version 33.0.1750.152
Firmware	Google_Wolf.4389.24.43	Google_Spring.3824.129.0

Figure 7: Detailed configuration information for the two Chromebooks.

APPENDIX B: DETAILED TEST METHODOLOGY

Battery life while browsing

Setting up the test

1. Make sure the display will not automatically turn off during the test.
 - a. Install the Keep Awake extension.
 - b. To switch to the sun icon, click the icon in the top-right corner of the Chrome™ browser.
2. Open Google Chrome from the shelf, and bookmark the msn.com Web site.
3. Set the displays to as close to 70 nits as possible.
4. Plug the Chromebook chargers into a power strip.
5. Make sure the batteries are all 100 percent charged.
6. Place both Chromebooks next to the clock.

Running the test

1. Start the video camera.
2. Open Google Chrome from the shelf, and go to the bookmarked Web site.
3. Turn the power strip off, and note the time.
4. After both Chromebooks have fully discharged, review the video to determine when each Chromebook powered off.
5. Fully charge the Chromebooks.
6. Repeat steps 1 through 5 two more times.

Collaborating in a classroom

1. Simultaneously start the timer and power on the system.
2. When the login window appears, stop the timer, and record the result.
3. Enter the password, and press Enter.
4. Simultaneously start the timer and open Google Drive from the apps list.
5. Open the existing document.
6. When the document is fully displayed, stop the timer, and record the result.
7. Open Google Search from the apps list.
8. Type `birdhouse design`.
9. Simultaneously start the timer and click on Images.
10. When all images are displayed, stop the timer, and record the result.
11. Press Ctrl+T to open a new Chrome tab.
12. Type `birdhouse construction basics` and press Enter.
13. Simultaneously start the timer and open the Make a Birdhouse PDF link from www.dgif.virginia.gov.
14. When the PDF is fully displayed, stop the timer, and record the result.
15. Simultaneously start the timer and open the AutoCAD 360 app from the apps list.
16. When My Dashboard is fully displayed, stop the timer, and record the result.
17. Simultaneously start the timer and open the existing drawing.
18. When the project is fully displayed, stop the timer, and record the result.
19. Repeat steps 1 through 18 two more times.

Making a video

1. Simultaneously start the timer and power on the system.
2. When the login window appears, stop the timer and record the result.
3. Enter the password, and press Enter.
4. Simultaneously start the timer and open Google Docs from the shelf to open a new document.
5. When the document is fully displayed, stop the timer, and record the result.
6. Open the CourseSmart app from the apps list.
7. Simultaneously start the timer and select Read Now to open the textbook.
8. When the textbook is fully displayed, stop the timer, and record the result.
9. Press Ctrl+T to open a new Chrome tab.
10. Type `Wikipedia.org` and press Enter.
11. Type `Boston Tea Party`, and simultaneously start the timer and press Enter.
12. When the Wikipedia page is fully displayed, stop the timer, and record the result.
13. Open the Chrome tab for the document.
14. Simultaneously start the timer and open the WeVideo app from the apps list. If prompted to give offline access, select Accept.
15. When the list of projects is fully displayed, stop the timer, and record the result.
16. Select to create a new project.
17. Enter a name for the project and select Create.
18. Select the test project.
19. Simultaneously start the timer and select Create Video.
20. When the video editor is fully displayed, stop the timer, and record the result.
21. Press Ctrl+T to open a new Chrome tab.
22. Type `flickr.com` and press Enter.
23. In the search bar, type `Boston Tea Party Museum`.
24. Simultaneously start the timer and press Enter.
25. When all the images have fully loaded, stop the timer and record the result.
26. Scroll down and find Boston Tea Party Ship & Museum by Sebastian Bergmann.
27. Select the image.
28. Select the three dots on the right to expand the menu, and select Download / All sizes.
29. Select Original and download the image.
30. Open the Pixlr Touch Up app from the apps list.
31. Select My Computer.
32. Select the image.
33. Simultaneously start the timer and press Enter.
34. When the image is fully displayed, stop the timer and record the result.
35. Repeat steps 1 through 34 two more times.

Creating a presentation

1. Simultaneously start the timer and power on the system.
2. When the login window appears, stop the timer and record the result.
3. Enter the password, and press Enter.

4. Open YouTube from the apps list.
5. Type TED-Ed Shakespearean dating tips, and press Enter.
6. Click the link for the TED-Ed video.
7. Simultaneously start the timer and open Google Keep from the apps list.
8. When Google Keep is fully displayed, stop the timer and record the result.
9. Simultaneously start the timer and open Google Slides from the shelf to open a new presentation.
10. When the Presentation loads and the Choose a theme screen is fully displayed, stop the timer and record the result.
11. Select the Simple Light theme.
12. Simultaneously start the timer and open the Planetarium app from the apps list.
13. When the Planetarium app is fully displayed, stop the timer and record the result.
14. Open the Chrome tab for the presentation.
15. Simultaneously start the timer and open Google Maps from the apps list.
16. When Google Maps is fully displayed, stop the timer and record the result.
17. Type Verona, Italy and press Enter.
18. Simultaneously start the timer and select Street View.
19. When Street View is fully displayed, stop the timer and record the result.
20. Open the Chrome tab for the presentation.
21. Simultaneously start the timer and open Google Hangouts from the apps list.
22. When the invite screen is fully displayed, stop the timer, and record the result.
23. Repeat steps 1 through 22 two more times.

Doing homework online

1. Simultaneously start the timer and power on the system.
2. When the login window appears, stop the timer, and record the result.
3. Enter the password, and press Enter.
4. Simultaneously start the timer and open the GeoGebra app from the apps list.
5. When the GeoGebra app is fully displayed, stop the timer, and record the result.
6. Simultaneously start the timer and open Google Drive from the apps list.
7. Open the existing document.
8. When the document is fully displayed, stop the timer, and record the result.
9. Open the Chrome tab for the GeoGebra app.
10. Open the Design Something app from the apps list.
11. Click Explore, and sort by most popular models.
12. Simultaneously start the timer and open the LEGO® car (large model).
13. When the model is fully displayed, stop the timer, and record the result.
14. Press Ctrl+T to open a new Chrome tab.
15. Type ck12.org/trigonometry and simultaneously start the timer and press Enter.
16. When the page fully loads, stop the timer, and record the result.
17. Simultaneously start the timer and open YouTube from the apps list.
18. When YouTube is fully displayed, stop the timer, and record the result.
19. Click Watch Later.

20. Simultaneously start the timer and play the TED-Ed video.
21. When the video begins playing, stop the timer, and record the result.
22. Repeat steps 1 through 21 two more times.

WebGL rendering in an anatomy simulation

Setting up the test

1. Install the frames per second bookmarklet counter.
 - a. Open Google Chrome from the shelf.
 - b. Type `ricardocabello.com/blog/post/707`, and press Enter.
 - c. Drag and drop the Display Stats link to the bookmarks bar.
2. Close the Chrome window.
3. Open the BioDigital Human app from the app list.
4. Click Display Stats in the bookmarks bar.
5. In the omnibox, click the shield, and accept the warning to load unsafe script.

Running the test

1. Reload the page.
2. Select Conditions.
3. To enable the frames per second counter, click Display Stats in the bookmarks bar.
4. Select Pneumonia.
5. Once the app has fully rendered the image of the lungs, note the minimum number of frames per second in the range reported by the frames per second counter, and record the result.
6. Repeat steps 1 through 5 two more times.

APPENDIX C: DETAILED RESULTS

Figure 8 presents the detailed results, with battery life while browsing recorded in hours and the time to complete tasks in the scenarios recorded in seconds. We performed all tasks three times and used the median scores.

	Intel processor-powered Dell Chromebook 11	ARM processor-based HP Chromebook 11
Battery life while browsing		
Battery life while lightly browsing the Internet (higher is better)		
Run 1	11:23:00.00	06:06:00.00
Run 2	11:20:00.00	06:30:00.00
Run 3	11:22:00.00	06:06:00.00
Median	11:22:00.00	06:06:00.00
Collaborating in a classroom		
Time to turn on system (lower is better)		
Run 1	00:07.10	00:11.40
Run 2	00:07.20	00:11.40
Run 3	00:07.10	00:11.70
Median	00:07.10	00:11.40
Time to open existing document in Google Docs (lower is better)		
Run 1	00:10.70	00:22.40
Run 2	00:10.70	00:22.50
Run 3	00:10.80	00:22.10
Median	00:10.70	00:22.40
Time to search for image in Google Search (lower is better)		
Run 1	00:02.10	00:04.30
Run 2	00:02.10	00:04.50
Run 3	00:02.30	00:04.40
Median	00:02.10	00:04.40
Time to open PDF document (lower is better)		
Run 1	00:01.10	00:02.60
Run 2	00:01.30	00:02.70
Run 3	00:01.10	00:02.70
Median	00:01.10	00:02.70
Time to open AutoCAD 360 app (lower is better)		
Run 1	00:04.60	00:07.90
Run 2	00:04.60	00:07.70
Run 3	00:04.80	00:07.90
Median	00:04.60	00:07.90
Time to open existing drawing in AutoCAD 360 app (lower is better)		
Run 1	00:12.60	00:22.90
Run 2	00:12.80	00:22.40
Run 3	00:12.60	00:22.80
Median	00:12.60	00:22.80
Total time waiting	00:38.20	01:11.60

	Intel processor-powered Dell Chromebook 11	ARM processor-based HP Chromebook 11
Making a video		
Time to turn on system (lower is better)		
Run 1	00:07.10	00:11.50
Run 2	00:07.00	00:11.20
Run 3	00:06.90	00:11.40
Median	00:07.00	00:11.40
Time to open new document in Google Docs (lower is better)		
Run 1	00:04.20	00:10.20
Run 2	00:04.30	00:10.20
Run 3	00:04.30	00:10.10
Median	00:04.30	00:10.20
Time to open CourseSmart textbook (lower is better)		
Run 1	00:01.80	00:02.90
Run 2	00:01.60	00:03.10
Run 3	00:01.60	00:02.90
Median	00:01.60	00:02.90
Time to search Wikipedia (lower is better)		
Run 1	00:01.50	00:02.40
Run 2	00:01.40	00:02.60
Run 3	00:01.30	00:02.60
Median	00:01.40	00:02.60
Time to open WeVideo app (lower is better)		
Run 1	00:03.20	00:09.10
Run 2	00:03.00	00:09.20
Run 3	00:02.80	00:09.50
Median	00:03.00	00:09.20
Time to create new video in WeVideo app (lower is better)		
Run 1	00:08.10	00:15.00
Run 2	00:08.10	00:14.80
Run 3	00:08.00	00:15.10
Median	00:08.10	00:15.00
Time to search for image on Flickr (lower is better)		
Run 1	00:02.80	00:09.60
Run 2	00:02.80	00:10.00
Run 3	00:02.60	00:09.90
Median	00:02.80	00:09.90
Time to load image into Pixlr Touch Up app		
Run 1	00:07.50	00:16.00
Run 2	00:07.20	00:15.80
Run 3	00:07.10	00:16.20
Median	00:07.20	00:16.00
Total time waiting	00:35.40	01:17.20
Creating a presentation		
Time to turn on system (lower is better)		
Run 1	00:06.90	00:11.50
Run 2	00:07.20	00:11.20
Run 3	00:07.10	00:11.40

	Intel processor-powered Dell Chromebook 11	ARM processor-based HP Chromebook 11
Median	00:07.10	00:11.40
Time to open Google Keep (lower is better)		
Run 1	00:01.70	00:05.50
Run 2	00:01.90	00:05.00
Run 3	00:02.00	00:05.30
Median	00:01.90	00:05.30
Time to open new presentation in Google Slides (lower is better)		
Run 1	00:05.20	00:12.10
Run 2	00:05.50	00:11.90
Run 3	00:05.50	00:11.70
Median	00:05.50	00:11.90
Time to open Planetarium app (lower is better)		
Run 1	00:01.90	00:04.20
Run 2	00:01.70	00:04.00
Run 3	00:02.00	00:04.30
Median	00:01.90	00:04.20
Time to open Google Maps (lower is better)		
Run 1	00:03.50	00:06.90
Run 2	00:03.40	00:07.20
Run 3	00:03.70	00:06.80
Median	00:03.50	00:06.90
Time to enter Google Maps Street View (lower is better)		
Run 1	00:04.20	00:06.20
Run 2	00:04.10	00:06.50
Run 3	00:04.20	00:06.00
Median	00:04.20	00:06.20
Time to start new Google Hangouts call (lower is better)		
Run 1	00:06.90	00:11.70
Run 2	00:06.90	00:11.90
Run 3	00:06.70	00:12.10
Median	00:06.90	00:11.90
Total time waiting	00:31.00	00:57.80
Doing homework online		
Time to turn on system (lower is better)		
Run 1	00:06.90	00:11.40
Run 2	00:07.00	00:11.50
Run 3	00:07.10	00:11.30
Median	00:07.00	00:11.40
Time to open GeoGebra app (lower is better)		
Run 1	00:03.70	00:07.60
Run 2	00:03.50	00:07.50
Run 3	00:03.60	00:07.50
Median	00:03.60	00:07.50
Time to open existing document in Google Docs (lower is better)		
Run 1	00:10.70	00:22.40
Run 2	00:10.80	00:22.20
Run 3	00:10.60	00:22.10

	Intel processor-powered Dell Chromebook 11	ARM processor-based HP Chromebook 11
Median	00:10.70	00:22.20
Time to open 3D model in Design Something app (lower is better)		
Run 1	00:05.10	00:09.20
Run 2	00:05.30	00:09.60
Run 3	00:05.00	00:09.40
Median	00:05.10	00:09.40
Time to open CK-12 trigonometry lesson (lower is better)		
Run 1	00:02.60	00:04.60
Run 2	00:02.40	00:04.60
Run 3	00:02.40	00:04.50
Median	00:02.40	00:04.60
Time to open YouTube (lower is better)		
Run 1	00:04.10	00:07.40
Run 2	00:03.80	00:07.40
Run 3	00:03.80	00:07.60
Median	00:03.80	00:07.40
Time to play TED-Ed video (lower is better)		
Run 1	00:01.80	00:06.00
Run 2	00:01.60	00:06.30
Run 3	00:01.60	00:06.50
Median	00:01.60	00:06.30
Total time waiting	00:34.20	01:08.80
WebGL rendering		
Frames per second while rendering an anatomy simulation (higher is better)		
Run 1	49	27
Run 2	49	28
Run 3	47	30
Median	49	28

Figure 8: Detailed results.

ABOUT PRINCIPLED TECHNOLOGIES



Principled Technologies, Inc.
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We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

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