

STUDENTS AND TEACHERS WORK HARD. THEIR DEVICES SHOULD TOO.

EXECUTIVE SUMMARY

Many students and teachers rely on technology every day. Teachers frequently prepare lesson plans; students use apps and multimedia for learning; and both groups regularly share messages and files. With so many aspects of education riding on modern technology, devices need to be held accountable for performance in the same way that the students and teachers who use them are.

To find out which device offers the better learning experience for middle-school and high-school students, our team at Prowess Consulting put two devices to the test: the Intel® processor–powered Microsoft® Surface™ 3, running Windows® 10, and the Apple® iPad® 2, powered by a processor based on ARM® architecture. Additionally, in order to discover which tablet delivered a richer experience for teachers, we tested a Microsoft Surface Pro 4, running Windows 10, against the Apple® iPad Pro™.

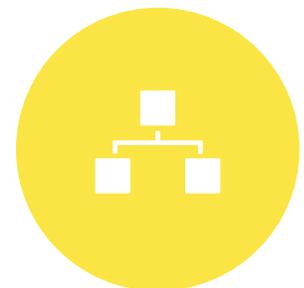
We ran the student devices through two typical classroom scenarios, one for middle school and another for high school. For the teacher devices, we devised a typical lesson-planning scenario. In each scenario, and in nearly every task, the 2-in-1 Microsoft Surface devices outperformed the iPad devices by offering the following benefits to both students and teachers:



Faster load times
to increase learning time



Smooth group collaboration
with tools that work together



Seamless workflows
that save time for teachers

Which Device Best Serves Today's Tech-Savvy Students?

Students in today's classrooms have been raised on touch technology; they speak the language of tablets. That's one reason that tablets are a good choice for classroom use—there isn't a lot of time wasted with teaching the users how to interact with the device. But not all tablets are created equal. A 2-in-1 device delivers the best in tablet computing while simultaneously offering all the familiar, more powerful offerings of a computer.

To examine the differences between a tablet and a 2-in-1 device for both students and teachers, our team at Prowess Consulting put two sets of devices to the test in authentic education scenarios. The mobile devices that we tested were:

- **For students:** The Microsoft Surface 3 and the Apple iPad 2 for both the middle-school and high-school classroom
- **For teachers:** The Microsoft Surface Pro 4 and the Apple iPad Pro for secondary-education instructors

We ran the devices through typical classroom and lesson-planning scenarios that students and teachers might encounter. We designed the tests to determine which device can provide all the capabilities needed to execute day-to-day classroom and lesson-planning tasks with precision, efficiency, and ease.

The results are clear: the Intel processor–powered Microsoft Surface 3 and Microsoft Surface Pro 4 consistently scored higher in the education setting than the iPad 2 and iPad Pro tablets because the Microsoft Surface 2-in-1 devices offer:

- **Faster load times** and full 2-in-1 functionality, which helps increase learning time
- **Smoother group collaboration** with tools that work together
- **Seamless workflows** that save time and headaches for teachers

Free Up Learning Time for Students and Planning Time for Teachers

Even the smallest distractions can wreak havoc on classroom learning. Students and teachers need devices that limit the time spent waiting for programs to load or to work properly. Less time waiting results in more time learning.

Our test results show that the Microsoft Surface 3 and Microsoft Surface Pro 4 offer more capabilities and perform better across the board on almost every task that we timed and tested; these results go beyond processing speed. Functionality differences play a big role in time savings as well. For instance, the Microsoft Surface 3 and the Microsoft Surface Pro 4 support multitasking by using a customizable split-screen layout. On the other hand, the iPad 2 cannot split the screen, and the iPad Pro supports a more limited split-screen layout with



About

2 WEEKS

of learning time saved over 3 years with the Microsoft® Surface™ 3¹

only a handful of apps, which hampers the ability of students and teachers to stay organized or to complete tasks efficiently. The Microsoft Surface 2-in-1 devices support the full versions of the Microsoft® Office Suite, whereas the app versions of many common programs like Microsoft® Excel® for iPad are noticeably limited

and clumsy. The Microsoft Surface 2-in-1 devices support a vast array of multimedia players, while the iPad 2 and iPad Pro cannot play content that uses Adobe® Flash®. Additionally, the Microsoft Surface devices offer a touchpad for precise mouse control; the iPad keyboard accessories do not include a touchpad.

All of the capabilities that the iPad devices lack can add up to a lot of lost time; the detailed time charts for each of our test scenarios are included in the following sections. Based on the numbers from those timed tests, we did some calculations to help you see how your seconds spent waiting can add up quickly to minutes, hours, and even weeks lost.

Table 1 shows the estimated time savings for students using the Microsoft Surface 3 in our scenarios. The time savings from using the Microsoft Surface 3 over the iPad 2 equate to nearly 18.1 hours of lost learning time over one school year and a staggering 54.3 hours of lost learning time over the life of the device (based on a three-year life cycle).¹ That's nearly two weeks of direct classroom learning time that students would get if their districts invested in the Microsoft Surface 3 for student use compared to if they used the iPad 2.

Table 1. The significant time savings for students using the Intel® processor-powered Microsoft® Surface™ 3

Estimates based on two student scenarios per school day over one school year*	Time saved using the Microsoft® Surface™ 3, as compared to the Apple® iPad® 2
Time saving per week	30 min
Time savings per month	3.1 hours = nearly half of a school day
Time savings per school year	18.1 hours = almost three full school days
Time savings over a three-year life cycle	54.3 hours = almost two weeks

* Estimates based on National Center for Education Statistics, which shows that the average class time per day in U.S. schools is 6.64 hours and the average number of school days per year is 180. "Schools and Staffing Survey." https://nces.ed.gov/surveys/sass/tables/sass0708_035_s1s.asp.

The time savings don't end with student devices, either. We also tested how well the Microsoft Surface Pro 4 and the iPad Pro would perform for teachers. Our tests show that, over a three-year device life span, a teacher can save just over three full school days if she uses the Microsoft Surface Pro 4 to plan a lesson, instead of using an iPad Pro (see Table 8).¹

Help Students Collaborate with Ease and Efficiency

Group work is a huge part of classroom learning and a necessary activity to help prepare students for a future collaborating with coworkers, family members, and peers. Collaborative, online tools like Edmodo® and Microsoft® OneNote® can help groups work smarter and produce a higher quality end result and experience. Additionally, group work helps foster

student-lead learning, to wean the students off teacher-directed instruction. According to a 2014 Bill & Melinda Gates Foundation survey, when teachers look for digital tools, 60 percent of the time they are looking for help that support this kind of student-driven, independent collaboration.²



The Microsoft® Surface™ 3 is, on average,

48% FASTER

at supporting collaborative tools compared to the Apple® iPad® 2.³

In our studies, the Intel processor–powered Microsoft Surface devices consistently outperformed the iPad devices by significant margins when loading and running collaboration apps like Microsoft OneNote and Edmodo.

Simplify Workflows for Teachers

Teachers rely on the ease of use and fast performance of their devices to create lessons. Our tests were designed to find out which device best supports these needs. The 2-in-1 Microsoft Surface Pro 4 scored consistently higher than the iPad Pro in the classroom because it offers:

- Seamless workflows and fast functionality from the Intel® Core™ m3 processor, Windows 10 operating system, and Microsoft Office applications
- Higher productivity through capabilities like screen sharing and the use of a stylus

MICROSOFT® SURFACE™ PRO 4 VS. APPLE® IPAD PRO™: THE HARDWARE-CHALLENGE

Teachers need a productive writing tool.



Microsoft® Surface™ Pen

Included

Magnetic strip holds pen when not in use

Converts handwriting to text

Includes top, right-click, and erase buttons

Works with more applications and offers more capabilities in Microsoft® Office Suite

Supports handwriting to fill out fields

Can launch Microsoft® OneNote®, even in lock screen, for quick notetaking

Apple Pencil™

\$99, not included⁸

Uses the Apple® Lightning® connector to charge, sticks out and could be easy to snap off

No place to store the Apple Pencil when not in use, easy to lose

When working in OneNote and other apps, must manually switch back to stylus mode to write

Works with only a few applications

Does not have built-in eraser

Current Edmodo® limitations on Apple® iPad® devices:*

1. Users cannot edit sent posts.
2. Students cannot access the My Planner function.
3. Teachers cannot create or grade quizzes.
4. Teachers cannot view quiz results.
5. Teachers cannot change the About Me section.
6. Teachers cannot send posts to parent groups.
7. Parents need to download a separate “parent” app for access.
8. Users cannot create small groups.
9. Users cannot see assignment revisions.
10. Users cannot annotate.

*As of January 2016

Educators are told that technology will save classroom time and make their jobs easier. But as one teacher observed in the Bill & Melinda Gates Foundation survey, “90 percent of it [new technology] is useless, which takes a while to figure out—and more time wasted.”²

Familiar workflows and tool functionality on devices could help make good on the promise of saving classroom time and making teachers’ jobs easier but relearning iPad app versions for tools like Microsoft Office wastes teachers’ time. On the 2-in-1 Microsoft Surface Pro 4, teachers can get right to work instead of teaching themselves new workflows.

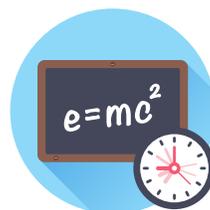
Teachers rely on collaboration just as much as students do. A 2014 survey found that 91 percent of teachers use technology to find or share lesson plans, and 57 percent use technology to collaborate with other teachers.⁵ In both cases, the search for effective tools should extend beyond just cloud-based, collaborative software. The hardware running that software greatly impacts the software’s efficacy.

Classroom Test and Scenario Results

The following scenarios compare the classroom experience for a middle-school math activity and a high-school history project on a Microsoft Surface 3 and an Apple iPad 2. The scenarios also examine the experience for a teacher planning lessons on both the Microsoft Surface Pro 4 and an Apple iPad Pro. Each scenario describes the student tasks involved in the activity and then highlights our test results, the functionality differences, and the timed results for processor performance. For a step-by-step guide to our test procedures, and for all timed-test results, see Appendix B.

Scenario 1: World-Population Data Analysis in a Sixth-Grade Math Class

Meet Hadley—a sixth grader.⁶ As she walks into her classroom, she reads directions on the whiteboard that instruct her to use the device on her desk to open Edmodo, a learning-management system. There, she learns that she needs to study world-population numbers online, in addition to capturing and annotating a screenshot. She transposes relevant data from her research into Microsoft Excel charts. She then interacts with an Adobe Flash visual diagram. When she finishes these steps, she uses Microsoft® Sway to build a digital presentation. Finally, because she has extra time, she plays a math game on DreamBox®.



The Microsoft® Surface™ 3 is **2x faster** at completing the math-class tasks than the Apple® iPad® 2

STUDENTS CAN WORK 50 PERCENT FASTER ON THE MICROSOFT® SURFACE™ 3

If the device on Hadley’s desk is an Apple iPad 2, she’ll encounter time delays and functionality issues almost immediately. The iPad 2 finally loads the Edmodo app (in nearly twice the time of the Microsoft Surface 3), and Hadley navigates to the world-populations website, where she takes a quick screenshot that she can later annotate.

If the device on Hadley’s desk is a Microsoft Surface 3, she can fly through the task of annotating a web page. The Microsoft Surface 3 has the Microsoft® Edge browser, which includes a “write-on-web” feature built right in. This feature makes annotating a web page fast and easy: 96 percent faster than with the iPad 2, with 15 fewer steps to endure. It also requires less switching back and forth between apps. The iPad 2 slows Hadley down because she has to open a separate annotating app, Evernote® Skitch. She then has to navigate to her saved screenshot and wait for it to load. On top of that, the app itself has glitches and is not intuitive, so Hadley must spend extra time familiarizing herself with it.

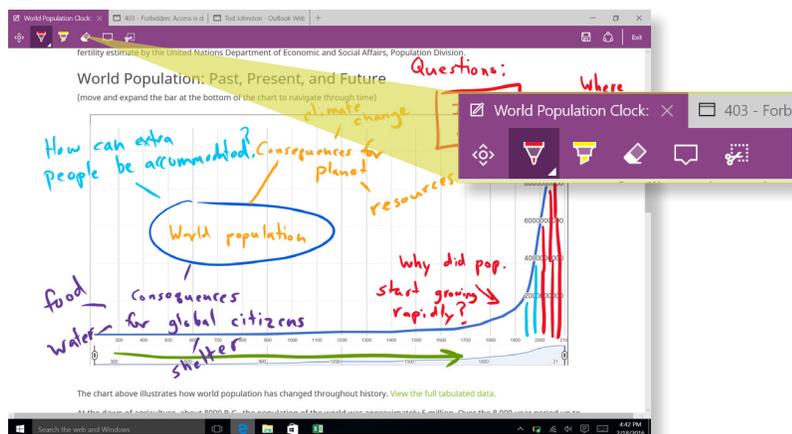


Figure 1. The Microsoft® Surface™ 3 has the Microsoft® Edge browser, which offers a “write-on-web” feature that saves students and teachers time when they take notes and gather research

After annotating the web page, Hadley must then transfer several sets of numbers to an Excel spreadsheet in order to visualize the data in a chart that she’ll create. Because the iPad 2 requires so much back-and-forth switching between apps, copying and pasting data into the spreadsheet takes Hadley four times as long as on the Microsoft Surface 3. That’s because the Microsoft Surface 3 supports split-screen functionality that lets Hadley copy a number from the left side of her screen and paste it onto the right, without toggling in and out of either program. This not only makes Hadley more efficient, it ensures more accurate data transfer. The iPad 2 does not offer split-screen functionality.

The split-screen view is not the only limitation that the iPad 2 presents for Hadley. When she follows instructions to visit the National Geographic® EarthPulse® map, she encounters a total work stop. The map uses Adobe Flash, which is not supported on iPad devices. This brings Hadley’s task to a halt, and forces her to instead walk to one of the classroom desktop

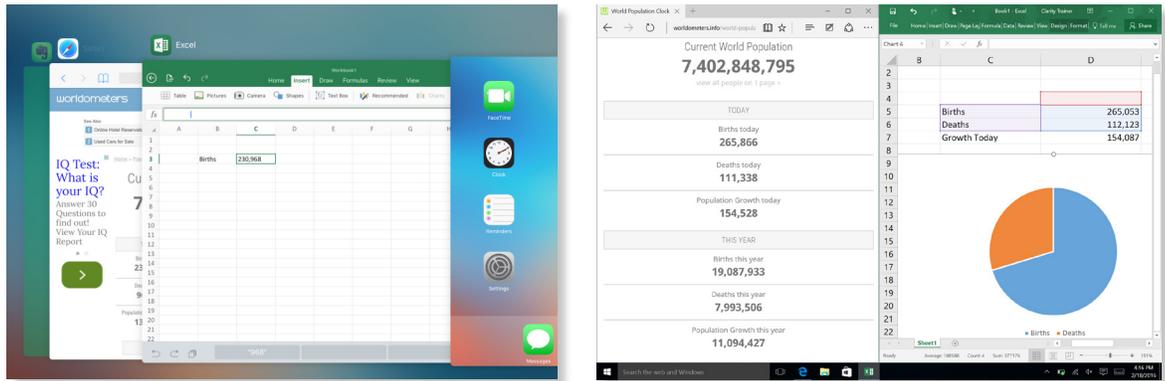


Figure 2. The split-screen capability of the Microsoft® Surface™ 3 (right) allows students to work more productively versus the multiple steps and constant switching that students must perform to complete the same task on the Apple® iPad® 2 (which cannot split the screen)

computers and wait her turn to see the visualization. That is, unless Hadley uses a Microsoft Surface 3, which supports a wide range of multimedia platforms, including Adobe Flash. In this case, Hadley can quickly finish the task to visualize the impact that the human population is having on the world today.

Visualization is a key part of understanding data. Knowing this, Hadley’s teacher instructs the students to interact with a visual animation of population models in GeoGebra®. GeoGebra, like many other software programs that perform data visualization, is CPU intensive. The Intel processor–powered Microsoft Surface 3 loads the content-heavy webpage 44 percent faster than the iPad 2, and it plays the animation 25 percent faster. Overall, the entire task takes Hadley 27 percent longer on the iPad 2.

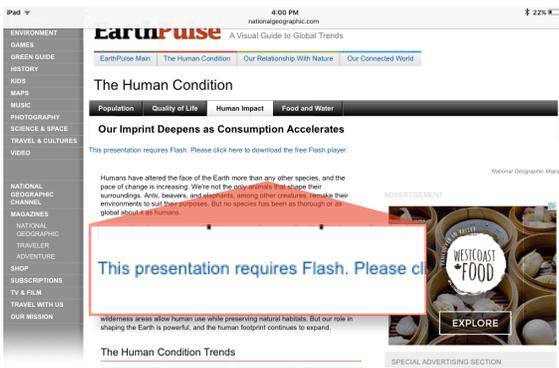


Figure 3. The Apple® iPad® 2 and Apple® iPad Pro™ cannot display Adobe® Flash® content

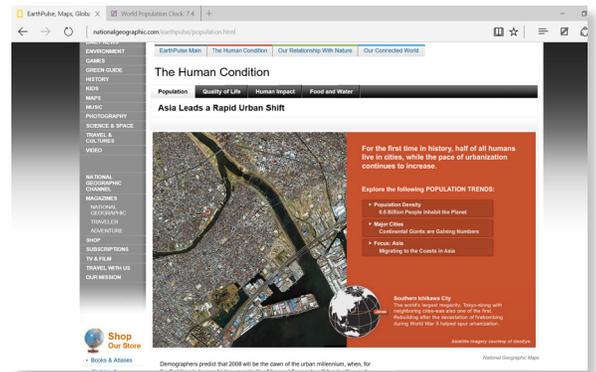


Figure 4. The Microsoft® Surface™ 3 supports Adobe® Flash®; though Flash is being gradually phased out of use, many legacy educational tools still rely on it

Hadley is now ready to build her Microsoft Sway presentation. But Sway looks so different on the iPad 2 that Hadley wonders if it’s even the same program as the one she used on the school’s desktop PC. She cannot use it the same way, so she takes the time to teach herself how to make it work. In addition to the learning curve, Sway for iPad doesn’t offer the same rich content-creation experience as the full desktop program on the Microsoft Surface 3.

Table 2. Feature comparison of the popular education program, Microsoft® Sway, as seen on the Apple® iPad® 2 and the Microsoft® Surface™ 3

Microsoft® Sway Feature	Apple® iPad® 2	Microsoft® Surface™ 3
Drag and drop	✗	✓
Suggested insertions	✗	✓
Integration with other programs (such as Microsoft® OneDrive®, Microsoft® OneNote®, Facebook®, Flickr®, Bing®, PicHit, YouTube™, Twitter®, camera, and uploads)	✗ Integrates only with photos	✓
Add charts or HTML	✗	✓
Resize photos while building a timeline	✗	✓
Style templates	21	30
Sharing options	1	5
Tutorials	0	1

On the Microsoft Surface 3, Hadley returns to the Edmodo window. From there, she clicks on the DreamBox URL. She can access the math game right away. On the iPad 2, Hadley has to note the classroom code given in Edmodo, and then tap to open the DreamBox Learning® app. The app version of the program is an impediment to her assignment, costing her twice as much time to complete the activity.

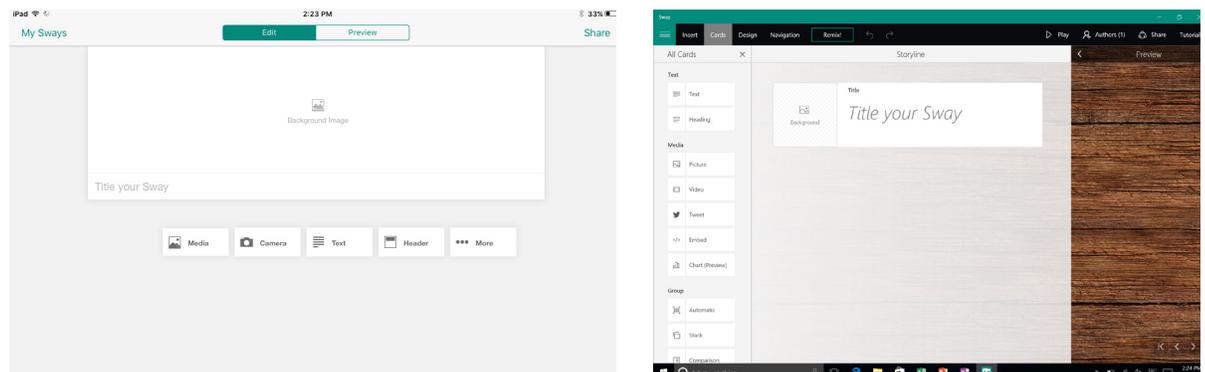


Figure 5. A comparative view of the Microsoft® Sway interface on the Apple® iPad® 2 (left) versus the interface on the Microsoft® Surface™ 3 (right); the applications look completely different, which can cause time delays as students learn the app version

Table 3 shows how much faster Hadley can complete the individual tasks in this scenario on the Microsoft Surface 3. We added up all the timed tasks tested for the entire math class, and found that the Microsoft Surface 3, powered by an Intel® Atom™ x7 processor, ended up being two times faster than the Apple iPad 2. Faster loading times mean less time waiting and fewer opportunities for distraction, which equates to more time for student learning.

Table 3. Results of the timed tests for a math-lesson scenario; full task list and times are in Appendix B

Math-Class Tasks	Microsoft® Surface™ 3 performed faster than the Apple® iPad® 2
Open Edmodo® and load the assignment	2.3x faster
Annotate on a web page/screenshot	2.2x faster
Transpose and graph data in Microsoft® Excel®	3.8x faster
Use Adobe® Flash®	Apple iPad does not support Adobe Flash
Explore a GeoGebra® model	1.4x faster
Create a Microsoft® Sway presentation	1.1x faster
Perform DreamBox® math exercises	2.3x faster
Total time for the world-population scenario	2x faster

Scenario 2: The Compromise-of-1850 Lesson in an Eleventh-Grade U.S. History Class

Jesse is an eleventh-grade student working on a U.S. history project.⁶ He and two other students, Carlita and Gloria, are tasked with compiling and presenting a mini-lesson to their peers about the Compromise of 1850.⁶ To begin, Jesse captures source material and annotates screenshots. He shares his findings with his partners, in addition to reviewing their results and feedback. The group works together to create a slide deck and quiz to present to their teacher and peers.

STUDENTS CAN COLLABORATE 48 PERCENT FASTER USING THE MICROSOFT SURFACE 3

Jesse gets to work on his part of the group project, a simple Internet search for primary-source documents regarding the Compromise of 1850. However, by using the iPad 2, he has to wait 55 percent longer to launch his device’s browser (Safari®), display the search results, and load the actual results than if he uses the Microsoft Surface 3.

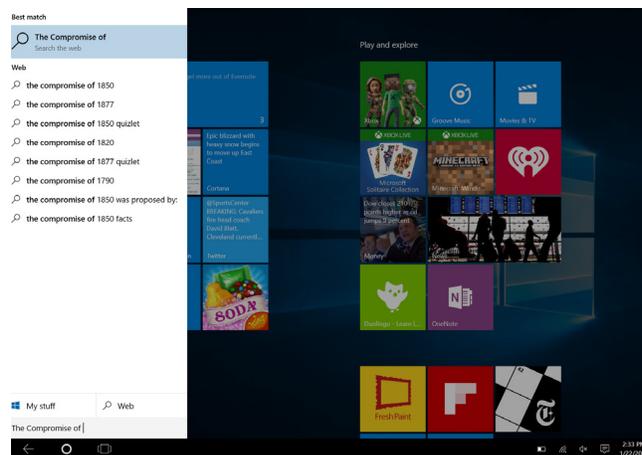


Figure 6. Windows® 10 on the Microsoft® Surface™ 3 features the time-saving ability to perform Internet and device searches simply by beginning to type on the keyboard

For only \$0.27 per device per day more than the Apple® iPad® 2 over the device’s life cycle, students can be 78 percent more productive when their districts invest in the Microsoft® Surface™ 3.⁴

The delay is due in large part to the slower processing speed of the iPad 2, but it is also affected by the iPad device’s poor functionality for typing and selecting. On the Microsoft Surface 3, Jesse can search the Internet by using a full-size keyboard with a touchpad, which allows for more precise typing and ease for selecting results. The iPad keyboard is so tiny that Jesse keeps having to delete and start over. Additionally, when the touch technology has glitches, or when web pages or programs are not optimized for mobile use, selecting results can be almost impossible. This is where it’s necessary to have a trackpad acting as a mouse in order to keep working. If Jesse uses an iPad, he does not have this option.

As a result of his Internet research, Jesse finds a YouTube™ video about Henry Clay, one of the major players in the Compromise of 1850. Jesse wants to take notes in his shared OneNote notebook while watching the video. On the Microsoft Surface 3, he has several options. He can use the OneNote “dock-to-desktop” feature, which allows him to consume other content and simultaneously take notes in OneNote. He can also slide his finger in from the left edge of the screen to bring up the OneNote app, which he can then drag and release to initiate the handy split-screen view. He can also use keyboard shortcuts (using the Windows key and the arrow keys) to split the screen. By doing so, Jesse can multitask 56 percent faster than if he used an iPad 2, which has no split-screen functionality.

If Jesse uses the iPad 2, he has to stop the video, tap out of YouTube, tap back to OneNote, tap the page that he wants for notetaking, jot down his notes, then tap out of OneNote and back into YouTube in order to resume the video. The Microsoft Surface 3 not only enables a faster workflow, but it can result in more accurate notetaking because Jesse has no opportunity to forget what he wanted to jot down, which he might by the time he opens the OneNote for iPad app.

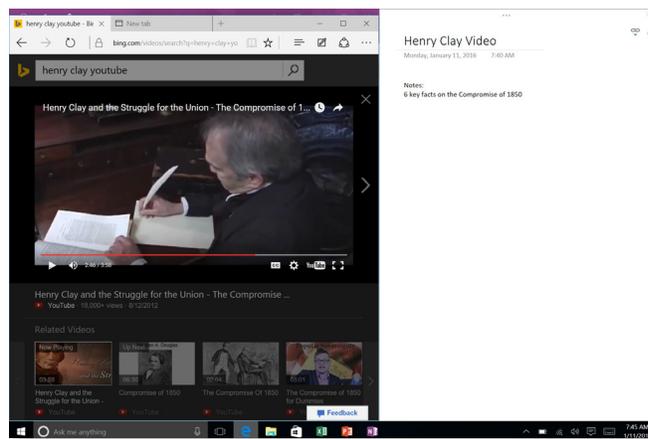


Figure 7. The Microsoft® Surface™ 3 has the ability to stream a video (left) while simultaneously taking notes in Microsoft® OneNote® (right)

As the students conduct their research, OneNote on the Microsoft Surface 3 automatically captures URLs from pasted web content, effectively compiling a bibliography for the team.



The Microsoft® Surface™ 3 completed history-class tasks

65% faster
than the Apple® iPad® 2.

The iPad 2 requires not only a copy and paste of the web content, which is very awkward to do on the iPad, but students must also copy and paste the URLs for their sources. These extra steps result in over twice as much time spent creating a bibliography on the iPad 2.

One of the major wins of using the Microsoft Surface 3 for OneNote is shared, collaborative notebooks. These notebooks support instant and real-time group collaboration. In this scenario, Jesse can take notes, Gloria can add screenshots, and Carlita can begin compiling a list of quiz questions—all at the same time, and even on the same page.

The benefits of shared notebooks are lost on the iPad 2. The OneNote app for iPad does not allow users to copy and paste pages between notebooks. It takes students 5x longer on the iPad 2 than the Microsoft Surface 3 to share a notebook with their teacher or another user or to copy and paste entire OneNote pages into other notebooks. This is because students have to go back and forth between OneNote notebooks copying and pasting text boxes one by one.

Finally, Jesse and his teammates are ready to compile their completed project, creating a Microsoft® PowerPoint® presentation and a quiz based on their research material. Because PowerPoint has the Microsoft® Office Mix add-on, Jesse can create the quiz without exiting PowerPoint. Jesse's group can compile their presentation and create their quiz 71 percent faster on the Microsoft Surface 3 than if they tried to use the iPad 2.

If Jesse uses the iPad 2 instead, he cannot create a quiz inside PowerPoint. Because he has to launch a separate quiz-creation app, Kahoot!, and copy and paste text back and forth from PowerPoint into Kahoot, Jesse wastes over 40 percent of his valuable learning time on administrative tasks, rather than in actually absorbing the material.

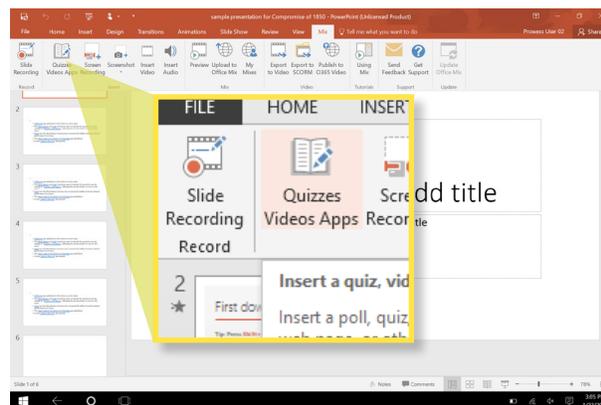


Figure 8. Microsoft® Office Mix is offered as a Microsoft® PowerPoint® add-on for the Microsoft® Surface™ device; Apple® iPad® users cannot get Office Mix

Table 4 shows how much faster the Microsoft Surface 3 completed the individual tasks in this scenario. Adding up all the timed tasks for the entire history class, the Microsoft Surface 3, powered by an Intel Atom processor, ended up being 65 percent faster than the Apple iPad 2. Faster loading times mean less time waiting and fewer opportunities for distraction, which can equate to more time for student learning.

Table 4. Results of timed processor tests for a typical history-lesson scenario; consult Appendix B for full task list and times

U.S. History-Class Tasks	Microsoft® Surface™ 3 performed faster than the Apple® iPad® 2
Search the Internet for primary documents	55% faster
Take notes while watching a video for research	56% faster
Collaborate with other students in Microsoft® OneNote®	51% faster
Create a Microsoft® PowerPoint® presentation	145% faster
Create a quiz	178% faster
Total time for U.S. history classroom scenario	65% faster

Only the Microsoft Surface 3 Makes the Grade

Table 5. The overall report card for each mobile device we tested

	WORKFLOWS Programs connect seamlessly to save steps	PERFORMANCE Time waiting to load programs	MULTITASKING Run split-screen functionality on multiple desktops
 Microsoft® Surface™ 3	A	A	A
 Apple® iPad® 2	F	F	F

***Grade Criterion:** A: Full or greater than 90 percent functionality for tested task B: partial (70 to 80 percent) functionality for tested task C: missing or less than 60 percent functionality for tested task.

Scenario 3: Language-Arts Teacher Plans a Lesson

Portia, an eighth-grade language-arts teacher, is developing a English Language Arts (ELA) Common Core–aligned persuasive-writing unit of study.⁶ This includes researching online lesson plans and persuasive-writing examples, and then collecting the results in a cloud-based, collaborative note-taking program. She locates previously used source material to append to her new findings. Once her unit is complete, she wants to invite other teachers in her district to digitally review and collaborate on her lesson plans.

TEACHERS CAN SAVE 94 PERCENT MORE TIME WITH SEAMLESS WORKFLOWS ON THE MICROSOFT SURFACE PRO 4

Before Portia begins her web search for lesson plans and persuasive-writing examples, she picks a note-taking platform where she can collect, annotate, and build her unit. She picks iTunes U[®] for the Apple iPad Pro, but she soon regrets her decision due to the continued interruptions to her normal, efficient workflow.

Portia likes a persuasive-writing example that she finds online, and she tries to share the entire web page by using iTunes U so that she doesn't have to transpose the information; however, she is unable to do this on the iPad Pro. She can only save web URLs to iTunes U, and only while in the app itself—never from where her research results reside. The iPad Pro supports very little interoperability between apps, causing Portia to teach herself new workflows.

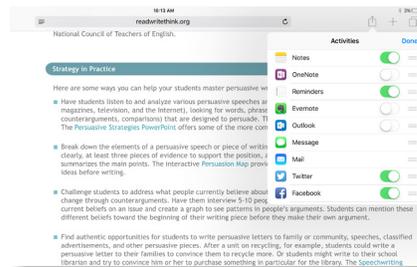


Figure 9. On the Apple[®] iPad Pro[™], users cannot send web content to iTunes U[®] from within a browser in order to build lesson plans with research findings; users can share web content only with the programs shown

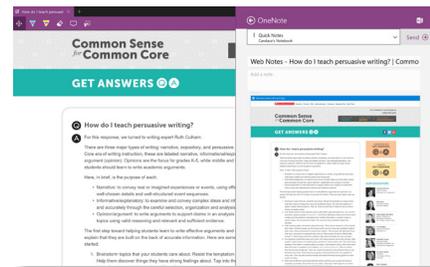


Figure 10. On the Microsoft[®] Surface Pro 4[™], users can save and send web content to Microsoft[®] OneNote[®] directly from a browser, making building lesson plans quick and easy

If Portia instead uses the Microsoft Surface Pro 4 for collecting web research, she can annotate directly on the web page by using the write-on-web feature available in the Edge browser—she can even use a responsive and handy stylus.⁷ (For more about the hardware and accessory differences between the tested devices, see the sidebar, “The Hardware Challenge.”) With the Microsoft Surface Pro 4, Portia annotates directly from the browser, and then—without ever leaving the browser—sends that annotated screenshot directly to OneNote, which not only saves the content, but also saves a link to the source so that Portia can return to the web page source at any time. By using the Microsoft Surface Pro 4, Portia completes her research and notetaking in half the time and half the steps that she needed with the iPad Pro.

Microsoft® Surface™ Pro 4 vs. Apple® iPad Pro™: The Hardware-Challenge

Students need an intuitive, comfortable keyboard and trackpad for mouse-control capabilities.



Microsoft® Surface™ Type Cover

\$129, not included⁸

Touchpad for mouse-control capabilities

Sturdy

Adjustable angle for laptop computing



Apple® Smart Keyboard

\$169, not included⁸

No touchpad for mouse-control capabilities

Less sturdy

Stand is stuck at a fixed angle, not ideal for laptop use

Portia decides to show Martin Luther King Jr.'s "I Have a Dream" speech to students as an example of persuasive writing. She wants them to view the video from inside the classroom's shared OneNote notebook that she created. But if Portia is building her unit in OneNote on the iPad Pro, she can only paste a URL to the video, not embed the actual video into OneNote. If she uses OneNote on the Microsoft Surface Pro 4, the students can watch the video without ever leaving OneNote. Portia doesn't have to worry about students getting distracted by other videos available on YouTube instead of staying on task.

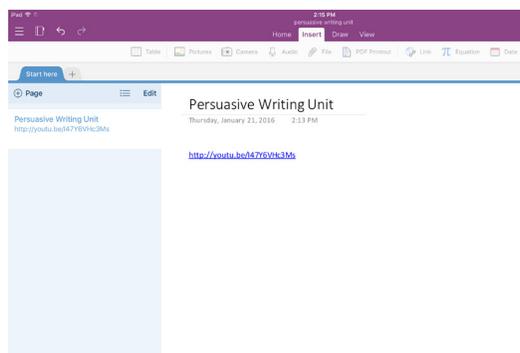


Figure 11. Users of the Apple® iPad Pro™ cannot embed YouTube™ videos directly into Microsoft® OneNote®, so students must leave OneNote and go to YouTube

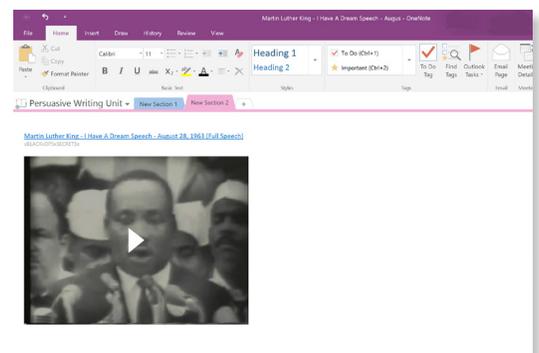


Figure 12. With the Microsoft® Surface™ Pro 4, teachers can embed YouTube™ videos directly into Microsoft® OneNote®, so students stay in OneNote to view the content

Multitasking: More Than Splitting Screens

The Microsoft® Surface™ Pro 4 2-in-1 device enables multitasking capabilities that extend far beyond splitting a screen, including support for every accessory and function that a Windows® 10 PC offers:

- **Multiple windows:** In landscape or portrait mode, several apps can take as much of the screen as needed.
- **Snap to corner:** Apps can snap into the corner for a one-quarter viewing of the screen.
- **Virtual desktops:** Manage several desktop layouts on the main screen at the same time with the ability to seamlessly swap between layouts.
- **Multiple apps instances:** Open several instances of the same app at the same time, with different content in each instance.
- **Extended desktop with multiple monitors or projectors:** Project to and manage several monitors, each with its own desktop layouts, and with seamless movement between the monitors.

Apple has launched split-screen view on the Apple® iPad Pro™ as part of iOS® 9. The iPad Pro supports two multitasking modes—a split view and a slide-over view.

- **Slide-over view** renders on one quarter of the screen on the right; the right side is dynamic while the left is static. Users cannot work in both screens.
- **Split view** adjusts across the width of the screen, and both screens are simultaneously interactive.

Many apps, if not most, still do not support the full split-screen capability, and **only two out of seven** that we tested supported the slide-over view.

Next, Portia needs to find a Microsoft® Word document that contains a rubric that she saved in Microsoft® OneDrive® in order to incorporate the rubric into her new unit plan. On the iPad Pro, locating this document and adding it to iTunes U takes 41 percent more of Portia's planning time than it does for a similar workflow on the Microsoft Surface Pro 4. That number skyrockets if Portia has to install and configure the OneDrive app; in that case, she spends 5 times longer locating and using previous course material.

Because OneDrive on the Microsoft Surface Pro 4 syncs to Portia's desktop file manager, it is much easier for her to locate and use previous course materials. She doesn't need to download a new app or navigate through an unfamiliar workflow.



The Microsoft® Surface™ Pro 4 completed lesson planning

72% faster

than the Apple® iPad Pro™.

Lastly, Portia wants to share her new lesson plan with her department colleagues.

iTunes U limits shares to five people. Additionally, she is limited to sharing only with known Apple® IDs—not her colleagues' work email addresses. If her colleagues don't have Apple IDs, or if Portia doesn't know their IDs off the top of her head, her sharing experience is cut short.

Once again, OneNote on the Microsoft Surface Pro 4 helps Portia more effectively collaborate with her department. She can add any user she likes by using teachers' work or personal email addresses.

Overall, using the Microsoft Surface Pro 4 provides Portia a less disruptive, more seamless experience because of the interoperability of programs and apps, including support for every accessory and function that a Windows 10 PC offers. This helps Portia stay organized and get her planning done more quickly.

Table 6 shows how much faster the Microsoft Surface Pro 4 completed the individual tasks in this scenario. Adding up all the timed tasks for the entire lesson plan, the Microsoft Surface Pro 4, powered by an Intel Core m3 processor, ended up being 72 percent faster than the Apple iPad Pro.

Table 6. Results of the timed processor tests for the teacher lesson-planning scenario; consult Appendix B for full task list and times

Lesson-Planning Tasks	Microsoft® Surface™ Pro 4 performed faster than the Apple® iPad Pro™
Internet search	82% faster
Organize research in Microsoft® OneNote®	59% faster
Add a Microsoft® Word document to course materials	53% faster
Add a YouTube™ video to course materials	73% faster
Collaborate with the department	15% faster
Total time for lesson-planning scenario	72% faster

Only the Microsoft Surface 4 Pro Makes the Grade

Table 7. The overall report card for each mobile device we tested

	WORKFLOWS Programs connect seamlessly to save steps	PERFORMANCE Time waiting to load programs	MULTITASKING Run split-screen functionality on multiple desktops
 Microsoft® Surface™ Pro 4	A	A	A
 Apple® iPad Pro™	F	F	C

***Grade Criterion:** A: Full or greater than 90 percent functionality for tested task B: partial (70 to 80 percent) functionality for tested task C: missing or less than 60 percent functionality for tested task.

These tasks translate into precious time savings for Portia, shown in Table 8. In the course of a device's three-year life cycle, she can get back just over three full school days.¹ Time spent teaching instead of tinkering with inefficient technology is a huge win for instructors.

Table 8. Simple and familiar workflows save time for instructors with the Intel® processor–powered Microsoft® Surface™ Pro 4¹

Estimates based on one teacher scenario per school day over one school year*	Time saved using the Microsoft® Surface™ Pro 4, as compared to the Apple® iPad Pro™
Time savings per week	12 min
Time savings per month	50 min
Time savings per school year	7 hours = over 1 school day
Time savings over a three-year life cycle	21 hours = just over 3 school days

* Estimates based on National Center for Education Statistics, which shows that the average class time per day in U.S. schools is 6.64 hours and the average number of school days per month as 21 and per year as 180. "Schools and Staffing Survey." https://nces.ed.gov/surveys/sass/tables/sass0708_035_s1s.asp.

Seamless Workflows Make the Microsoft Surface 3 and Microsoft Surface Pro 4 Ideal for Education

Microsoft Surface devices powered by Intel processors earned top grades as the devices that best support and enhance both student learning and teacher planning in education. The Microsoft Surface 3 and Microsoft Surface Pro 4 2-in-1 devices were easier to use, offered a familiar Windows experience, and provided richer functionality than the Apple iPad devices.

The Apple iPad devices had difficulty keeping up with the performance and collaborative abilities of the Microsoft Surface devices, leading to frustration for teachers and hours of lost learning time for students over the course of the school year. Aside from lost hours, the iPad users experienced enough complications in their workflows that educators might reconsider their effectiveness as a tool in the classroom.

In our study, the Microsoft Surface 3 and Microsoft Surface Pro 4, powered by Intel processors, performed consistently faster, more reliably, and with greater ease of use than the iPad 2 and iPad Pro. Students and teachers are expected to perform at their best every single day; they should have devices that are held to the same standard.

Students and teachers are expected to perform at their best every single day; they should have devices that are held to the same standard.

Appendix A: Test Environment

Device	Microsoft® Surface™ 3	Microsoft Surface Pro 4	Apple® iPad® 2	Apple® iPad Pro™
OS	Windows® 10	Windows 10	iOS® 9.2	iOS 9.2
Processor	Intel® Atom™ x7-Z8700 processor	Intel® Core™ m3 processor	Apple® A5 processor	Apple® A9x processor
Storage	64 GB	128 GB	16 GB	32 GB
Memory (RAM)	2 GB	4 GB	500 MB	4 GB
Display	10.8 inches	12.3 inches	9.7 inches	12.9 inches
Resolution	1920 x 1280	2736 x 1824	1024 x 768	2732 x 2048
Graphics	Intel® HD Graphics 4400	Intel HD graphics 515	Built into processor	Built into processor
Ports	Full-size USB 3.0 Mini DisplayPort (mDP) microSD™ card reader Micro USB charging port Headset jack Cover port Built-in speaker Microphone	Full-size USB 3.0 mDP microSD card reader Headset jack Cover port Built-in speaker Microphone Microsoft Surface Connect	30-pin dock connector port 3.5-mm stereo headphone minijack Built-in speaker Microphone	3.5-mm headphone jack Apple® Lightning® connector port Built-in speaker Microphone
Camera	3.5 megapixel front-facing camera 8.0 megapixel rear-facing camera with autofocus	5.0 megapixel front-facing camera with 1080p HD video 8.0 megapixel rear-facing autofocus camera with 1080p HD video	Front camera VGA 720 pixel rear-facing	1.2 megapixel front-facing camera with 1080p HD video 8 megapixel rear-facing camera with 1080p HD video
Networking	Wi-Fi® (802.11 a/b/g/n/ac) Bluetooth® 4.0	Wi-Fi 802.11ac; IEEE 802.11a/b/g/n compatible Bluetooth 4.0	Wi-Fi (802.11a/b/g/n) Bluetooth 2.1 + EDR	Wi-Fi (802.11a/b/g/n/ac); dual channel (2.4GHz and 5GHz); HT80 with MIMO Bluetooth 4.2
Weight	1.37 lbs (622 g)	1.69 lbs (766 g)	1.33 lbs (601 g)	1.57 lbs (712 g)
Price at Time of Purchase⁸	\$499 Keyboard \$129	\$899 Keyboard \$129	\$319 Keyboard \$99	\$799 Keyboard \$169 Apple Pencil™ \$99

Software		
Scenario 1	Scenario 2	Scenario 3
Microsoft® Edge browser	Edge browser	Edge browser
Safari® browser	Safari browser	Safari browser
Edmodo®	Evernote Skitch	OneNote
Evernote® Skitch	Microsoft® OneNote®	iTunes U®
Microsoft® Excel®	Microsoft® PowerPoint®	Newsela®
GeoGebra®	Microsoft PowerPoint Office Mix add-on	Evernote Skitch
Microsoft® Sway	YouTube™	Microsoft® Word
DreamBox®	Kahoot!	Microsoft® OneDrive®

Network Speed	
Unless otherwise indicated, our tests were performed while devices were connected to an 802.11n wireless network. Network throughput fluctuates continually. We recorded network speeds at several points during the testing, and averaged the results. Averages are shown here.	
Upload Speed	19.4 Mbps
Download Speed	71.66 Mbps

Appendix B: Steps and Timed Test Results

Scenario 1: World-Population Scenario	
Microsoft® Surface™ 3	Apple® iPad® 2
Edmodo® Learning Management System	
1. Open Edmodo in the Microsoft® Edge browser.	1. Tap on the Edmodo app.
2. Log on.	2. Log on.
Time to complete steps: 22.38 sec	Time to complete steps: 25.85 sec
Edmodo Assignment	
1. Once logged on to Edmodo, tap Turn In for the world-population assignment.	1. Once logged on to Edmodo, tap Turn In for the world-population assignment.
2. Open the Microsoft® Word doc containing the assignment.	2. Open the Word doc with the assignment.
3. Tap the hyperlink in the Word doc for the world-population clock website.	3. Tap the hyperlink in the Word doc for the world-population clock website.
Time to complete steps: 11.97 sec	Time to complete steps: 21.09 sec
Annotate a Web Screen: Students Annotate a Webpage and Email It to Team-Member Collaborator	
1. Open the Write on Web feature by using the pencil icon in the upper left of Edge.	1. Press the Home and Power buttons simultaneously to take a screenshot.
2. Tap the pen icon to underline text.	2. Press the Home button.
3. Underline text.	3. Tap to open Evernote® Skitch.
4. Tap the highlighter to highlight text.	4. Tap to select screenshots.
5. Highlight text.	5. Tap to select an individual screenshot.
6. Tap the circle shape to draw on text.	6. Tap the square crop icon at center top to crop.
7. Circle text.	7. Drag to desired crop size.
8. Tap the strikethrough icon to strike through text.	8. Tap Crop Image to complete the crop.
9. Strike through text.	9. Tap the arrow icon at the bottom right to select the annotating tool.
10. Tap the arrow icon to select arrows.	10. Tap the pen icon.
11. Tap to draw an arrow on the page.	11. Tap and drag to underline text.
12. Tap to draw a second arrow on the page.	12. Tap the highlighter icon.
13. Tap to draw a third arrow on the page.	13. Tap and drag to highlight text.
14. Tap Share .	14. Tap the square icon to launch the shapes menu.
15. Tap Email .	15. Tap the circle icon.
16. Tap Send .	16. Tap and drag to circle text.
	17. Tap the circle icon to exit out of the shapes menu.
	18. Tap the a icon to launch the pen menu.
	19. Tap the pen icon.
	20. Tap and drag to strike through text.
	21. Tap the pen icon to exit out of the pen menu.
	22. Tap the arrow icon to launch the arrow menu.
	23. Tap and drag to draw one arrow.
	24. Tap and drag to draw a second arrow.
	25. Tap and drag to draw a third arrow.
	26. From the upper-right corner, tap the Share icon.
	27. Tap Mail to share via email.
	28. Tap To , and then type an email address
	29. Tap Send .
Time to complete steps: 32.34 sec	Time to complete steps: 63.52 sec

Scenario 1: World-Population Scenario

Transpose and Graph Data Using Microsoft® Excel®

1. Press the Windows key, and then search to find Microsoft Excel.
2. Press Enter.
3. Tap the Excel window, and then drag to the right to launch a split-screen view of both Excel and the Worldometers website.
4. In Excel, tap **Blank Workbook**.
5. Tap to place cursor in an Excel cell.
6. Type **7,398,936** into cell.
7. Press Enter.
8. Type **12,356,269** into cell.
9. Press Enter.
10. Type **200,555** into cell.
11. Tap **Insert**.
12. Tap **Recommended Charts**.
13. Tap **Cluster Column**.
14. Tap **OK**.

Time to complete steps: 36.94 sec

1. From the Home screen, tap the Microsoft Excel app.
2. Tap to open a blank worksheet.
3. Press the **Home** button twice to return to the Worldometers website.
4. Press and hold to launch the Copy menu.
5. Drag to copy **7,398,986**.
6. Tap **Copy**.
7. Tap **Select**.
8. Press the **Home** button twice to return to Excel.
9. Tap and hold on an Excel cell.
10. Tap **Paste**.
11. Press the **Home** button twice to return to the Worldometers website.
12. Tap and hold to launch the Copy menu.
13. Drag to copy **12,356,269**.
14. Tap **Copy**.
15. Tap **Select**.
16. Press the **Home** button twice to return to Excel.
17. Tap and hold on an on Excel cell.
18. Tap **Paste**.
19. Press the **Home** button twice to return to the Worldometers website.
20. Tap and hold to launch the Copy menu.
21. Drag to copy **200,555**.
22. Press the **Home** button twice to return to Excel.
23. Tap and hold on an Excel cell.
24. Tap **Paste**.
25. Tap **Insert**.
26. Tap **Recommended Charts**.
27. Tap **Cluster Column**.

Time to complete steps: 86.57 sec

Adobe® Flash®

1. In Edmodo, tap **Turn In**.
2. Tap to open the Word document.
3. Tap on the URL in the Word document <http://www.nationalgeographic.com/earthpulse/population.html>.
4. Tap the **Human Impact** tab.
5. Tap one of the three Adobe Flash options after the tab loads.

Time to complete steps: 29.24 sec

1. In Edmodo, tap **Turn In**.
2. Tap to open the Word document.
3. Tap on the URL in the Word document <http://www.nationalgeographic.com/earthpulse/population.html>.
4. Tap the **Human Impact** tab.
5. Work stop: Adobe Flash cannot play.

Time to complete steps: 19.10 sec

Explore GeoGebra® Model

1. In Edmodo, tap **Turn In**.
2. Tap to open the Word document
3. Tap on the URL in the Word document <http://tube.geogebra.org/student/m58931>.
4. Tap and hold to select **Natural Growth**.
5. Tap **Animation On** to put the model in motion.

Time to complete steps: 23.66 sec

1. In Edmodo, tap **Turn In**.
2. Tap to open the Word document
3. Tap on the URL in the Word document <http://tube.geogebra.org/student/m58931>.
4. Tap and hold to select **Natural Growth**.
5. Tap **Animation On** to put the model in motion.

Time to complete steps: 36.08 sec

Scenario 1: World-Population Scenario

Use Microsoft® Sway to Present Findings

1. Press the Windows button, and then search to find Microsoft Sway.
2. Press Enter to launch Sway.
3. Tap **Create New**.
4. Tap **Insert**.
5. Tap **Upload**.
6. Tap the desired photo.
7. Tap **Open**.
8. Tap **Caption**.
9. Type **Caption 1**.
10. Tap **Insert**.
11. Tap **Upload**.
12. Tap the desired photo.
13. Tap **Open**.
14. Tap **Caption**.
15. Type **Caption 2**.
16. Tap the three parallel bars in upper left to launch menu.
17. Tap **My Sways**.
18. Tap to select an existing Sway.
19. Tap **Preview**.
20. Tap **Navigation**.
21. Tap to select alternate navigation layout.
22. Tap **Design**.
23. Tap to select an alternate style.

Time to complete steps: 92.13 sec

1. From the Home screen, tap to open Microsoft Sway.
2. Tap **Create**.
3. Tap **Media** to add a photo.
4. Tap the desired photo.
5. Tap **Text**.
6. Tap to place cursor in text box.
7. Type **Caption 1**.
8. Tap **Media** to add another photo.
9. Tap the desired photo.
10. Tap **Done**.
11. Tap **Text**.
12. Tap to place cursor in text box.
13. Type **Caption 1**.
14. Tap **My Sways**.
15. Scroll to locate desired presentation.
16. Tap to select and open desired presentation.
17. Tap **Preview**.
18. Tap **Edit**.
19. Tap **More**.
20. Tap **Grid** to change the navigation.
21. Tap **Done**.
22. Tap **Preview** to launch style menu.
23. Tap to select an alternate style.

Time to complete steps: 105.22 sec

DreamBox Learning®

1. In Edmodo, tap **Turn In**.
2. Tap to open the Word document
3. Tap on the URL in the Word document
<https://play.dreambox.com/login/t24z/dreambox1>.
4. Tap **Classroom**.
5. Tap **Student**.
6. Tap **Password**.
7. Tap **My Lessons**.
8. Tap **Equations, Tables, and Lines**.

Time to complete steps: 25.74 sec

1. From Home screen, tap to open the DreamBox® app.
2. Tap **Back** to enter school code.
3. Tap in box to enter school code.
4. Tap **Play**.
5. Tap **Classroom**.
6. Tap **User**.
7. Tap **Password**.
8. Tap **My Lessons**.
9. Tap **Equations, Tables, and Lines**.

Time to complete steps: 54.88 sec

Processor Results: Scenario 1: World-Population Scenario

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

Test	Microsoft® Surface™ 3 (in seconds)	Test	Apple® iPad® 2 (in seconds)
Edmodo® Learning Management System			
Open Edmodo in the Microsoft® Edge browser (clear the browser history).	1.90	Open the Edmodo app.	3.27
Total	1.90	Total	3.27

Processor Results: Scenario 1: World-Population Scenario

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

Edmodo Assignment

Open another tab in the Edge browser (Ctrl+T).	1.47	Tap Safari .	2.88
Navigate to Edmodo.	2.59	Navigate to Edmodo.	2.92
Once logged on to Edmodo, tap Turn In to find the world-population assignment (a Microsoft® Word document).	1.27	Once logged on to Edmodo, tap Turn In to find the world-population assignment (a Word document).	3.03
Open the Word document.	3.22	Open the Word document.	4.43
Open the Worldometers world-population link.	6.91	Open the Worldometers world-population link.	11.87
Median of three totals	14.88	Median of three totals	36.77

Annotate on Web Screen

Not Applicable (NA)	NA	Take a screenshot of current world-population data.	1.34
Open the Write on Web feature.	1.58	Open Evernote® Skitch app to annotate.	2.43
NA	NA	Select saved screenshot to annotate.	3.77
Total time for underline, highlight, circle, and strikethrough.	14.65	Total time for underline, highlight, circle, and strikethrough.	21.89
Add screenshot to Microsoft® OneNote®.	3.62	Add screenshot to OneNote.	11.88
Share screenshot with a collaborator via email.	4.14	Share screenshot with a collaborator via email.	11.10
Send email.	1.02	Attach a file to email, and send the email.	1.16
Median of three totals	25.16	Median of three totals	58.78

Transpose and Graph Data into Microsoft® Excel®

Open Excel.	2.73	Open Excel app.	8.83
		Tap Home button twice to switch back to Safari and locate Population Milestone data.	9.20
Launch split-screen functionality (using the Windows® key and the arrow keys) to display the website and Excel screens side by side.	3.26	No side-by-side functionality.	NA
Enter population milestone data into Excel.	28.90	Copy Population Milestone data from the website.	115.22
From Excel, tap Insert .	0.89	From Excel, tap Insert .	1.09
Tap Recommended Charts .	0.95	Tap Recommended Charts .	1.07
Tap Cluster Column .	0.96	Tap Cluster Column .	1.65
Median of three totals	36.64	Median of three totals	138.02

Adobe® Flash®

Open Edge browser.	2.53	Open Safari browser.	3.15
Navigate to http://www.nationalgeographic.com/earthpulse/population.html .	9.76	Navigate to http://www.nationalgeographic.com/earthpulse/population.html .	2.06
Tap the Human Impact tab to load Adobe Flash visual.	12.43	Does not support Flash	NA
Interact with the Flash visual.	3.02		
Median of three totals	27.73	Median of three totals	NA

Explore GeoGebra® Model

Open a new tab in Edge.	1.75	Open a new tab in Safari.	2.55
Navigate to http://tube.geogebra.org/student/m58931 .	3.08	Navigate to http://tube.geogebra.org/student/m58931 .	4.43
Tap and hold to select Natural Growth , and then select Animation On to put the model in motion.	2.77	Tap and hold variables, and then select Animation On to put the model in motion.	3.45
Median of three totals	7.72	Median of three totals	10.51

Use Microsoft® Sway to Present Learning

Open Microsoft Sway.	5.22	Open the Microsoft Sway app.	4.80
Create a new Sway.	8.49	Create a new Sway.	1.48
Preview the Sway.	1.07	Preview the Sway.	4.82
Change navigation.	2.98	Change navigation.	6.51
Change style.	2.21	Change style.	8.89
Median of three totals	22.84	Median of three totals	25.32

Processor Results: Scenario 1: World-Population Scenario

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

DreamBox Learning®

Open Edge and navigate to DreamBox®.	3.73	Open the DreamBox Learning app.	20.96
Connect with the classroom code.	1.28	Connect with the classroom code.	1.82
Run through the DreamBox sequence to open a classroom demo.	8.84	Run through the DreamBox sequence to open a classroom demo.	10.50
Load Tables, Equations, and Lines.	0.00	Load Tables, Equations, and Lines.	3.97
Median of three totals	14.45	Median of three totals	33.89

Scenario 2: The Compromise of 1850

Microsoft® Surface™ 3	Apple® iPad® 2
Internet Search for Primary Documents	
<ol style="list-style-type: none"> Press the Windows key, and then search to find the Microsoft® Edge browser. Press Enter. Tap to place cursor in the Search bar. Type Primary documents on the Compromise of 1850 to search for documents. Tap the first search result. 	<ol style="list-style-type: none"> From the Home screen, tap to open Safari®. Tap to place cursor in the Search bar. Type Primary documents on the Compromise of 1850 to search for documents. Tap Enter. Tap to select first search result.
Time to complete steps: 11.77 sec	Time to complete steps: 16.82 sec
Annotate Copy of Documents Found	
<ol style="list-style-type: none"> After completing the Internet Search for Primary Documents activity, tap on the pencil and paper icon in toolbar to launch the Write on Web feature. Tap the pen icon in upper left. Tap to circle a paragraph. Tap the hard disk icon to save note. Tap Send. Tap to View Note. 	<ol style="list-style-type: none"> After completing the Internet Search for Primary Documents activity, tap and hold on website text to launch the Copy/Paste menu. Tap and drag desired text. Tap Copy. Press the Home button. Tap to open Evernote® Skitch. Tap the plus sign to create a new note. Tap and hold to launch the Copy/Paste menu. Tap Paste. Place cursor in note title box. Type Primary Source Notes. Tap Save.
Time to complete steps: 15.60 sec	Time to complete steps: 30.95 sec

Scenario 2: The Compromise of 1850

Organize Research in Microsoft® OneNote®

1. Tap Windows® button to launch search.
2. Type **Henry Clay and Struggle for the Union video** into the **Search** bar.
3. Press Enter.
4. Drag the Edge window to the left, and then release it to launch split screen.
5. Tap to select and play a video in Bing®.
6. Tap to return to the desktop.
7. Tap on desktop shortcut to open Microsoft OneNote.
8. In OneNote, tap **View**.
9. Tap **Dock to Desktop**.
10. Tap to play a video in the Edge window.
11. Tap in OneNote, and then take notes in the OneNote window while watching the video file.

Time to complete steps: 51.10 sec

1. Press the **Home** button.
2. Tap to open the Safari browser.
3. Tap to place the cursor in the **Search** bar. Type **Henry Clay and Struggle for the Union video** into the YouTube™ **Search** bar.
4. Tap **Enter**.
5. Tap to select the video.
6. Tap **Open** to launch the YouTube app.
7. Tap **Play**.
8. Tap **Pause**.
9. Double-tap the **Home** button, and then swipe to locate the Microsoft OneNote app.
10. Tap to select the OneNote app.
11. Tap **Page** to create a new notes page.
12. Tap to place cursor in title box.
13. Type **Notes on Video**.
14. Tap in note-taking area.
15. Type a note about the video.
16. Double-tap the **Home** button, and then swipe to locate the YouTube app.
17. Tap to select the YouTube app.
18. Tap **Play**.

Time to complete steps: 66.55 sec

Share Information Between Microsoft OneNote Notebooks

1. In OneNote, tap to select the notebook page containing notes from the Internet research task.
2. Tap and hold on the page containing video notes, and then tap **Copy**.
3. Tap **File** to locate shared notebook.
4. Tap **Open**.
5. Tap the shared notebook, **Compromise of 1850_Shared Bibliography**.
6. Tap and hold on the page, and then tap **Copy**.

Time to complete steps: 6.75 sec

1. From the open OneNote app, tap to select the notebook page containing notes from the Internet research task.
2. Tap and hold on the desired text to launch the Copy/Paste menu.
3. Tap **Select All**.
4. In the upper left, tap the three parallel lines.
5. Tap **Open More**.
6. Tap to open the shared notebook, **Compromise of 1850_Shared Bibliography**.
7. Tap the plus sign to add a new page.
8. Tap and hold on the note-taking area, and then tap **Paste**.
9. Tap to place cursor on title box.
10. Type to enter title.

Time to complete steps: 38.22 sec

Scenario 2: The Compromise of 1850

Create Bibliography

<ol style="list-style-type: none"> 1. With OneNote still docked to desktop, tap the icon in the toolbar that launches Task Mode. 2. Tap to select previous Internet search results on the Compromise of 1850. 3. Using the track pad, tap to select desired text. 4. Press Ctrl+C to copy text. 5. Tap to launch split-screen view. 6. Tap a docked OneNote notebook on the right. 7. Press Ctrl+V to paste (the URL is copied alongside any copy/pasting activity in OneNote). 	<ol style="list-style-type: none"> 1. After completing the Internet Search for Primary Documents activity, tap and hold to launch the Copy/Paste menu. 2. Select text. 3. Tap Copy. 4. Double-tap the Home button, and then swipe to locate the Microsoft OneNote app. 5. Tap to select the notebook, Compromise of 1850_Shared Bibliography. 6. Tap and hold to launch the Copy/Paste menu. 7. Tap Paste. 8. Double-tap the Home button, and then swipe to Safari web results. 9. Tap to select Safari. 10. To copy the URL, tap and hold over the URL to select it. 11. Tap Copy. 12. Double-tap the Home button, and then swipe to locate the Microsoft OneNote app 13. Tap and hold on the desired notebook page to launch the Copy/Paste menu. 14. Tap Paste.
Time to complete steps: 14.56 sec	Time to complete steps: 36.00 sec

Use OneNote to Collaborate

<ol style="list-style-type: none"> 1. Still in OneNote, tap File. 2. Tap Share. 3. Tap to place cursor in text box 4. Type in two email addresses. 5. Tap Share. 	<ol style="list-style-type: none"> 1. In OneNote, tap the human head icon in the upper right to share the notebook. 2. Tap Invite People to Notebook. 3. Tap to place cursor in box. 4. Type in two email addresses. 5. Tap Send.
Time to complete steps: 22.02 sec	Time to complete steps: 26.66 sec

Record Video File in OneNote

<ol style="list-style-type: none"> 1. Still inside OneNote, tap Insert. 2. Tap Record Video to record a video file. 3. Record a 10-second file. 	Cannot add video files.
Time to complete steps: 15.17 sec	Time to complete steps: NA

Create Microsoft® PowerPoint® Presentation

<ol style="list-style-type: none"> 1. Press the Windows key, and then search for PowerPoint. 2. Press Enter. 3. Tap Blank Presentation to create a new presentation. 4. Tap to drag the PowerPoint window to the right to launch split-screen with the already opened Microsoft OneNote. 5. Using the track pad, tap to select desired text in OneNote. 6. Press Ctrl+C to copy text. 7. Press Ctrl+V to paste text into PowerPoint. 	<ol style="list-style-type: none"> 1. From the Home screen, tap to open PowerPoint. 2. Tap Blank Presentation. 3. Double-tap the Home button, and then swipe to locate the Microsoft OneNote app. 4. Tap to open OneNote. 5. Tap to place cursor by desired text. 6. Tap and hold to launch the Copy/Paste menu. 7. Select text. 8. Tap Copy. 9. Double-tap the Home button, and then swipe to locate the PowerPoint app. 10. Tap to open PowerPoint. 11. Tap to select where text should go. 12. Tap Paste.
Time to complete steps: 14.58 sec	Time to complete steps: 33.65 sec

Scenario 2: The Compromise of 1850

Create a Quiz

1. Still inside PowerPoint, tap Mix .	1. Tap to launch Safari.
2. Tap Quizzes Video Apps .	2. Tap to place the cursor in the Search bar.
3. Select Multiple Choice Quiz .	3. Type create.kahoot.it .
4. Tap Insert .	4. Tap to place cursor in email box.
5. Tap to place cursor in question box.	5. Type email.
6. Type Was California admitted as a free state? Yes or No .	6. Tap or tab to place cursor in password box.
7. Press Tab to place cursor in first answer box.	7. Enter password.
8. Enter Yes .	8. Tap Enter .
9. Press Tab button to place cursor in second answer box.	9. Tap Quiz .
10. Type No .	10. Tap to place cursor in Quiz Name box.
11. Tap Preview .	11. Type to Name Quiz .
12. Tap Submit .	12. Tap Go .
	13. Tap to place cursor in question title box.
	14. Type Was California admitted as a free state?
	15. Tap in Answer 1 box.
	16. Tap Yes .
	17. Tap Correct .
	18. Tap in Answer 2 box.
	19. Type No .
	20. Tap Save & continue .

Time to complete steps: 36.87 sec

Time to complete steps: 54.22 sec

Processor Results: Scenario 2: Compromise of 1850

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

Test	Microsoft® Surface™ 3 (in seconds)	Test	Apple® iPad® 2 (in seconds)
Internet Search for Primary Documents			
Open the Microsoft® Edge browser.	2.44	Open the Safari® browser.	3.13
Type Primary documents on the Compromise of 1850 to search for documents.	6.88	Type Primary documents on the Compromise of 1850 to search for documents.	10.85
Tap the first search result.	1.48	Tap the first search result.	2.51
Median of three totals	10.65	Median of three totals	16.55
Annotate Copy of Documents Found			
After completing the Internet Search for Primary Documents activity, select the Write on Web feature .	1.08	After completing the Internet Search for Primary Documents activity, tap to select a paragraph, and then copy the paragraph.	6.14
Circle one paragraph.	3.02	Tap to open Evernote® Skitch.	8.83
Select Save Note .	0.88	Create a new note.	1.96
Tap Send .	1.67	Paste the previously copied paragraph.	2.51
Tap View Note .	2.31		
Median of three totals	9.15	Median of three totals	18.58

Processor Results: Scenario 2: Compromise of 1850

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

Test	Microsoft® Surface™ 3 (in seconds)	Test	Apple® iPad® 2 (in seconds)
Organize Research in Microsoft® OneNote®			
Search for Henry Clay and the Struggle for the Union on YouTube™ using the Edge browser.	7.35	Search for Henry Clay and the Struggle for the Union on YouTube using the Safari browser.	15.91
Tap to select the video from the search results.	4.44	Tap to select the video from search results.	10.67
Tap to start the video.	3.89	Tap to start the video.	12.63
Swipe left to dock the web page, press the Windows® key, and then open OneNote in split-screen view.	2.07	Tap to open the OneNote app.	12.31
Select View .	1.07		
Select Dock to Desktop .	1.07		
Take notes in the OneNote while watching the video file.	177.55	Tap back and forth between applications to take notes (this will include pausing video).	252.10
Median of three totals	197.41	Median of three totals	306.98
Create Bibliography			
From the open OneNote notebook, locate and open the shared notebook, Compromise of 1850_Shared Bibliography .	4.58	From the open OneNote app, tap and hold to select text, and then tap Select .	4.22
From the student notebook, copy and paste information into the shared notebook to create a bibliography.	13.50	Locate and open the shared notebook Compromise of 1850_Shared Bibliography .	4.02
		From the student's individual OneNote notebook, copy and paste information into the shared OneNote notebook to create a bibliography.	8.27
Median of three totals	18.08	Median of three totals	16.48
Use Microsoft OneNote to Collaborate			
In OneNote, tap File .	1.39	In OneNote, from the upper right, tap the Share Notebook icon.	0.91
Find Compromise of 1820_Shared Bibliography , and then tap Settings .	0.61	Tap Invite People to Notebook .	0.73
Tap Share .	1.04	Tap to add two email addresses.	14.22
Tap to add two email addresses.	8.03	Tap Send .	1.72
Tap Share .	4.22	Tap Shared With to confirm.	5.24
Median of three totals	15.18	Median of three totals	22.86
Record Video File			
Tap Insert .	0.44	Tap Insert .	0.71
Tap to record a video file.	2.33	Tap to record a video file.	1.01
Record a 10-second file.	13.47	Record a 10-second file.	11.56
Median of three totals	16.01	Median of three totals	13.39
Create Microsoft® PowerPoint® Presentation			
Open PowerPoint.	7.03	Open PowerPoint.	12.84
Open OneNote.	2.13	Open OneNote.	1.44
Tap the Windows key plus the right arrow key to launch split-screen view and select PowerPoint as the other split.	2.16		
Copy sample text from OneNote.	2.54	Copy sample text from OneNote.	6.42
Paste sample text from OneNote into PowerPoint.	2.52	Paste sample text from OneNote into PowerPoint.	17.14
Median of three totals	15.60	Median of three totals	38.19

Processor Results: Scenario 2: Compromise of 1850

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

Create a Quiz

Open PowerPoint.	3.70	Tap to launch Safari.	3.86
Tap Mix .	0.66	Navigate to create.kahoot.it.	6.93
Tap Quizzes Video Apps .	2.38	Log on.	17.72
Select Multiple Choice Quiz .	4.63	Tap to create a new quiz.	1.93
		Type The 5 components of the Compromise of 1850 .	15.36
Add one question, Was California admitted as a free state? Yes or No , and set the answer to Yes . Tap Save and Continue .	17.13	Add one question, Was California admitted as a free state? Yes or No , and set the answer to Yes . Tap Save and Continue .	22.66
Median of three totals	28.81	Median of three totals	80.10
Totals			
Middle-school scenario total	151.31	Middle-school scenario total	312.32
High-school scenario total	310.89	High-school scenario total	513.13
Total of middle-school and high-school tests together	462.20	Total of middle-school and high-school tests together	825.45

Scenario 3: Lesson Planning: Persuasive-Writing Unit

Microsoft® Surface™ Pro 4

Apple® iPad Pro™

Save Internet Research to OneNote

<ol style="list-style-type: none"> 1. Tap the Windows® key to launch search. 2. Type Common core persuasive writing in the Search bar. 3. Tap Enter. 4. Locate the result: http://commoncore.scholastic.com/answers/how-do-i-teach-persuasive-writing, and then tap to launch in the Edge browser. 5. In Edge, tap the Share icon. 6. Tap to select OneNote. 7. Select the OneNote location to send clipping to, and then tap Send. 	<ol style="list-style-type: none"> 1. With iTunes U® open, swipe from left to initiate side-view split screen. 2. In sidebar view, scroll to locate Safari®. 3. Tap to launch Safari. 4. Tap to place the cursor in the Search bar. 5. Type Common core persuasive writing. 6. Tap to select result. 7. Tap on the result http://commoncore.scholastic.com/answers/how-do-i-teach-persuasive-writing. 8. Tap and hold to launch the Copy/Paste menu. 9. Tap and drag to select text. 10. Tap Copy. 11. Tap to edit inside iTunes U. 12. Tap Add a New Page. 13. Tap in a content box. 14. Tap Paste. 15. Tap to place cursor in title menu. 16. Type a title. 17. Tap Done.
Time to complete steps: 24.50 sec	Time to complete steps: 45.19 sec

Scenario 3: Lesson Planning: Persuasive-Writing Unit

Research and Take Notes on Examples of Persuasive Writing

1. Press the Windows key, type in **Newsela**, and then press Enter.
2. Tap **Newsela** in the Bing® search result.
3. Tap to select relevant article.
4. Tap the **Write-on-Web** icon.
5. Tap the **Pen** icon
6. Tap and drag to circle the headline.
7. Tap the **Highlighter** icon.
8. Tap and drag to highlight text.
9. Tap the **Pen** icon again.
10. Tap and drag to draw one arrow.
11. From the upper right, tap the **Save** icon.
12. Tap the drop-down menu to select a section.
13. Tap notebook to send the annotation to.
14. Tap **Send**.
15. Tap **View Notes**.

1. From the Home screen, tap Safari.
2. Tap to place the cursor in the **Search** bar.
3. Type **Newsela**.
4. Tap **Go**.
5. Tap to select **Newsela** in the search result.
6. Tap an article.
7. Tap in the upper right to **Share**.
8. In share menu, tap to scroll for the Evernote® Skitch app.
9. Tap to select Evernote.
10. From the upper right, tap **Snap**.
11. Tap the **Tool** icon.
12. Tap the arrow icon.
13. Tap the snapped webpage to insert arrow.
14. Tap the arrow tool to launch more annotating options.
15. Tap the highlighter icon.
16. Tap to highlight text.
17. Tap **Save**.
18. Double-tap the **Home** button.
19. Scroll to locate the Skitch app.
20. Tap to select the Skitch app.
21. Tap **Camera Roll**.
22. Tap to select saved screenshot.
23. Tap the **Share** icon.
24. Tap **Other App**.
25. Tap **OneNote**.
26. Tap **Location**.
27. Tap **Persuasive Writing Unit** notebook.
28. Tap **Notes** (select page desired).
29. Tap **Send**.

Time to complete steps: 35.77 sec

Time to complete steps: 73.36 sec

Locate Existing Microsoft® Word Doc

1. From desktop, tap the folder icon in the task bar.
2. Tap to select Microsoft® OneDrive®.
3. Locate and tap the folder.
4. Tap to select and open the Microsoft Word document.

1. From the Home screen, tap to open the App Store®.
2. Tap to place the cursor in the **Search** bar.
3. Type **OneDrive**.
4. Tap **Install** to download the OneDrive app.
5. Tap **Open** to launch OneDrive.
6. Tap to place the cursor in the user prompt.
7. Type **User Email**.
8. Tap **Enter**.
9. Tap to place the cursor in the password prompt.
10. Type the account password.
11. Tap **Folder**.
12. Tap on Microsoft Word document.
13. Tap **Open**.

Time to complete steps: 4.58 sec

Time to complete steps: 95.44 sec
(or 11.19 sec if OneDrive is already downloaded; in this case, steps 1–4 are omitted)

Scenario 3: Lesson Planning: Persuasive-Writing Unit

Add a Word Doc to Course Materials

1. With the Word document still open, tap **Review**.
2. Tap **Linked Notes**.
3. Tap to select the OneNote notebook to link the document to.
4. Tap **OK**.

1. From inside Microsoft Word, tap **Share**.
2. Tap **Copy Link**.
3. Tap **View Only** or **View and Edit**.
4. Double-tap the **Home** button.
5. Scroll to locate iTunes U.
6. Tap to open iTunes U.
7. In **My Courses**, select **Course: Persuasive Writing Unit**.
8. Tap **Materials**.
9. Tap **+** to add materials.
10. Tap **iTunes or Web Link**. Copied link populates automatically in selection.
11. Tap **Enter**.
12. Tap **Add**.

Time to complete steps: 18.28 sec

Time to complete steps: 27.39 sec

Add YouTube™ Video to Course Materials

1. Press the Windows key, type **I have a dream speech YouTube**.
2. Tap to select the result in Bing.
3. Tap on URL to copy the video link in Edge.
4. Tap **Copy**.
5. Drag window to middle and then left to innate split screen.
6. Tap to Open OneNote in right.
7. Tap **Insert**.
8. Tap **Online Video**.
9. Tap to place the cursor in the dialog box.
10. Using the keyboard, press Ctrl+V to paste the URL.
11. Tap **OK**.

1. From the Home screen, tap to open Safari.
2. Tap to place the cursor in the **Search** bar.
3. Type **I have a dream speech YouTube**.
4. Tap to open the link in the search results.
5. Tap **OK** to open in the YouTube app.
6. Tap the **Share** arrow.
7. Tap to place the cursor by the URL.
8. Slide to select the entire URL.
9. Tap **Copy**.
10. Slide from left to launch side-view mode.
11. Scroll to locate OneNote.
12. Tap to open OneNote.
13. Tap to select **Persuasive Writing Unit**.
14. Tap and hold to launch the Copy/Paste menu.
15. Tap **Paste**.

Time to complete steps: 20.25 sec

Time to complete steps: 23.74 sec

Collaborate with Department

1. Press the Windows key, and then type **OneNote**.
2. Tap **File**.
3. Tap **Share**.
4. Tap to place the cursor in the email box, and then type the email address.
5. Tap **Share**.

1. From the Home screen, tap to open the iTunes U app.
2. Tap **My Courses**.
3. Tap **Persuasive Unit**.
4. From the bottom, tap **Admin**.
5. Tap **Instructors**.
6. Tap **Add a Contributor**.
7. Tap to place the cursor in the recipient-info prompt (must be Apple ID).
8. Tap **Send**.
9. Tap **Done** to exit the menu.

Time to complete steps: 37.45 sec

Time to complete steps: 86.64 sec

Processor Results. Scenario 3: Teacher Lesson Planning

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

Test	Microsoft® Surface™ Pro 4 (in seconds)	Test	Apple® iPad Pro™
Choose a Platform: Microsoft® OneNote® Versus iTunes U®			
Open OneNote.	2.05	Open iTunes U app.	1.33
Create new OneNote notebook.	6.03	Launch menu to create a new course.	1.92
Open existing OneNote notebook from cloud service.	0.85	Open existing course to edit.	0.89
Median of three totals	8.93	Median of three totals	4.14
Choose a Platform: Microsoft OneNote Versus Microsoft OneNote App for Apple® iPad®			
Open OneNote.	2.05	Open OneNote app.	1.69
Create new OneNote notebook.	6.03	Create new OneNote notebook.	6.75
Open existing OneNote notebook from cloud service.	0.85	Open existing OneNote notebook from cloud service.	0.82
Median of three totals	8.80	Median of three totals	9.37
Save Internet Research to OneNote			
With OneNote open, drag the window to the left to split the screen.	1.65	With iTunes U open, drag the window to left to view the left sidebar (simultaneous split screen is not possible on this device).	2.69
Tap the Windows® key, search for Common core persuasive writing , and then display search results in Bing®.	1.50	Tap the Safari® app, type Common core persuasive writing , and then display search results.	1.36
Tap the search result http://commoncore.scholastic.com/answers/how-do-i-teach-persuasive-writing .	1.08	Tap the search result http://commoncore.scholastic.com/answers/how-do-i-teach-persuasive-writing .	2.08
Median of three totals	4.20	Median of three totals	6.68
Research to Find Examples of Persuasive Writing and Annotate Results			
In the open Microsoft® Edge browser, type to find the Newsela website.	1.87	From Safari, type to find the Newsela website.	3.69
Open Make a Web Note .	1.11	Open the Evernote® Skitch app.	1.26
Annotate page by circling the headline.	0.88	Annotate the page with Evernote Skitch (time for Evernote Skitch to capture the website).	2.29
Send the annotated page to OneNote.	1.89	Send the annotated Evernote Skitch page to OneNote.	3.22
Median of three totals	5.73	Median of three totals	10.43
Locate Existing Microsoft Word Doc			
Open Microsoft® OneDrive® via desktop file manager.	0.99	Open the OneDrive app.	1.99
		Enter user name and password.	4.35
Open folder containing document.	0.76	Open folder containing document.	1.01
Open desired Microsoft Word document.	1.70	Open desired Microsoft Word document.	7.36
Median of three totals	3.38	Median of three totals	16.08

Processor Results. Scenario 3: Teacher Lesson Planning

Note: Each number represents the median results of three timed tests. Totals should not be read as the sum of the numbers listed but as the median total of three timed tests.

Add a Microsoft® Word Document to the Course Materials			
Launch Word.	1.65	Launch the OneDrive app.	1.46
Open a Word document.	1.76	Navigate to the desired document.	1.02
Tap the Review tab.	1.34	Tap the document to select.	1.01
Add to OneNote by tapping Linked Notes .	1.01	From the bottom right, tap the three-dot icon.	0.61
		Tap Open in Other App .	1.07
		Tap Copy to iTunes U .	2.62
		Select Course: Seattle History .	0.44
		Add to course materials.	0.69
Median of three totals	5.86	Median of three totals	8.96
Add YouTube™ Video to Course Material			
Open the Edge browser.	1.13	Open the Safari browser.	1.27
Search for OneNote in Education YouTube .	0.83	Search for OneNote in Education YouTube .	1.35
Open the link for the first video.	1.57	Open the link for the first video.	3.17
Copy the video link in Edge.	1.34	Tap the Share arrow.	0.62
		Tap Copy Link .	0.53
Open OneNote.	1.42	Open the OneNote app.	3.53
Tap Insert .	0.43	Tap Insert .	2.02
Tap Online Video .	0.70		
Paste the video link, and then press Enter.	0.75	Tap and hold the Address Line to bring up copy/paste options, and then tap Paste .	1.72
Median of three totals	8.20	Median of three totals	14.19
Collaborate with Department			
Open OneNote.	1.53	Tap to open iTunes U.	1.10
Tap File .	0.87	Tap My Courses .	0.55
Find the specific OneNote notebook to share, and then tap Settings .	0.48	Select a course.	1.01
Tap Share or Move .	0.92	Tap Admin , tap Instructors , then add Contributor .	2.68
		Tap Mail .	0.71
Add one email address of a coworker, and then tap Share .	3.85	Add one email address, and then tap Send .	1.30
Median of three totals	6.45	Median of three totals	7.40
Total teacher scenario	42.65	Total teacher scenario	109.87

¹ Estimates based on National Center for Education Statistics, which shows that the average class time per day in U.S. schools is 6.64 hours and the average number of school days per year as 180. "Schools and Staffing Survey." https://nces.ed.gov/surveys/sass/tables/sass0708_035_s1s.asp.

² Bill & Melinda Gates Foundation. "Teachers Know Best: What Educators Want from Digital Instructional Tools." 2014. http://collegeready.gatesfoundation.org/wp-content/uploads/2015/04/Teachers-Know-Best_0.pdf.

³ Percent calculated from combined times for both classroom scenarios that we tested. For full details and test results, see Appendix B.

⁴ Estimates based on 180-day school year over a three-year device life cycle. We paid \$418 for the Apple® iPad® 2 and keyboard on amazon.com® and \$565 for the Microsoft® Surface™ 3 and keyboard from the Microsoft® Store, with a 10 percent education discount.

⁵ Scholastic Inc. and the Bill & Melinda Gates Foundation. "Primary Sources: America's Teachers on Teaching in an Era of Change." 2014. <http://www.scholastic.com/primarysources/download-the-full-report.htm>.

⁶ All character names throughout this paper represent fictional characters.

⁷ The new Apple Pencil™ does not work for annotating web pages, but does work for Microsoft® OneNote®.

⁸ Devices purchased with a 10 percent education discount. Prices taken from the Microsoft® Store and amazon.com®.



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