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APPLE'S NEW
MACBOOK PRO

WHY THERE'S PLENTY TO GET KEYED UP ABOUT

iPHONE SE
APPLE'S LOW-COST HANDSET GETS EVEN BETTER

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'Speaking up on racism' letter issued by Tim Cook

Cook's statement is linked prominently from the front page of Apple.com. **Jason Cross** reports

Apple CEO Tim Cook has released an open letter to address the current unrest due to the killing of George Floyd. A link to the letter, titled 'Speaking up on racism', has been added to the Apple.com home page – see **fave.co/3f6Mc1y**.

The letter acknowledges the "senseless killing of George Floyd" but is primarily concerned with the longer history of racism and the way it is, in Cook's words, "still present today – not only in the form of violence, but in the everyday experience of deeply rooted discrimination".

Cook's statement comes on the heels of many such letters from corporate brands and their leaders. Compared to most of them, the statement from the CEO of the most valuable company in the US is modest (it certainly lacks the verve and specific calls to action of the statement from Ben and Jerry's, for example). It acknowledges both the current firestorm and the larger systemic issue, while mentioning donations to "organizations like the Equal Justice Initiative".

But Cook doesn't call out any particular people or organizations by name, save for mentioning George Floyd and the donations to the Equal Justice Initiative. It does not call for any particular legislative or policy changes, nor does it commit Apple to any specific action to which it could be held accountable other than making monetary donations.

Rather, Cook offers the following rather vague corporate commitments: "But we must do more. We commit to continuing our work to bring critical resources and technology to underserved school systems. We commit to continuing to fight the forces of environmental injustice – like climate change – which disproportionately harm Black communities and other communities of colour. We commit to looking inward and pushing progress forward on inclusion and diversity, so that every great idea can be heard. And we're donating to organizations including the Equal Justice Initiative, which challenge racial injustice and mass incarceration."

The letter closes with a quote from Martin Luther King: "Every society has its protectors of status quo and its fraternities of the indifferent who are notorious for sleeping through revolutions. Today, our very survival depends on our ability to stay awake, to adjust to new ideas, to remain vigilant and to face the challenge of change."

Apple releases important security patches for all its operating systems

The update is recommended for all users. **Jason Cross** reports
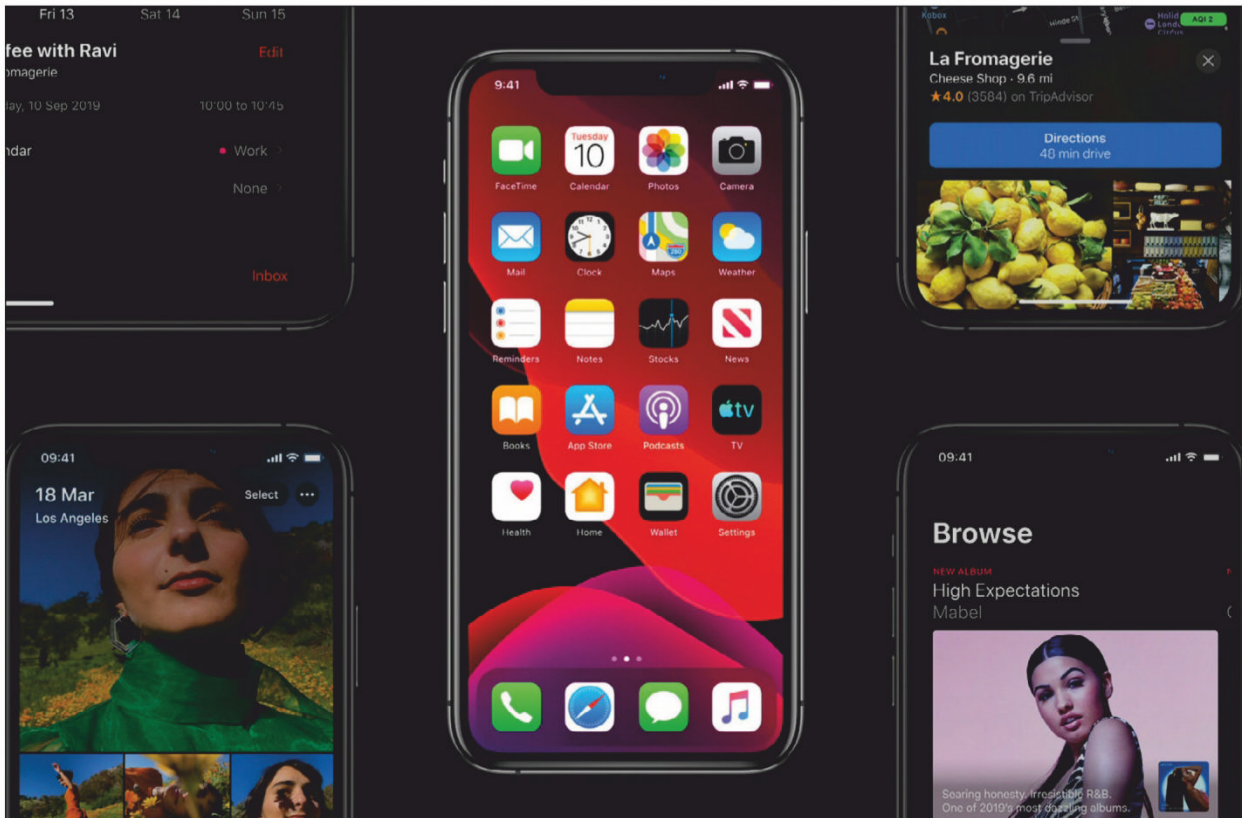
Apple has released a small but important update to all its operating systems. The notes for version iOS and iPadOS 13.5.1, watchOS 6.2.6, tvOS 13.4.6 and macOS 10.15.5 are practically non-existent: "This update provides important security updates and is

recommended for all users." The iOS update also includes 13.4.6 for HomePod.

Typically, when Apple is so vague about a security patch, it is trying to make sure users have a change to update without tipping off hackers. This latest patch is probably related to a new jailbreaking tool that apparently works even on newer hardware running iOS 13.5.

We can get a little more information by looking at Apple's security updates page. The security update details for all these operating systems is exactly the same: "Arbitrary code with kernel privileges" is really bad. Yes, that's one component necessary to jailbreak iPhones and iPads, but it's also a major security issue for malicious hackers, and an open window for the devices law enforcement and government agencies use to access the data on personal devices (with or without a warrant).

In short, you should take Apple's word that this is "recommended for all users" seriously and update your iPhone, iPad, Mac, Apple TV, HomePod or Apple Watch.

Low-cost iPads with bigger screens and faster chips could be on the way

Analyst Ming-Chi Kuo says Apple working on a 10.8in iPad and a 9in iPad mini with faster processors. **Michael Simon** reports

Hot on the heels of the launch of the new iPad Pro and Magic keyboard, Apple is reportedly readying new iPads models at the low-end of the spectrum as well.

A report by oft-accurate analyst Ming-Chi Kup of TFT Securities says Apple will be launching two new sizes of iPad later this year: a 10.8in iPad and an

8.5-to-9in iPad mini. Both of those sizes are bigger than Apple's current line-up, which includes the 10.2in iPad, 10.5in iPad Air, and 7.9in iPad mini.

Kuo says the iPads "will follow iPhone SE's product strategy, and selling points will be the affordable price tag and the adoption of fast chips". The iPad Air and iPad mini both use Apple's A12 Bionic chip, while the 10.2in iPad is powered by the older A10 Fusion. A release in the second half of 2020 would likely mean the new iPads will use the A13 Bionic in the iPhone 11 and the iPhone SE.

It's unclear from Kuo's report whether Apple will be consolidating the low-end iPad line, but it certainly seems so. As it stands, Apple sells the 10.2in iPad for £349 and the 10.5in iPad Air for £479, with the latter models bringing more speed and a better screen. If the new 10.8in model replaces the 10.2in one, the 10.5in iPad Air has little reason to exist.

However, a rumour from Twitter leaker @l0vetodream, who previously predicted the timing of the iPhone SE and iPad Pro releases, said a new 10.2in model is coming this year powered by an A12 chip. Previous rumours pointed to mini-LED displays in the iPad and iPad mini, but Kuo doesn't mention the display tech in his report.

In the same report, Kuo says Apple's AR-powered glasses project isn't expected to arrive until 2022.

Report: Apple to beef up Apple TV+ catalogue with licensed content

The 'originals only' approach is apparently not enough in a highly competitive market. **Jason Cross** reports

A new report from Bloomberg claims Apple is changing up its strategy for the Apple TV+ streaming service. Until now, Apple has pitched the service as only for original content you can't find anywhere else. Now, according to the report, it will bolster its original series and movies with a bit of licensed content.

On , you can see a six-month check-in with the service, which launched on November 1, 2019. After watching nearly everything Apple TV+ offers, we concluded that the overall quality is fine, and the price is competitive (£4.99 per month and a year free with most new Apple device purchases), but the volume of content makes it hard to justify.

Competitors, from Netflix to Amazon to Disney+, make their name on original content but add value with tens of thousands of hours of licensed content.

The report cites "people familiar with the matter" and states that Apple has taken pitches from Hollywood studios about licensing older content. The company has bought some shows and movies, but don't expect a massive catalogue of hits. The report clarifies that Apple TV+ will remain focused on original shows and movies, and that Apple has not yet licensed any "huge franchises or blockbusters".

The report does not state when Apple would add its licensed content to the service, but it does say that Apple TV+ had about 10 million subscribers in January, only about half of which were active users. This puts it miles behind rivals such as Netflix and Disney+.

Apple granted patent for virtual group selfies

The patent, filed in 2018, may be just the thing for a pandemic-stricken world. **Jason Cross** reports

Apple has been granted a patent by the USPTO for "generating synthetic group selfies". A patent is not a product, but if the software worked as described therein, it would allow multiple users who are not physically near each other to each take a photo with their own devices and have them combined into a single group selfie.

According to the patent, the group selfie would be an artificial composition of individual selfies, and

the individual selfies can be "still images, stored video images, or live streaming images".
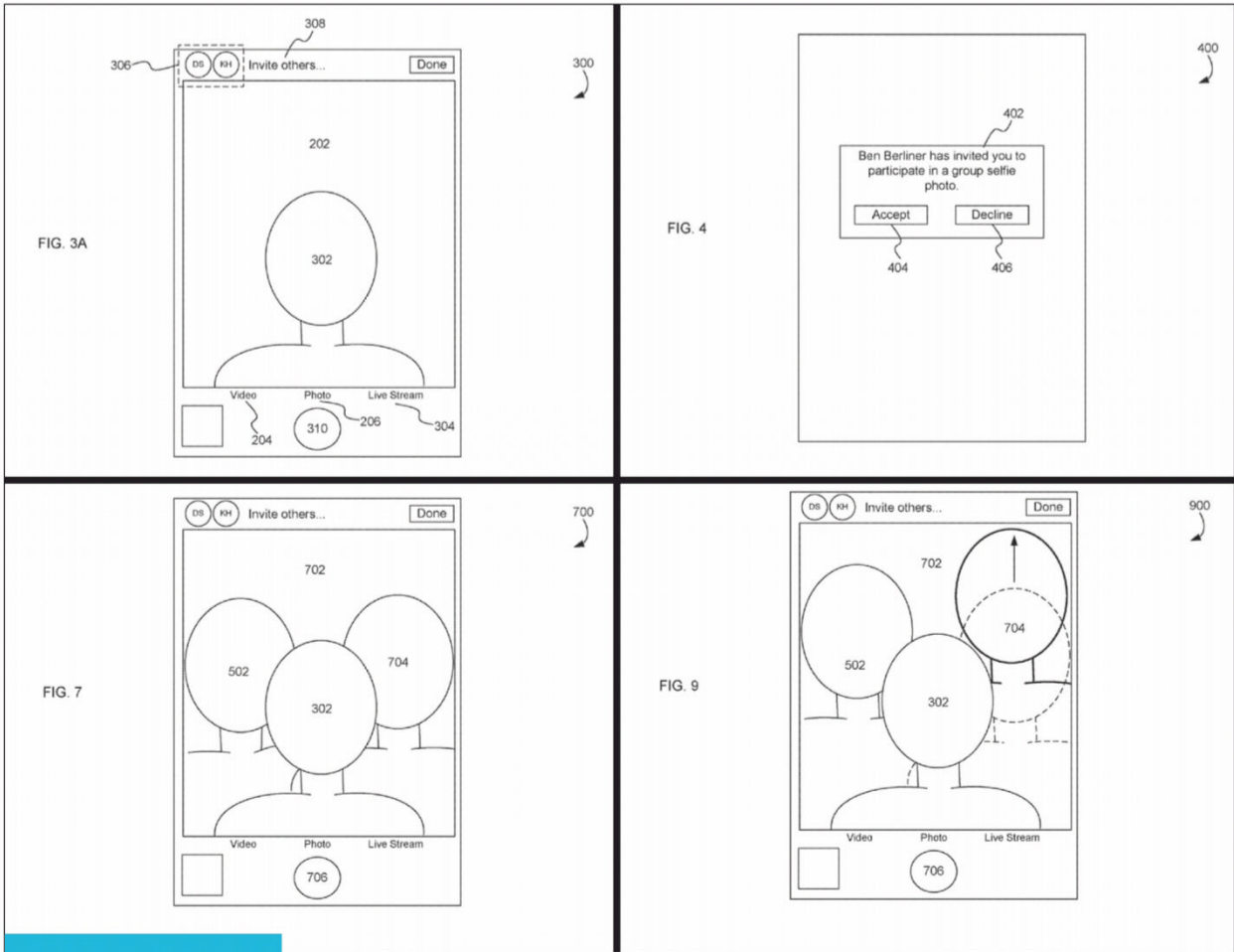
As most patents are, it is written to be slightly vague and broad – a patent needs to be specific in order to be granted, but companies want them to cover as much potential ground as possible. It describes what this group selfie feature might look like, in "one possible implementation."

A user opens up a photo-taking app and enters into a group selfie mode. They then invite other users, who get a prompt on their device to participate. Everyone would then take a new selfie with their own device, or maybe choose a previously-taken one.

Then the system would combine them into a single composite shot while saving all the information separately so users could do things like adjust the layout or position of the people.

It sounds like a feature tailor-made for a global pandemic where everyone is trying to stay socially distant, but the technology was not imagined with COVID-19 in mind: Apple first applied for the patent in July of 2018. It's also the sort of thing that requires a lot of sophistication to implement well. It would be relatively easy to just mask out people and arrange them together, but much harder to make the images look like they fit together, artificially adjusting white balance and lighting to make it look convincingly like the subjects were all actually in the same shot.

As always, we should note that Apple applying for or receiving a patent does not necessarily mean

FIG. 3A — 308 · 306 (DS KH) Invite others... · Done · 300 · 202 · 302 · Video · Photo · Live Stream · 204 · 310 · 206 · 304

FIG. 4 — 400 · 402 · Ben Berliner has invited you to participate in a group selfie photo. · Accept · Decline · 404 · 406

FIG. 7 — (DS KH) Invite others... · Done · 700 · 702 · 502 · 704 · 302 · Video · Photo · Live Stream · 706

FIG. 9 — (DS KH) Invite others... · Done · 900 · 702 · 704 · 502 · 302 · Video · Photo · Live Stream · 706

Apple's patent

this technology will ever see the light of day. Large technology companies like Apple frequently apply for patents that never make it into final products as a part of their regular ongoing research and development efforts.

13in MacBook Pro (mid-2020)

RATING: ★★★★☆

Price: **£1,799 (inc VAT)** from **fave.co/2UsF7jZ**

We hoped that when the 16in MacBook Pro was released, an upgrade to the 13in MacBook Pro would shortly follow. But it didn't. Then Apple upgraded the MacBook Air, and then we thought that surely a new 13in MacBook Pro was imminent.

Over a month after the MacBook Air update, the much-anticipated new 13in MacBook Pro finally dropped. The new models feature new CPUs, faster

RAM and new GPUs to boost its speed, and the new Magic Keyboard will bring back customers who decided to stay away from the version of the laptop with a butterfly keyboard.

If you currently have a high-end 13in MacBook Pro that you bought within the past four years, you might consider sticking with that laptop a little while longer. While you'll see nice speed gains with the new MacBook Pro, it may be hard to justify the cost right now. Unless you really, really want to get rid of the laptop because of the butterfly keyboard and replace a painful typing experience for a more pleasant one.

This review takes a look at the £1,799 standard configuration of the 13in MacBook Pro, which has a 2GHz quad-core Core i5 processor, 16GB of memory, Intel Iris Pro Graphics and a 512GB SSD. The £1,999 model is the same except with a 1TB SSD. Apple's £1,299 and £1,499 versions have the same eighth-generation 1.4GHz quad-core Core i5 processors as they did when they were released last year, but they now have the Magic Keyboard and double the SSD capacity.

RIP, butterfly keyboard

With the release of the 16in MacBook Pro back in November of 2019, Apple started phasing out its much-maligned butterfly-mechanism keyboard in favour of its new Magic Keyboard, which uses a scissor-switch mechanism. The MacBook Air followed suit when it was updated in March 2020, leaving the 13in MacBook Pro as the only

laptop left with the butterfly keyboard. With this update, the butterfly keyboard farewell tour is now complete. It's now completely gone from Apple's laptop line-up and it won't be missed (though Apple does insist that the butterfly keyboard had its fans). Our preference for the new Magic Keyboard was documented in our reviews of the 16in MacBook Pro and the latest MacBook Air, and the implementation in the 13in MacBook Pro just reinforces what we like about it.

The butterfly keyboard was hard on the fingers, loud, and so unreliable that Apple had to start a Keyboard Service Programme for it. The new

Goodbye, butterfly keyboard. Hello, Magic Keyboard, as well as dedicated ESC and Touch ID keys along the sides of the Touch Bar, and half-height arrow keys

Magic Keyboard is much easier on the fingers and the ears – it has a softer, more comfortable feel and isn't as noisy. Time will tell in regard to its reliability, but we haven't had problems with this laptop, the 16in MacBook Pro and the new MacBook Air so far. That's a good sign.

Apple's Touch Bar is alive and well on the 13in MacBook Pro. For the unfamiliar, the Touch Bar is a touchscreen strip at the top of the keyboard, replacing the Function keys you might be used to seeing. The keys that appear on the Touch Bar depend on the app you're using. For example, if you are in Maps, buttons can appear for getting directions, searching for a location, marking a location as a favourite, and more.

The Touch Bar can be a useful way to use your Mac, but after years of using Touch Bar-equipped laptops (Touch Bar was introduced in 2016), I still can't get myself to use it on a regular basis. The Touch Bar can be customized for your use, so it doesn't always have to display app-based options, but even with that I can't develop a habit of using it. I hesitate to say it's unnecessary, because I don't think it's poorly implemented. I just can't get myself to remember that it's there to use for more than just F-key functions.

Faster CPU and memory, boosted graphics

The new £1,799 and £1,999 13in MacBook Pros feature 10th-generation Intel Core processors, and they replace eight-generation processors in their predecessors. They both have a 2GHz quad-core

Core i5 CPU with Turbo Boost up to 3.8GHz and 6MB L3 cache. The previous processor was a 2.4GHz quad-core Core i5, but the new processor is based on Intel's Ice Lake microarchitecture that provides better performance, so the older CPU's higher clock speed doesn't mean much. For an additional £200, you can upgrade to a 2.3GHz quad-core Core i7 processor, which has Turbo Boost up to 4.1GHz.

Apple also provides faster memory in the new 13in MacBook Pro. The 2,133MHz LPDDR3 RAM in the previous laptop has been upgraded to 3,733MHz LPDDR4X, which should help boost performance. Standard configurations now start at 16GB of memory; it used to be 8GB. And Apple now offers a 32GB upgrade, which is an extra £400.

Pro users should especially take note of the Intel Iris Plus Graphics in the new laptop. You can now connect one 6K display (which you couldn't do before), such as Apple's Pro Display XDR or one 5K display. Or you can connect up to two 4K displays. It's still an integrated GPU, and it shares its graphics memory with the Mac's main memory. According to Apple, the Iris Plus has 33 percent more execution units than its predecessor (64 instead of 48), so you should see a noticeable graphics performance improvement.
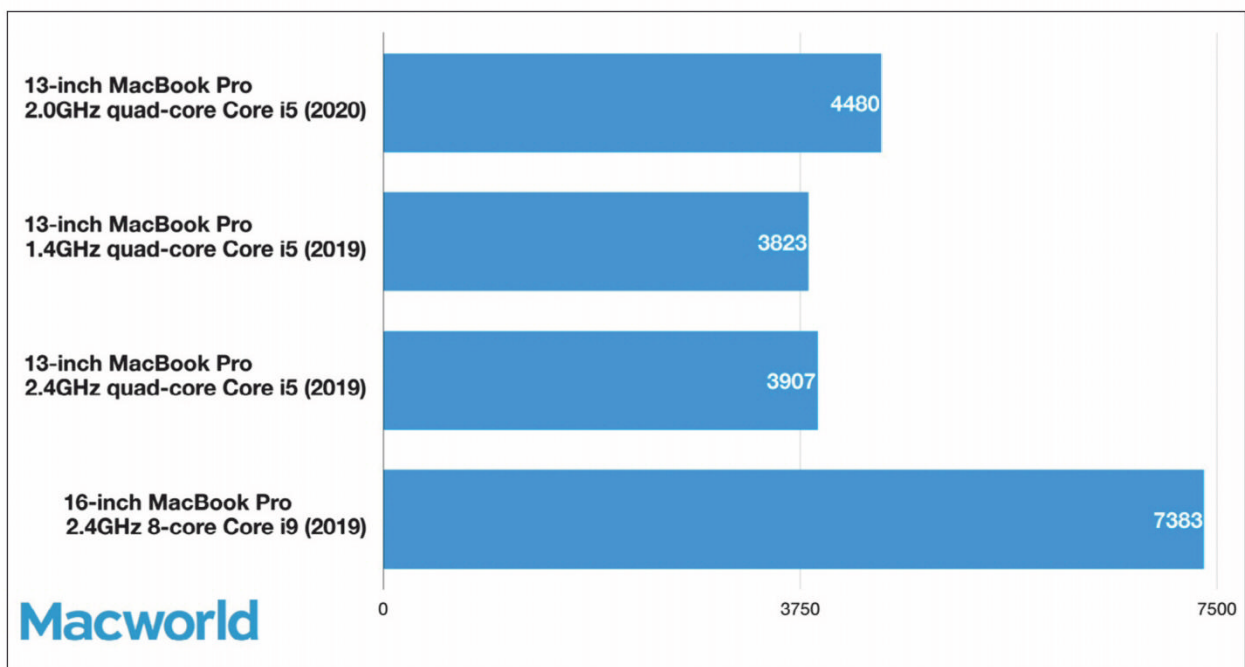
Performance

Our Geekbench 5 results see a 24 percent increase in single-core performance over the previous £1,799 2.4GHz quad-core Core i5 MacBook Pro

and the £1,299 1.4GHz quad-core Core i5 model. In multi-core testing, the boost was 14 percent. The new MacBook Pro's results in the Metal graphics test were the most impressive, with a 30 percent increase by the Iris Plus over the Iris Plus Graphics 645, and more than double the performance of the Intel UHD 630, which can be found in Apple's 16in MacBook Pro.
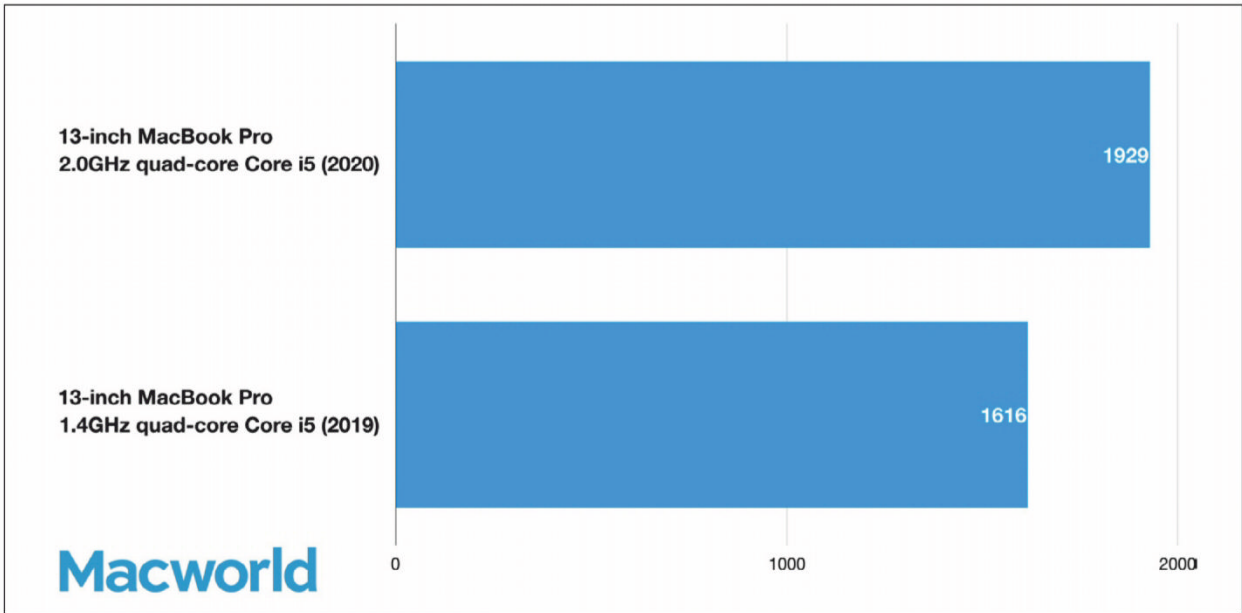
Geekbench 5

We ran a few other benchmarks to gauge the new laptop's performance. In this section of testing, we looked at the new £1,799 MacBook Pro and the most affordable 13in MacBook Pro priced at £1,299 with a 1.4GHz quad-core eighth-generation Core i5. In addition to two more Thunderbolt 3/USB-C ports, the extra £500 you'd spend gets you an

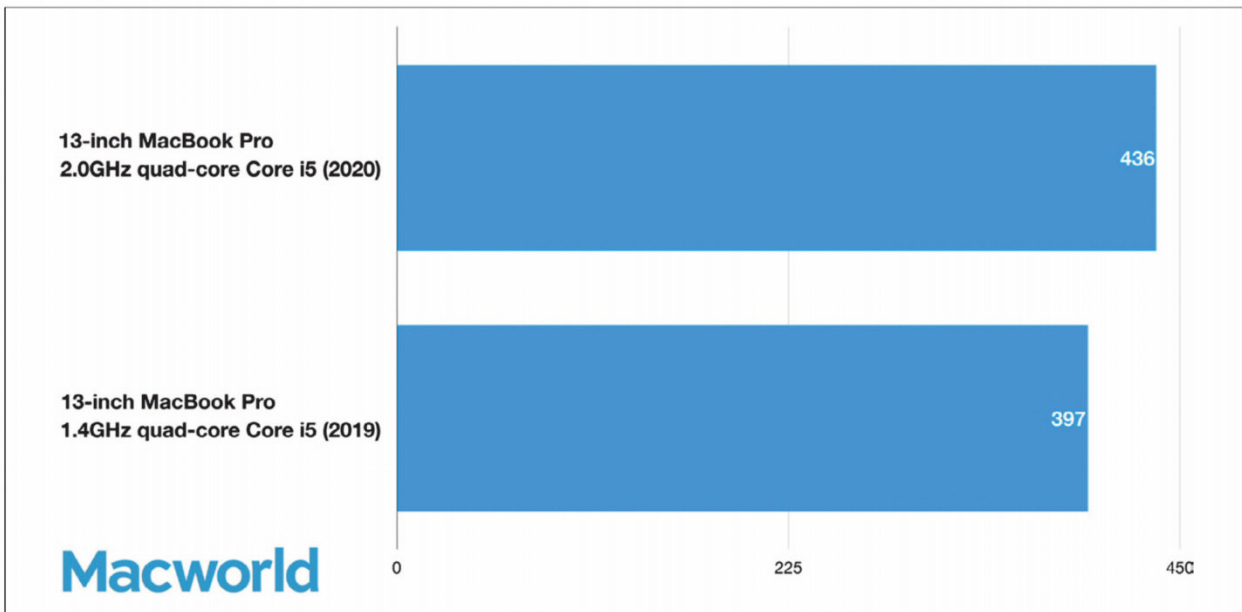| Model	Score
13-inch MacBook Pro 2.0GHz quad-core Core i5 (2020)	4480
13-inch MacBook Pro 1.4GHz quad-core Core i5 (2019)	3823
13-inch MacBook Pro 2.4GHz quad-core Core i5 (2019)	3907
16-inch MacBook Pro 2.4GHz 8-core Core i9 (2019)	7383

Macworld

Geekbench 5

up-to-date processor, more and faster RAM, double the SSD storage and more robust graphics. That should add up to better performance. We wanted a sense of how much more performance you can get.

13-inch MacBook Pro
2.0GHz quad-core Core i5 (2020)   1929

13-inch MacBook Pro
1.4GHz quad-core Core i5 (2019)   1616

0   1000   2000

Cinebench R20 multi-core

13-inch MacBook Pro
2.0GHz quad-core Core i5 (2020)   436

13-inch MacBook Pro
1.4GHz quad-core Core i5 (2019)   397

0   225   450

**Cinebench R20 single-core**

Cinebench R20

The Cinebench R20 benchmark is a CPU multithread benchmark that is more intensive than Geekbench 5's Multi-Core CPU test. The 2GHz quad-core Core i5 is a bit over 16 percent faster than the 1.4GHz quad-core Core i5. Cinebench is a rendering test, so this result is of particular interest for graphics professionals.

Blender BMW

In this rendering test we see a 12 percent improvement by the 2GHz quad-core Core i5.

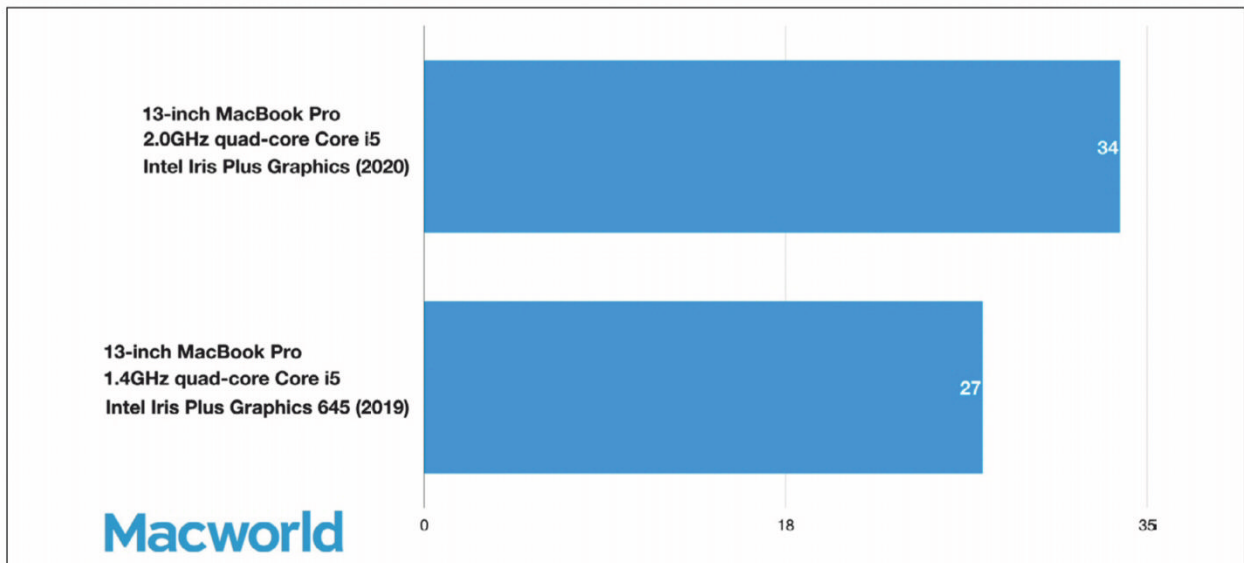## Unigine Heaven and Unigine Valley

The Unigine Heaven and Valley benchmarks are real-time graphics tests that focus on GPU performance. The newer MacBook Pro was 16 percent faster in Heaven, and 20 percent faster in Valley.
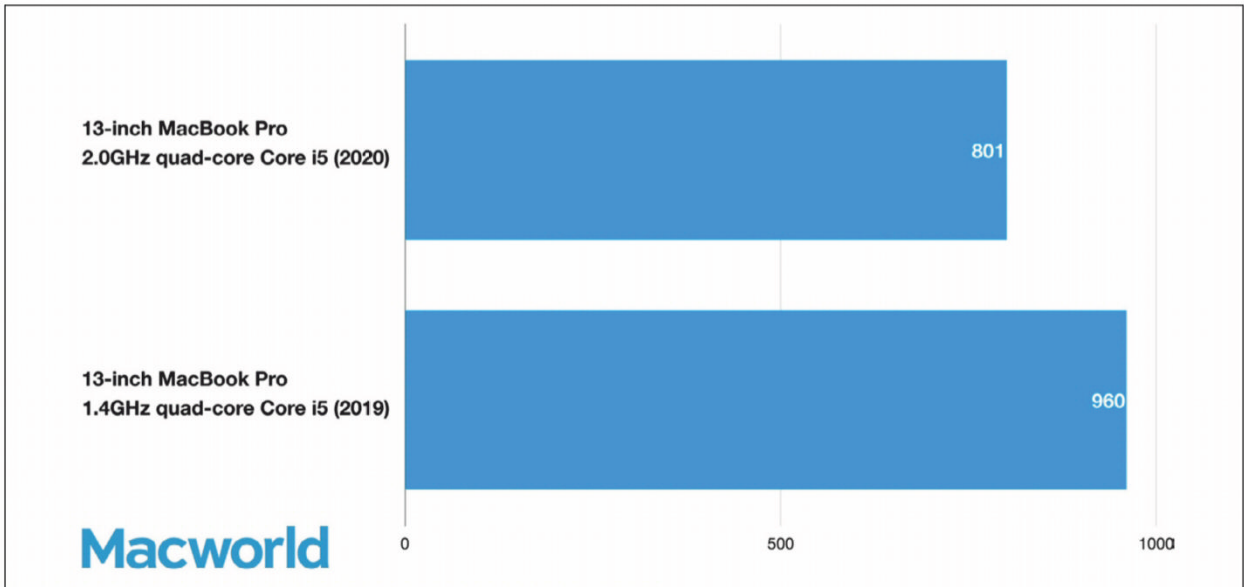
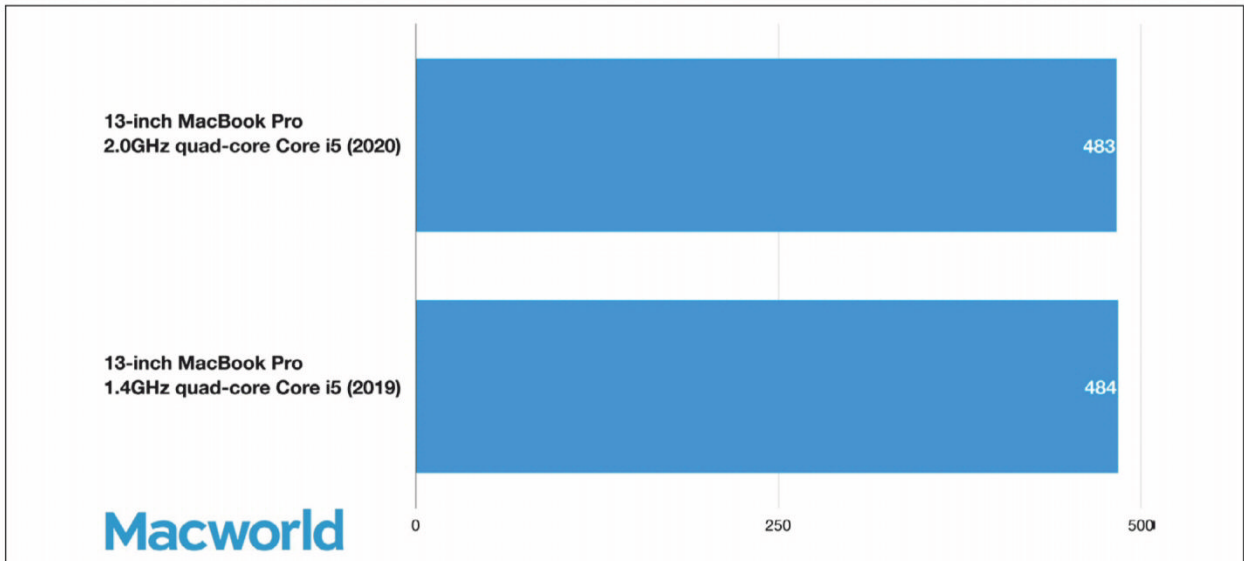|	
13-inch MacBook Pro 2.0GHz quad-core Core i5 (2020)	411
13-inch MacBook Pro 1.4GHz quad-core Core i5 (2019)	467

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Blender BMW
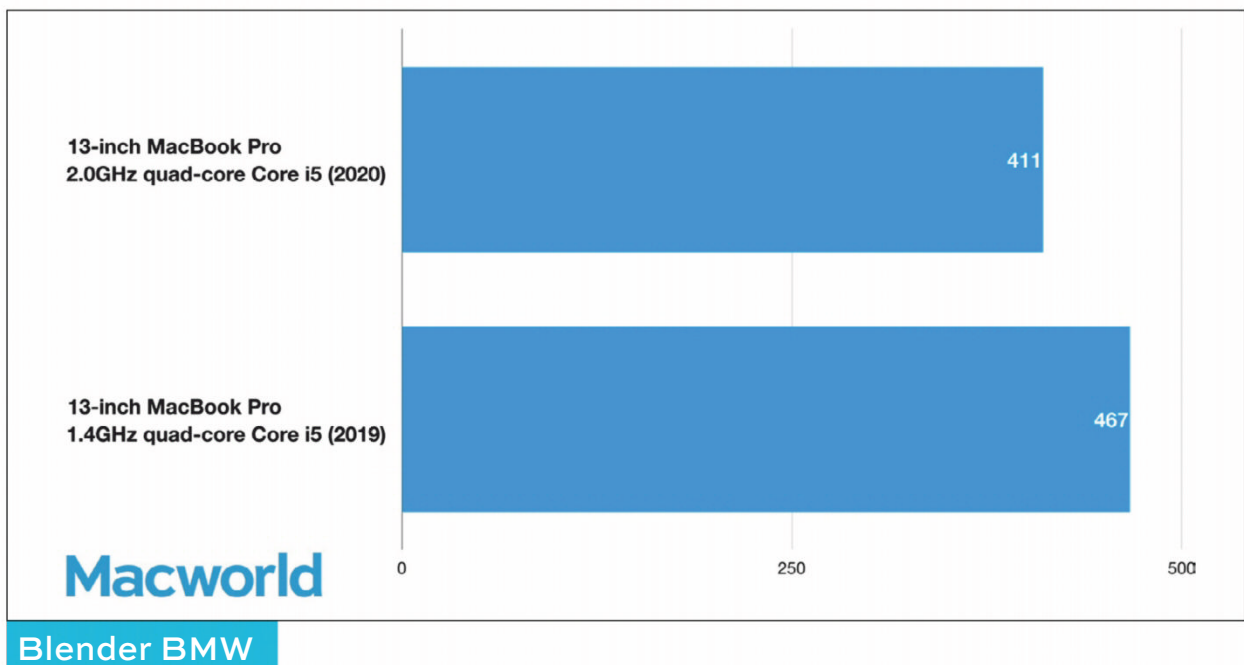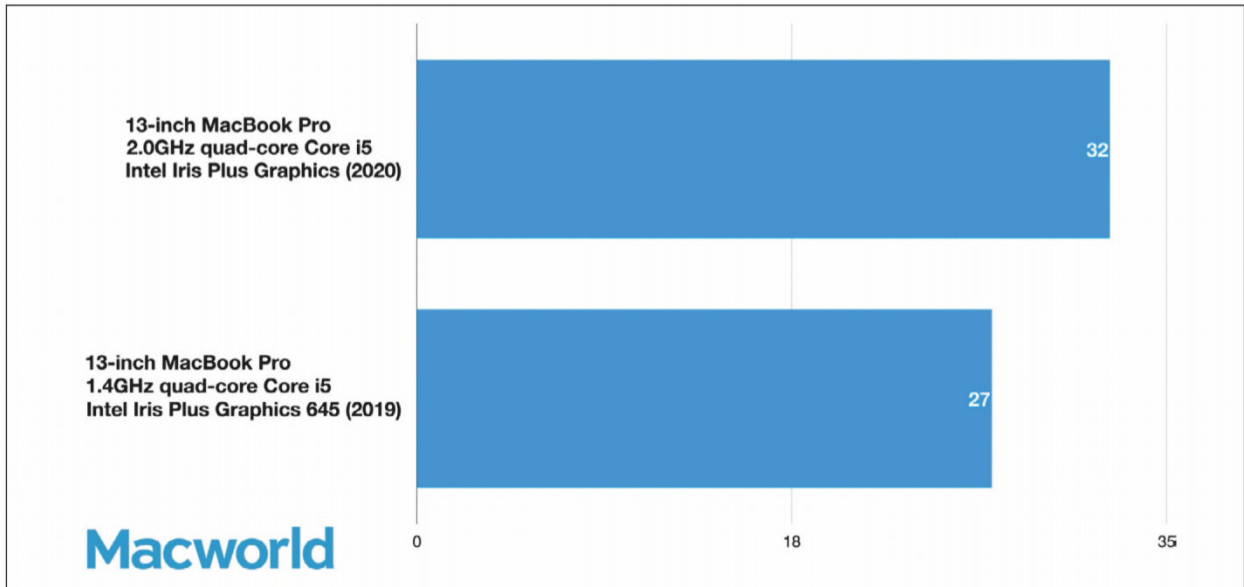
Unigine Heaven

Unigine Valley

Handbrake 4K to 1080p video encode

We took the 4K video Tears of Steel and converted it using the Fast 1080p30 preset in Handbrake. The 2GHz quad-core Core i5 is about 17 percent faster than the 1.4GHz quad-core Core i5.

13-inch MacBook Pro
2.0GHz quad-core Core i5 (2020)   801

13-inch MacBook Pro
1.4GHz quad-core Core i5 (2019)   960

0   500   1000

Handbrake 4K to 108-p video encode

13-inch MacBook Pro
2.0GHz quad-core Core i5 (2020)   483

13-inch MacBook Pro
1.4GHz quad-core Core i5 (2019)   484

0   250   500

Battery life

Battery life

Rated at 58-watt hours, the battery in the £1,799
and £1,999 MacBook Pros are a little bit smaller
than the one in the lower-cost models, which are
rated at 58.2-watt hours. Apple's says the battery

will last for "up to 10 hours wireless web, up to 10 hours Apple TV app movie playback".

To test the battery life, we looped a video until the battery ran out. (We should note that in this situation, instead of setting the display brightness at 150 nits as we usually do, we set the brightness slider in system preferences to about 90 percent.) We tested both the new laptop and the £1,299 model, and both laptops lasted just over 8 hours. The new laptop had no problem making it through a regular workday, which involved using different business apps, Internet access and the occasional viewing of an internet video.

13.3in display, not 14 inches

Apple's MacBook Pro line-up saw a significant shift when the company released the 16in MacBook Pro, whose predecessor was a 15in model. The bigger display was accomplished mostly by reducing the black bezel surrounding it. So naturally, when rumours about the successor to the 2019 13in MacBook Pro started to appear, it included speculation that the same bezel treatment would be used, creating a new 14in MacBook Pro.

That didn't happen. The display is the same as before, with the same thick black bezels. It's still a 500-nit Retina display, with a 2,560x1,600 resolution and support for the P3 wide colour gamut and True Tone. And it still looks excellent, with even backlighting, sharp text, and nice colour.

But it's disappointing that the 14in display didn't happen. My personal preference is for
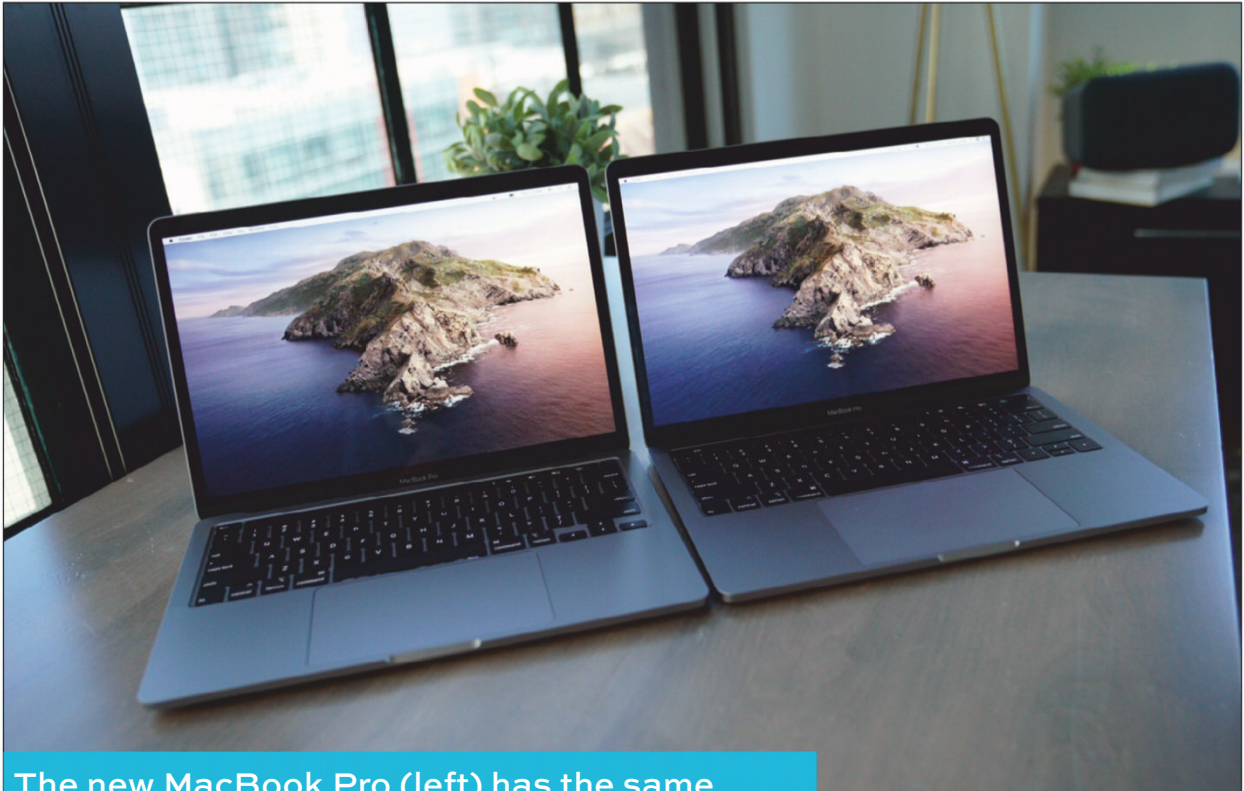
The new MacBook Pro (left) has the same 500-nit, 2,560x1,600 backlit Retina display as its predecessor (right). Including the big bezel

larger screens, but besides that, there's an aesthetic with the bezel that didn't really catch my eye until the 16in MacBook Pro was released, and it's emphasized even more if you also use an iPhone that doesn't have a Home button. The bigger bezel looks dated, on the brink of looking old, even. The design of the MacBook Pro line-up has been in place for years, so looking dated is an eventuality, but the reduced bezel on the 16in model was enough to give the design a bit of a refreshed, modern look.

Obviously, Apple made a design decision to not change the bezel. We can only speculate as to

why. There have been rumours that Apple will be releasing a ARM-based Mac laptop, maybe even as soon as 2021, and perhaps there's some line of thinking that ties significant design changes to that. Or maybe there's a more practical reason: maybe there are performance and heat issues with using a larger display in this small of a form factor. At this point, it's all purely conjecture.

Storage and other features

Apple also took this opportunity to adjust the standard SSD configurations of the 13in MacBook Pro. Gone is the 128GB SSD configuration – thank goodness. Apple's line-up now starts at 256GB and tops off at 1TB, with two 512GB models in-between. You can adjust the amount of storage, all the way up to 2TB, if you want to pay more.

The £1,299 and £1,499 models each have two Thunderbolt 3/USB-3 ports, while the £1,799 and £1,999 models have four. If you haven't already, you might want to consider buying a USB-C hub, especially if you have external devices that use a USB-A connector.

Apple introduced a new 6-speaker system in the 16in MacBook Pro that sounds pretty powerful. The new 13in MacBook Pro didn't get the same treatment, however. It still has the same wide stereo speaker system as before. And it sounds fine, but it's clearly not in the same league as the 16in model.

In this time of sheltering in place and working remotely, new attention has been brought upon the FaceTime camera in Apple's laptops. It's still a 720p

Professionals will appreciate the increase in graphics performance

camera, and its image quality is very disappointing, especially when you compare it to the front-facing cameras on modern iPhones. It's gone too long without being upgraded.

Verdict

Apple users have been waiting for an upgrade to the 13in MacBook Pro. The question here is, is there enough in the new laptop to be worth the investment? There's certainly enough here for professionals to consider, especially if the MacBook Pro you're using is more than two years old. While the CPU boost is noticeable, you'll especially like the increase in graphics performance.

For the general consumer, if you aren't spending most of your time in pro apps that can take advantage of the faster graphics, and you have a 13in MacBook Pro that was bought within the past four years, you're probably fine for now. However, there is that new Magic Keyboard, and if you're absolutely tired of the butterfly keyboard, make the switch. Your hands will thank you.

After testing the 16in MacBook Pro last November and now this model, one thing is clear to me: I'm ready for some drastic changes to the MacBook line-up. The rumours of Apple making an ARM-based laptop persist, and it could happen next year, starting with a consumer-level machine. That would mean the MacBook Pro would remain unchanged (at that moment), but a new ARM-based laptop would show where Apple is headed with the technology and design. It could bring back some much-needed excitement to Apple's laptop line-up. **Roman Loyola**

Specifications

- 13.3in (2,560x1,600; 227ppi) LED-backlit display with IPS technology
- macOS Catalina
- 2GHz quad-core 10th-generation Intel Core i5, Turbo Boost up to 3.8GHz, with 6MB shared L3 cache
- Intel Iris Plus Graphics
- 16GB of 3733MHz LPDDR4X onboard memory, configurable to 32GB of memory
- 512GB SSD, configurable to 1TB, 2TB or 4TB SSD
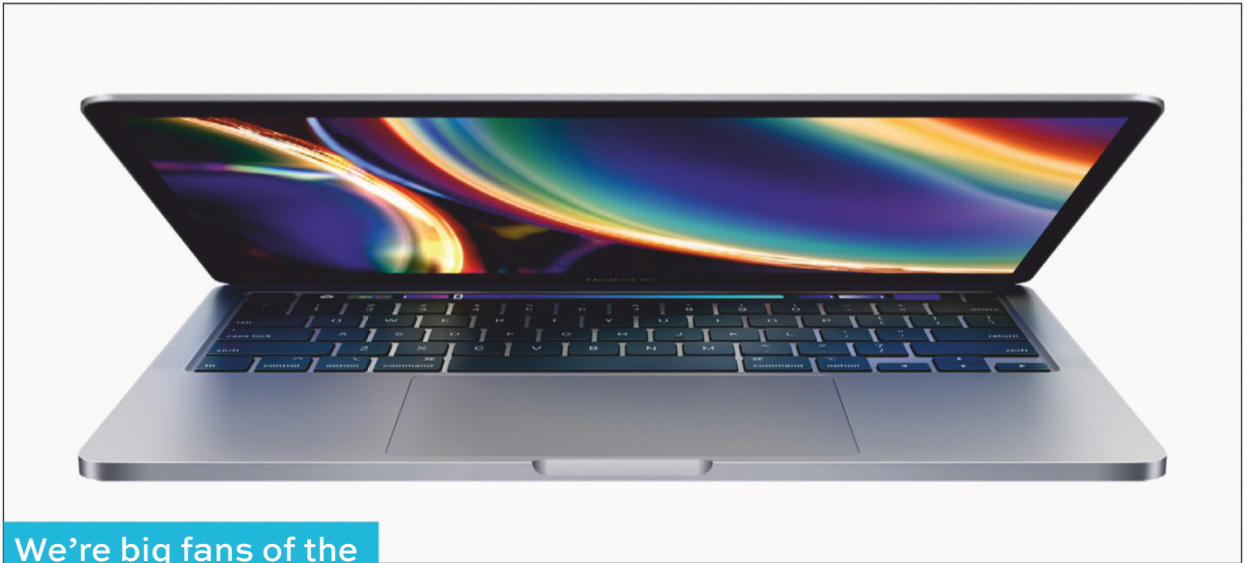
We're big fans of the new Magic Keyboard

- 4x Thunderbolt 3 (USB-S) ports
- 3.5mm headphone jack
- 802.11ac Wi-Fi
- Bluetooth 5.0
- 720p FaceTime HD Camera
- Dolby Atmos speaker system
- Backlit Magic Keyboard
- 58-watt-hour lithium-polymer battery
- 304.1x212.4x15.6mm
- 1.4kg

iPhone SE (2020)

RATING: ★★★★⯪

Price: **£419 (inc VAT)** from **fave.co/3dDiG2X**

The new iPhone SE is tricky to review not because it incorporates a lot of interesting new technology to test and explain, but because it does the opposite. Literally nothing here is new. One could write a comprehensive and accurate review in a single short sentence: Apple took and iPhone 8, gave it the iPhone 11's processor, and is charging only £419 for it.

And yet it's that last part, the affordable price, that makes it so interesting. For many millions of

Physically, the iPhone SE (centre) is nearly identical to the iPhone 8 (left), and much smaller than the iPhone 11 (right)

potential of customers, a brand-new iPhone has remained out of reach. For so many others, their years-old iPhone is overdue for an upgrade but the new iPhones give them sticker shock.

This phone offers nothing at all to anyone who has an iPhone released in the past couple years, but for its intended audience of iPhone 6 upgraders and 'I got this basically free from my carrier' customers, the new iPhone SE is the most outstanding value since, well, the old iPhone SE.

iPhone 8 redux

At a glance, it's hard to tell the iPhone SE from an iPhone 8. They're exactly the same size with precisely the same button placement – iPhone 8 cases work just fine on the iPhone SE. There are

The iPhone SE supports wireless charging, as the iPhone 8 did. But if you're coming from an older iPhone, it's new to you

small changes, like the way the iPhone SE's front is all black no matter the back glass colour, or the now-centred Apple logo on the back. In essence, though, this is an iPhone 8 on the outside.

It's just like the iPhone 8 in most other ways, too. Both have IP67 water resistance. Both support wireless charging. The new phone has the same 4.7in Retina HD (that's approximately 720p) LCD display, too. You won't really notice that the resolution is a bit limited by today's standards, but you will see that it's not quite as bright as newer phones. We measured a maximum brightness of 750 nits, which isn't bad for a £419 phone, but the iPhone 11 cranked out 900 nits. In bright daylight, that makes a big difference.

I hope you like Touch ID, because at these prices you don't get Face ID
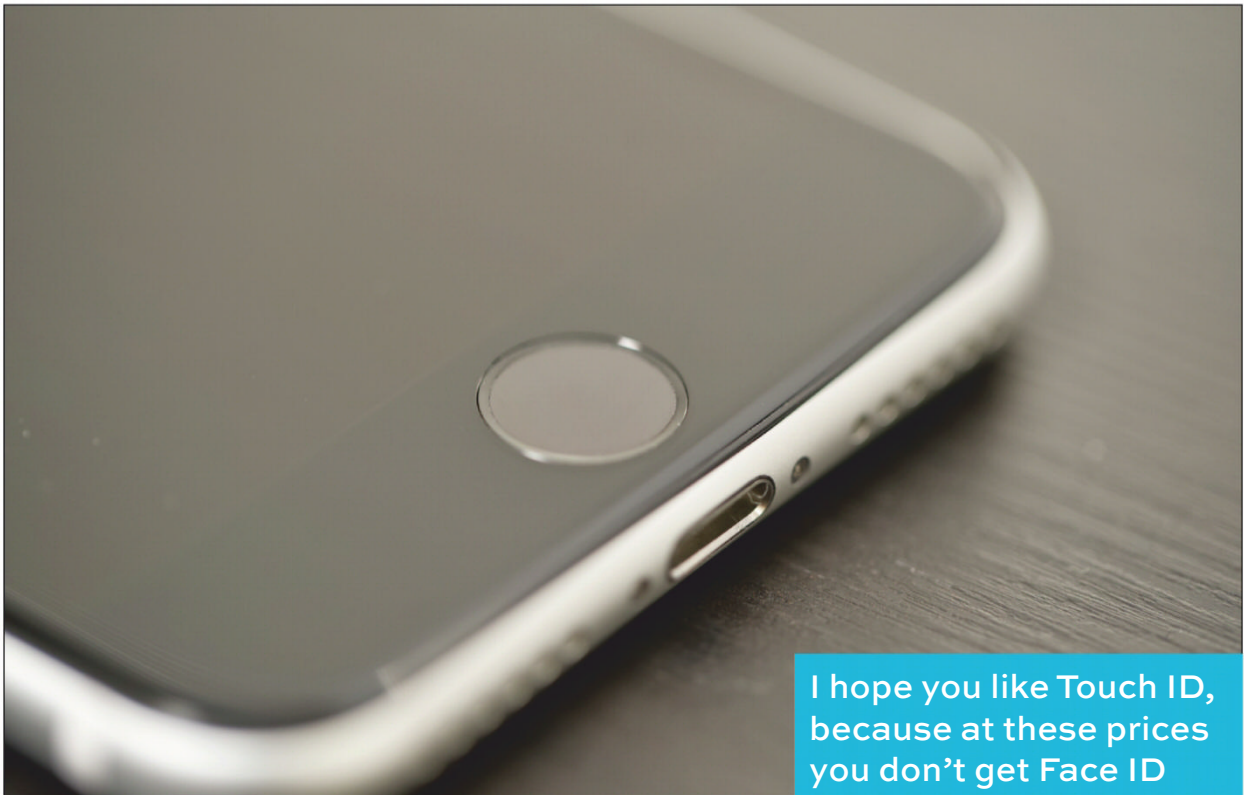
If you're a fan of small phones, you'll enjoy the diminutive size and feather-light weight of the SE. Every iPhone since the iPhone 8 has been bigger, and the rest of the smartphone industry has followed the same trend. Three years ago when it was new, we didn't think of the iPhone 8 as especially small, but it's one of the smaller phones today.

And of course, the iPhone 8 was the last iPhone (until now) to feature a Home button and Touch ID instead of an edge-to-edge display and Face ID. The last couple years of iOS development have focused on gesture control for Home-button-free iPhones, and it feels really weird to go back to using one.

If every iPhone you have ever owned has had a Home button, you'll feel right at, well, home with the

iPhone SE. It's understandable that Apple would forgo the expensive TrueDepth module and edge-hugging display on a phone meant to cost only £419, but it still feels like a step back.

Unnecessarily high performance

The biggest difference between the iPhone 8 and the SE is the processor. The A13 Bionic in the SE is dramatically faster than the A11 in the iPhone 8.
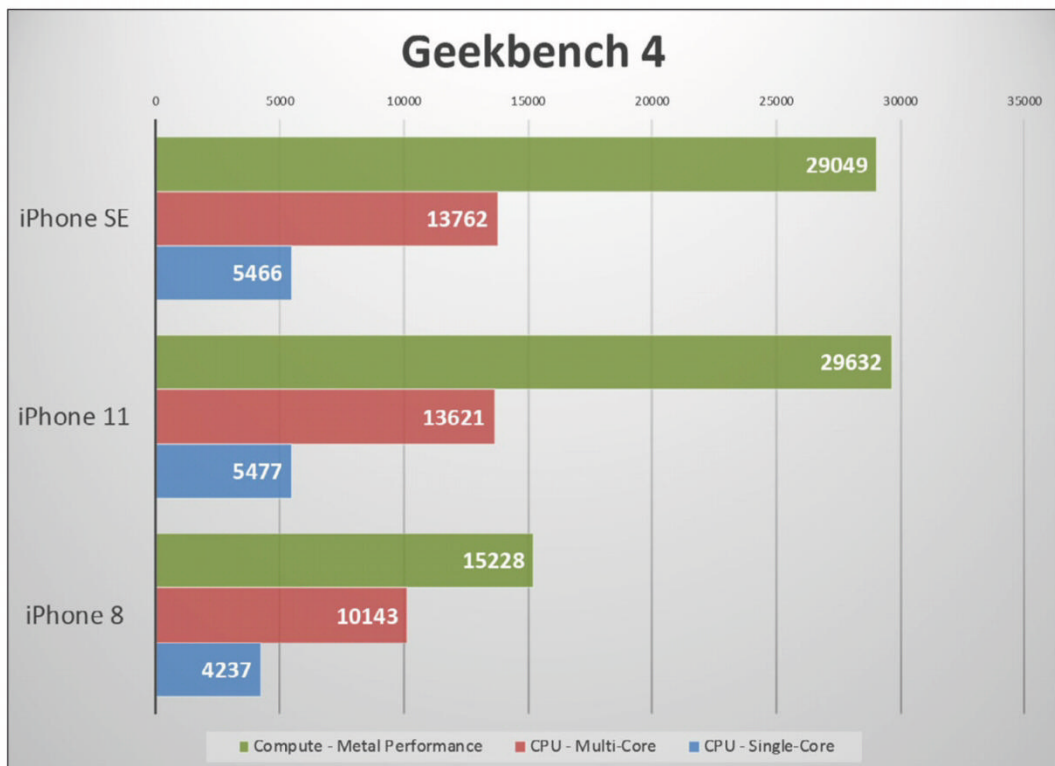
Benchmarks for the iPhone SE show it to perform essentially the same as the iPhone 11. Single-threaded and multithreaded CPU performance are both about 30- to 40 percent faster than the iPhone 8 in most benchmarks. Our
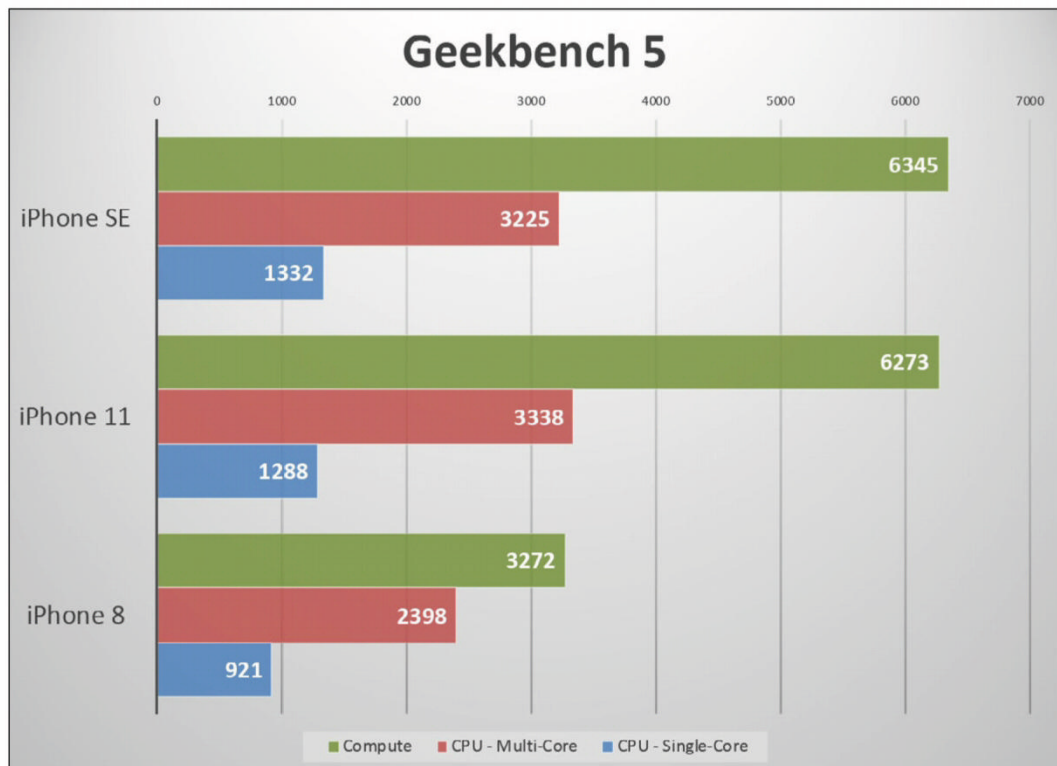

The newer Geekbench 5 benchmark shows the same story. You get the performance of the best iPhone at half its price

Geekbench 4 and 5 test results show just what we expect: the iPhone SE performs exactly on par with the iPhone 11, a phone that costs hundreds more. It's faster than nearly all Android phones in these tests, regardless of price.

Graphics performance takes a big step up, too. Depending on the program, it can be anywhere from 40- to 60 percent faster than the iPhone 8. Interestingly, while the older 3DMark Ice Storm Unlimited test delivered the results we expect (equal to the iPhone 11), the newer Sling Shot tests were quite a bit slower, though still faster than the iPhone 8. We're not sure what causes this discrepancy, but we ran the tests multiple times to

Geekbench 4

	Compute - Metal Performance	CPU - Multi-Core	CPU - Single-Core
iPhone SE	29049	13762	5466
iPhone 11	29632	13621	5477
iPhone 8	15228	10143	4237

In Geekbench 4, the iPhone SE is tied with the iPhone 11, as expected. It seriously outclasses the iPhone 8
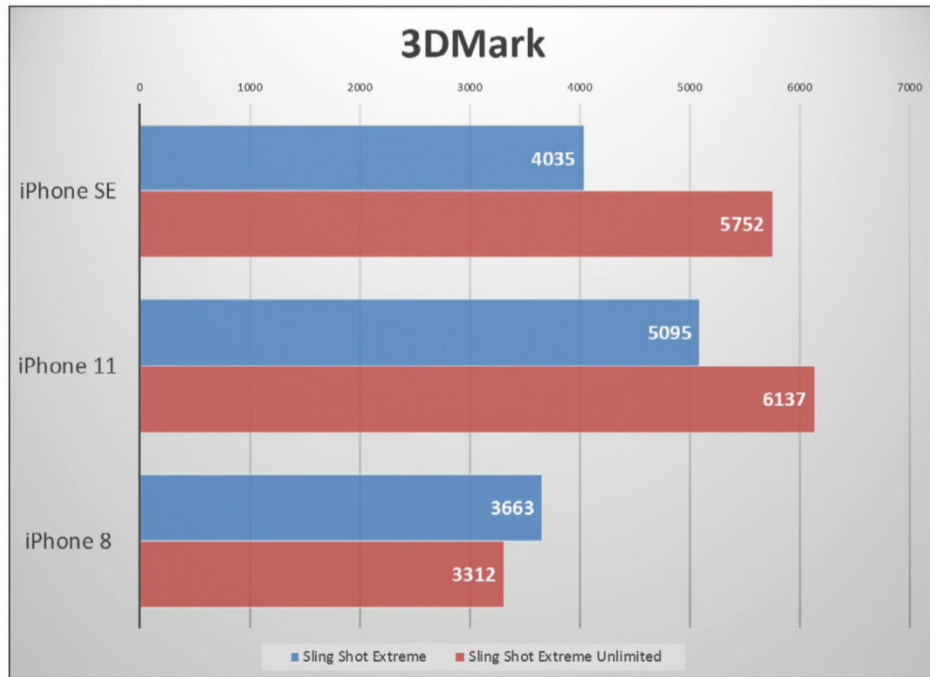
3DMark

For some reason we can't pinpoint, the 3DMark Sling Shot tests are slower on the iPhone SE than the iPhone 11
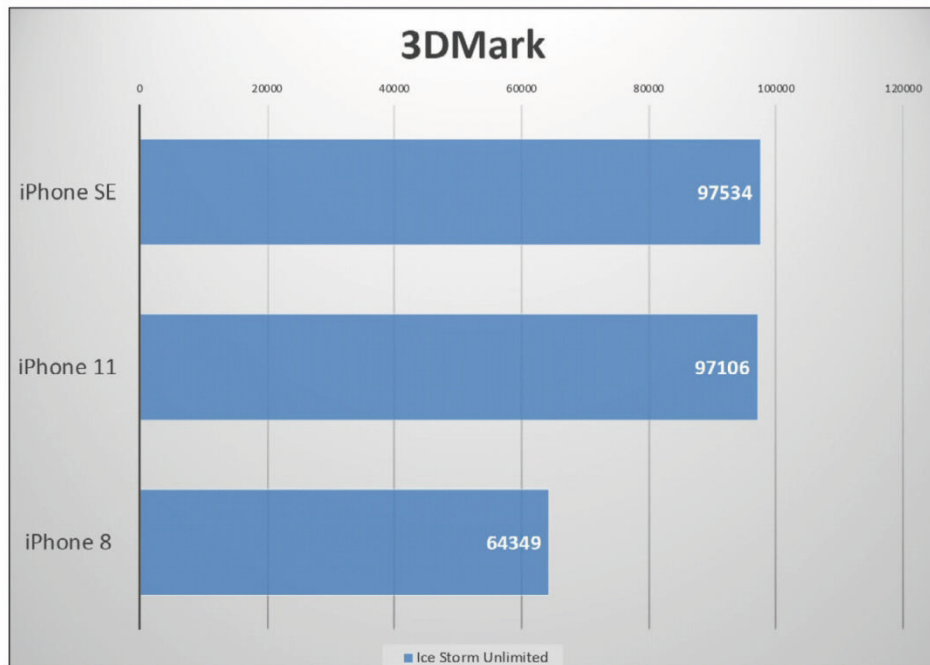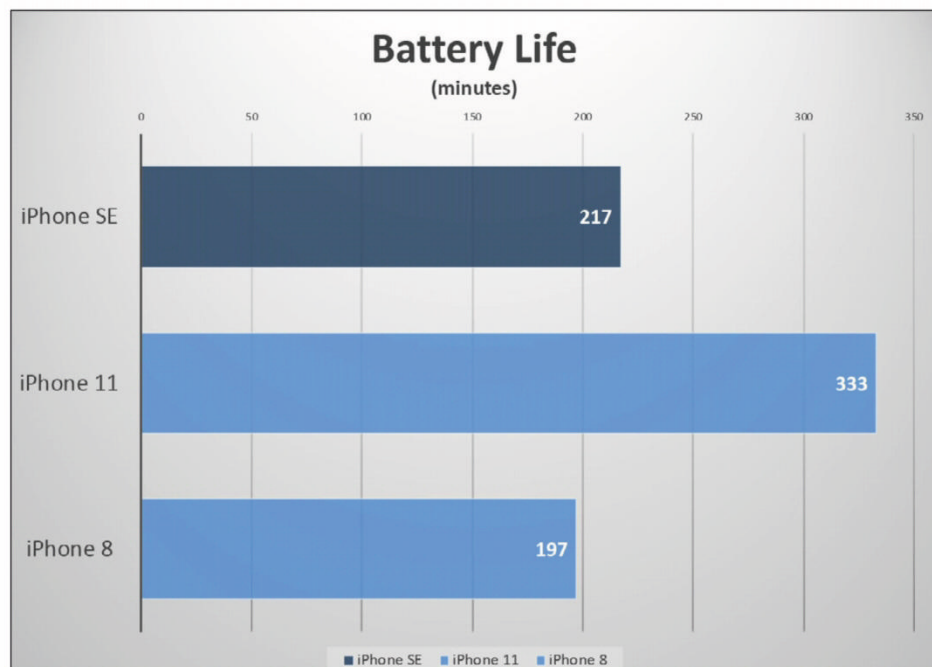

3DMark

But other graphics tests, including other 3DMark tests, show equal performance between the iPhone SE and iPhone 11

confirm it. No matter – with a display resolution of only 1,334x750, the GPU in the A13 is total overkill. It's going to run any modern graphics-intensive game or program beautifully.

Machine learning is a whole lot faster, too. While the A11 Bionic in the iPhone 8 introduced Apple's first Neural Engine, newer processors are several times faster at performing Machine Learning tasks. The A13 here is accompanied by 3GB of RAM – up from 2GB in the iPhone 8, but down from 4GB in the iPhone 11.

If you're coming from an older phone, like an iPhone 6s or even the previous iPhone SE, you're going to see a night-and-day difference in performance. Everything is going to fly. Let this sink in for a moment: Apple's £419 phone is, in most

Battery Life
(minutes)

Phone	Minutes
iPhone SE	217
iPhone 11	333
iPhone 8	197

■ iPhone SE ■ iPhone 11 ■ iPhone 8

Battery life is barely any better than the iPhone 8. Not bad for a £419 phone, but not nearly as great as other new iPhones

respects, faster than the fastest Android phone you can buy at any price.

If there's a shortcoming in the iPhone SE hardware, it's that it has the same battery capacity as the iPhone 8, and essentially the same battery life. Our Geekbench 4 run-down test (with the display set to 200 nits) ran for 3 hours 37 minutes, just 20 minutes longer than the iPhone 8.

Mind you, this is running an intensive benchmark in a continual loop, and your actual day-to-day battery life will be a lot longer. I didn't have trouble getting through a full day of regular use. On the one hand, it's impressive to see the same battery capacity last just as long with such dramatically improved performance. On the other hand, the other iPhones, while more expensive, will last a lot longer on a charge.

A good enough camera

The iPhone SE has the same camera sensors as the iPhone 8 – we think. Apple would not answer a direct question to confirm that, though it does have identical specs: the lone rear camera is 12Mp with an f1.8 aperture and optical image stabilization, the front is a 7Mp sensor with f2.2 aperture. The iFixit teardown (see **fave.co/2Yj9r1E**) seems to confirm that the iPhone 8 and iPhone SE camera modules are identical.

Apple prefers to focus on the 'camera system', which includes the image signal processor and neural engine of the A13 chip. It's a legitimate point, as so much of smartphone

In good light, the iPhone SE is capable of sharp, colourful, detailed photos with good dynamic range, nearly on par with the iPhone 11 Pro

image quality depends on the image processing handled by a variety of specialized parts of the processor.

As a result of the bump from the A11 to the A13, the iPhone SE produces much higher quality images than the iPhone 8, despite using what we believe are the same sensors and lenses. It can pull the iPhone XR's trick of single-camera Portrait Mode on the rear camera, and for the first time ever on an

The SE (2020) can do Portrait Mode with its front camera, and the results are quite good

Try to take a Portrait Mode shot without a human face present and you'll get an error message: No person detected

iPhone, on the front camera as well. The iPhone X and later models do Portrait Mode selfies using the TrueDepth module that powers Face ID, but the iPhone SE is the first to do it with just a single standard front-facing camera.

It should be noted that both the front and back camera only perform Portrait Mode and Portrait Lighting in the Camera app when they detect a human face. Portrait Mode shots of your pets or inanimate objects are not available. But the phone is producing an estimated depth map, which means that third-party camera apps could conceivably give you portrait-like effects on any subject.

While the iPhone SE has the same powerful

If you want Portrait Mode shots of your pets, you'll have to pay more for an iPhone with dual rear cameras

image processing as the latest iPhone 11, because it doesn't have the same sensors it doesn't produce results that are quite as good. Notably, it's not as good in low light. The Night Mode and Deep Fusion features of the iPhone 11 are totally absent. In good light, the iPhone 11 and iPhone SE take remarkably similar photos. As the light gets worse, the iPhone
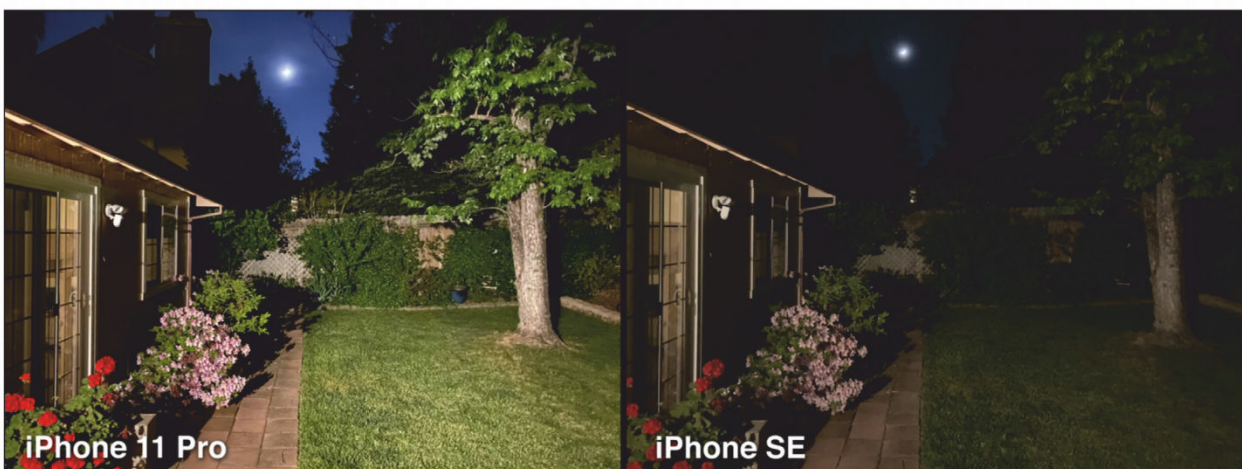
Another trick of the iPhone 11 you won't find in the SE: Night Mode. These shots were produced under identical conditions

11's superiority is clear. You can take fantastic video with the iPhone SE, too – up to 4K at 60fps, or 1080p at 240fps. The detail, dynamic range, and clarity of video is far superior to any other phone in this price range.

Verdict

The new SE is perhaps the least interesting iPhone to debut in years. It's just the latest processor stuffed into an old iPhone 8, right? There's nothing new to see here, and that makes it boring to Apple enthusiasts always hungry for the next insanely great thing. But it's precisely because Apple reuses existing parts that it is able to sell such a thoroughly decent new iPhone for only £419. You can pay £50 more to jump from 64GB of storage to 128GB, which is a good value and recommended. Years from now, you'll be glad you did. A 256GB version is £569, which is not worth the cost.

This is a brand-new iPhone that costs about half of what an iPhone 11 does, or a third of the top-end iPhone 11 Pro Max. It's inexpensive enough that many users will get one by paying something like £5 per month more on their carrier bill, or get it 'free' with the purchase of another phone and a two-year agreement.

The value is off the charts. With the A13 inside, it's faster than Android phones that cost twice as much. Photo and image quality is excellent for this price range. It will get software updates for years where similarly-priced Android phones will be lucky to get a single major Android update.

This clearly isn't Apple's absolute best iPhone, but it's the best choice for many millions of users. It is Apple's least interesting iPhone in years, and simultaneously, perhaps, the most important. It's hard to overstate how big the market is for those who just want an affordable new iPhone that will last another four or five years, even if it doesn't have every new fancy feature. We can only hope Apple doesn't wait another four years to produce another new iPhone SE model. **Jason Cross**

Specifications

- 4.7in (1,334x750; 326ppi) Retina IPS LCD capacitive touchscreen
- iOS 13
- Apple A13 Bionic (7nm+) processor
- Hexa-core (2x 2.65GHz Lightning + 4x 1.8GHz Thunder) CPU
- Apple GPU (4-core graphics)

The iPhone SE is fantastic value

- 3GB RAM
- 64/128/256GB storage
- Rear-facing camera: 12Mp, f/1.8 (wide), PDAF, OIS
- Selfie camera: 7Mp, f/2.2
- 802.11 a/b/g/n/ac/ax Wi-Fi
- Bluetooth 5.0, A2DP, LE
- GPS with A-GPS, GLONASS
- Fingerprint scanner (front-mounted)
- USB 2.0, proprietary reversible connector
- 138.4x67.3x7.3mm
- 148g

Macworld

FROM IDG

JUNE 2020

REVIEWED: APPLE'S NEW

MACBOOK AIR

PERFECT COMBINATION OF STYLE, PERFORMANCE AND AFFORDABILITY

PLUS: 12.9in iPAD PRO REVIEW

Apple Magic Keyboard for 12.9in iPad Pro

RATING: ★★★★⯨

Price: **£349 (inc VAT)** from **fave.co/2YQiLMi**

Apple's keyboard cases for the iPad tend to emphasize protection. The keyboard itself often feels like an afterthought. Even in the best cases, it comes off as a grudging concession to those of us who really don't want to use the digital keyboard for long typing sessions.
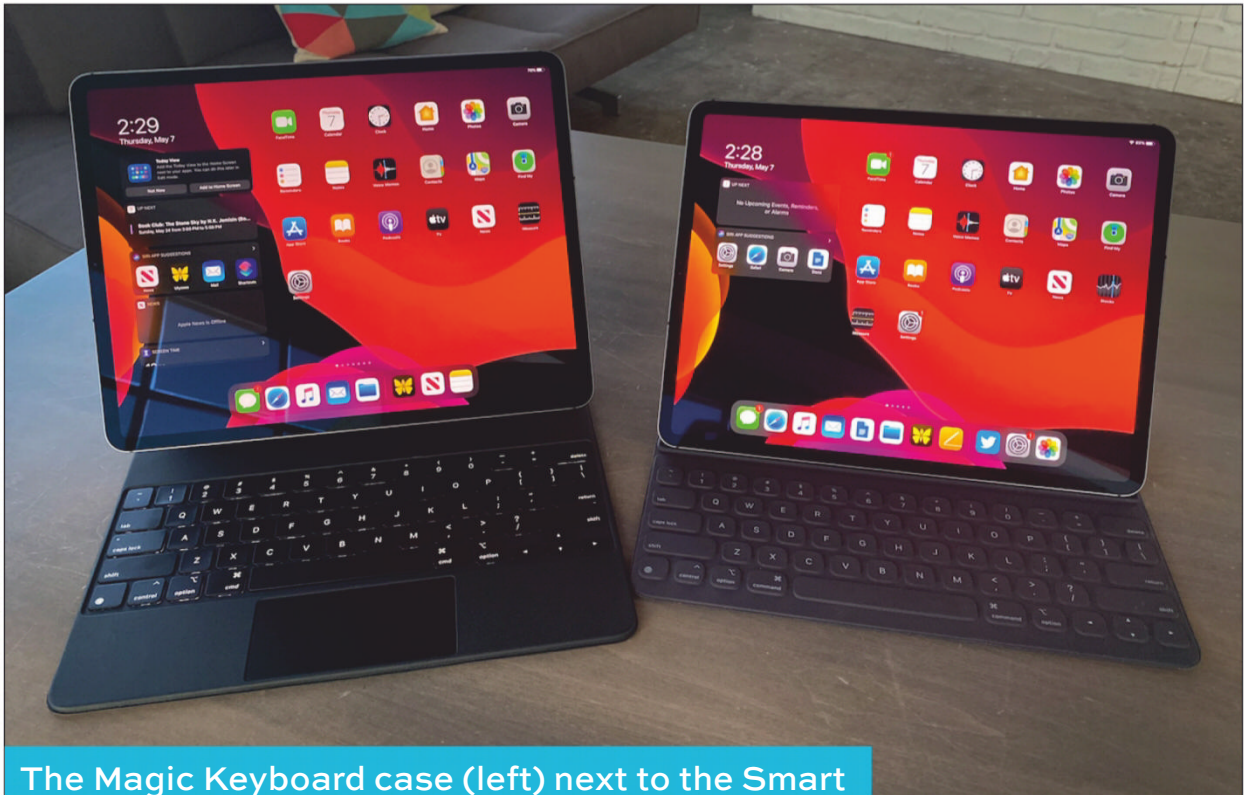
The Magic Keyboard case (left) next to the Smart Keyboard Folio. Both tablets are 12.9in iPad Pros

But Apple's new Magic Keyboard for iPad Pro is the first one that actually feels as though you were meant to work on it. The backlit keys have great key travel, and they're wide enough to recall the ones you'll find on a MacBook. These features would have been impressive on their own, but Apple went a step further and included a trackpad and a dedicated charging port that greatly enriches the experience.

Taken together, these are signs that Apple is not only changing its ideas of what constitutes a good iPad keyboard case, but also in how the views the purpose of the iPad itself. For those of us who want to use Apple's tablet in a workplace setting,
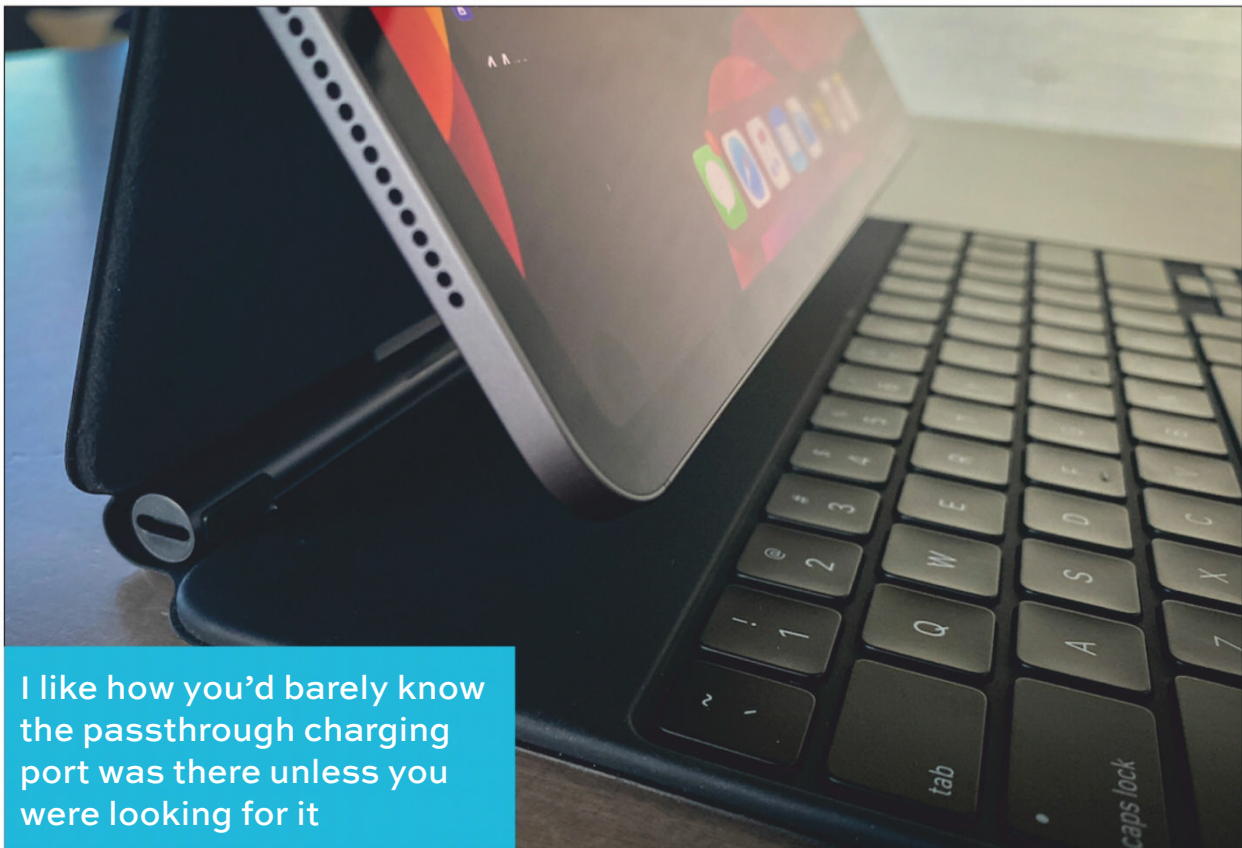
I like how you'd barely know the passthrough charging port was there unless you were looking for it

that's good news – although, as we'll see, it comes with a hefty price.

As with the Smart Keyboard Folio before it, 'installing' the Magic Keyboard case involves nothing more than slapping the iPad Pro on the strong magnets inside the case. It pairs instantly just by touching the Smart Connector, so – unlike with a Bluetooth keyboard – you can already use it when you're, say, entering your Wi-Fi password while setting up a brand-new iPad Pro.

The real improvements, though, appear once you open the case all the way. With the Smart Keyboard Folio, you simply propped the iPad into one of two grooves, which didn't allow for a lot of options

This isn't really all that feasible, either, since the hinge starts moving with only a slight bit of pressure

for viewing angles. The Magic Keyboard, though, features a system of two hinges that makes the iPad 'float' about an inch above the keyboard, allowing you to tilt the screen until it settles into the perfect viewing angle. It's quite sturdy. Apple has released an ad depicting a hummingbird tilting the display backward just by tapping it, but in my experience it's going to take a bit more force than that.

I'd go so far as to say that I like this kind of display arrangement more than the traditional laptop layout option, were it not for the fact that my fingers sometimes bump into the underside of the iPad while I'm typing. If you have big hands, it's something you'll want to watch out for.

Nor does Apple limit the hinge to one job, as you can also charge the iPad itself through the USB-C/Thunderbolt 3 port on the left end of the largest one. You can't use this port for anything else, but fortunately it frees up the USB-C port on the tablet itself so you can hook up all the external drives, cameras and other devices now supported with iPadOS.

This is all great news for anyone who's been wanting to use their iPad Pro more like a laptop. It's not an ideal case, though, if you're an artist or frequent Apple Pencil note-taker. Because of the hinges and the need for balance, the Magic Keyboard case only opens to a specific angle, as the other hinge handles the actual tilting. As a result, there's technically no 'drawing board' orientation for this case, although you can find a few examples of users sort of making it work online. It looks dorky, to be sure, but at least it's an option. At the very least, you can easily take it out of the case.

Keys to success

But most people are more likely to be excited by the keyboard itself – aside, that is, from the lack of any kind of 'function' keys above the number keys. Such keys are all but standard on most third-party iPad keyboards as they're handy for dimming the backlit keys (which is a massive pain here that involves a trip into the Settings app), and it's odd to see this extra row missing on a device from the same company that gave us the Touch Bar. I would have

It's beautifully responsive, too

imagined that if any company would understand the conveniences of that extra row, it would be Apple.

The actual keys go a long way toward making up for it. They're big, backlit and they feel a lot like the keys on a MacBook, which is a welcome switch from the strange, nearly flat canvas-covered keys on the iPad Pro. Without exaggeration, it's the best typing experience I've ever experienced on an iPad keyboard from Apple – or any other company, for that matter. I like it so much that I find myself wishing Apple's normal, standalone Bluetooth Magic Keyboard was a bit more like this.

The real star of the Magic Keyboard is the small, two by four-inch clickable trackpad perched

below the keyboard, which greatly improves the experience of using an iPad in its 'laptop' orientation. Want to head back to the home screen at any time? Just swipe up with your three of your fingers and you're done. Want to scroll through all of your apps from the home screen? Swipe left or right with two of your fingertips

Because a trackpad so neatly allows for the recreation of many of iPadOS's core gestures, I already find it more useful than I do on my Mac. (This may be controversial, but I also prefer the smaller size of the Magic Keyboard trackpad.) Most surprisingly at all, it works so well that I haven't felt the urge to hook up a mouse. Its chief appeal lies in the way it removes the need to keep reaching up to poke the iPad screen in the middle of a task, as you can now perform a similar gesture without worrying about moving your hands too far from a typing position. Over time, the seconds you save become minutes. It's also simply less distracting when you're zoned in on your work.

The Magic Keyboard is beautifully designed for a keyboard case. And if it cost about £50 less than it does right now, then I'd be telling everyone to go and get it right now. But even considering its USB-C port, even considering its grippy and sufficiently tough exterior, the Magic Keyboard is still basically just a keyboard with a trackpad. The presentation might be innovative, but the individual parts are nothing new.

And that's why it's hard to stomach the fact that Apple is charging £349 for the 12.9in model I'm

Just to be clear, this is as far as the Magic Keyboard opens if you don't move the second hinge. In other words, you won't be flipping the keyboard behind the iPad with this model

using, and £299 for the smaller 11in model. To put that price in some perspective, Apple's baseline 10.2in iPad starts at £349. Yes, if that didn't click, this keyboard case costs the same as an iPad. And once you saddle this thing on the least-expensive 12.9in iPad Pro, you're looking at a minimum price of £1,318. For more perspective, you could buy a 512GB MacBook Air for less money. The catch, of course, if that you can't just take off the keyboard on a MacBook Air. That's possible here.

Then there are other considerations to keep in mind, too. With the iPad Pro attached, it weighs a whopping 1.35kg, for one thing. It's good for protection, but only to an extent – as with the Smart

Folio Keyboard, there's no protection around the edges, so too bad if your iPad Pro plummets to the cement on its side. On the bright side, I do like that it's still compatible with the 2018 iPad Pro. The Magic Keyboard paired fine with that unit, and the only real downside is the slightly larger hole for the camera array since the 2018 model had a smaller lens.

Verdict

The Magic Keyboard for iPad Pro is the best keyboard case for the iPad that Apple has made to date. Its backlit keys make typing feel more fun than forced, and its adjustable display makes it easier to find a comfortable viewing angle – so long, that is, as you don't want it tilted too far back. Already after a few days I find it really hard to recommend the Smart Folio Keyboard in place of this.

The only real exceptions I can think of are if you're an artist or if you work in a gritty environment where sand and other particles could slip under the keys – but in that case, you probably shouldn't be carrying a tablet as expensive as the iPad Pro there in the first place. **Jason Cross**

SteelSeries Nimbus+

RATING: ★★★★☆

Price: **£69 (inc VAT)** from **fave.co/2MGH8Fc**

f you love playing games on your iPhone, iPad, Mac or Apple TV, you've probably noticed that some of hottest titles really are meant to be played with a game controller.

The new Nimbus+ from SteelSeries is our pick for the best all-around MFi game controller – an officially certified and licensed controller that seamlessly works with all your Apple devices. The only thing is, you don't really need an MFi controller

the way you used to. With the introduction of iOS 13, you can use an Xbox One or PS4 DualShock 4 controller with your iOS devices and Apple TV. With those great controllers available to iPhone, iPad and Apple TV users (which also work on PC or Mac and their respective consoles), why pay more for an MFi controller?

Nimbus, enhanced

The Nimbus+ is essentially an enhanced version of the excellent original Nimbus. It has the same excellent shape that will feel familiar to those who play on consoles, with twin sticks, a very clicky D-pad, A/B/X/Y buttons, a Home button, and

The ergonomics and button layout will feel instantly familiar to anyone who plays console games

shoulder bumpers and triggers. It's comfortable and lightweight, and feels well-made and sturdy.

New to the Nimbus+ is that the left and right sticks can be 'clicked' inward like buttons – a common feature to console game controllers these days. It also has Options and Menu buttons to the left and right of the Home button. Not strictly necessary for most iOS games, but nice to have.

Small holes on the back of the controller are provided to mount a detachable (and included) phone mount. It's extremely handy and does a great job of staying put. The springy collapsible grip holds an iPhone of any size, but is far too small for even the smallest iPad.

The included phone clip is handy, and really stays in place

SteelSeries says the battery lasts 50 hours, 10 hours more than the original Nimbus. I don't think I got quite that much battery life out of it, but I easily played for hours a day for a whole week without quite running out of power. If you're buying a controller to use with iPhone or iPad, you'll appreciate that it charges up via a Lightning port rather than USB.

Verdict

It's not that the Nimbus+ isn't an excellent controller. It is. It's essentially identical to the company's Stratus Duo, only with MFi certification instead of support for Windows and Android. It lacks rumble support, which is a let-down for

It's a great controller, but the Xbox One and PS4 controller support in iOS 13 have made it somewhat obsolete

console enthusiasts, but not a major feature of most iOS and Apple TV games. And that's one reason the controller is so lightweight and the battery lasts so long.

But it's just hard to justify the price. At £69.99, it's £20 more expensive than the original Nimbus, and £10 more expensive than either the DualShock 4 or Xbox One controllers. The phone mount is nice, but it's hardly worth paying more for. Given the limited ability to use the Nimbus+ outside of the Apple ecosystem, and fact that those console controllers have rumble feedback, gamers would just be better off buying a DualShock 4 or Xbox One controller and a separate phone mount clip.

This may be the best overall Apple-device-specific controller you can buy, there just isn't any need to buy an Apple-device-specific controller anymore. **Jason Cross**

Specifications

- Compatible with macOS, iOS and tvOS
- Official Apple-licensed wireless connectivity
- Lithium-ion rechargeable battery
- 150x110x63.3mm
- 243g

AVG AntiVirus for Mac

RATING: ★★★★☆

Price: **Free** from **fave.co/3OpLrwx**

Free third-party antivirus is often a trade-off. You receive only basic protection – a term that means different things to different companies – as well as semi-regular 'encouragement' to upgrade to a paid suite.

AVG AntiVirus Free for Mac offers very basic protection, but isn't too terrible about encouraging upgrades. The suite protects against viruses, secures your desktop email, your web browsing and that's it. Those are the essentials, however, which go a long way to keeping your computer safe.

AVG's protection is top-notch. AV-Test looked at it in December, and it had a 100 percent protection rate from 145 samples. AVG for
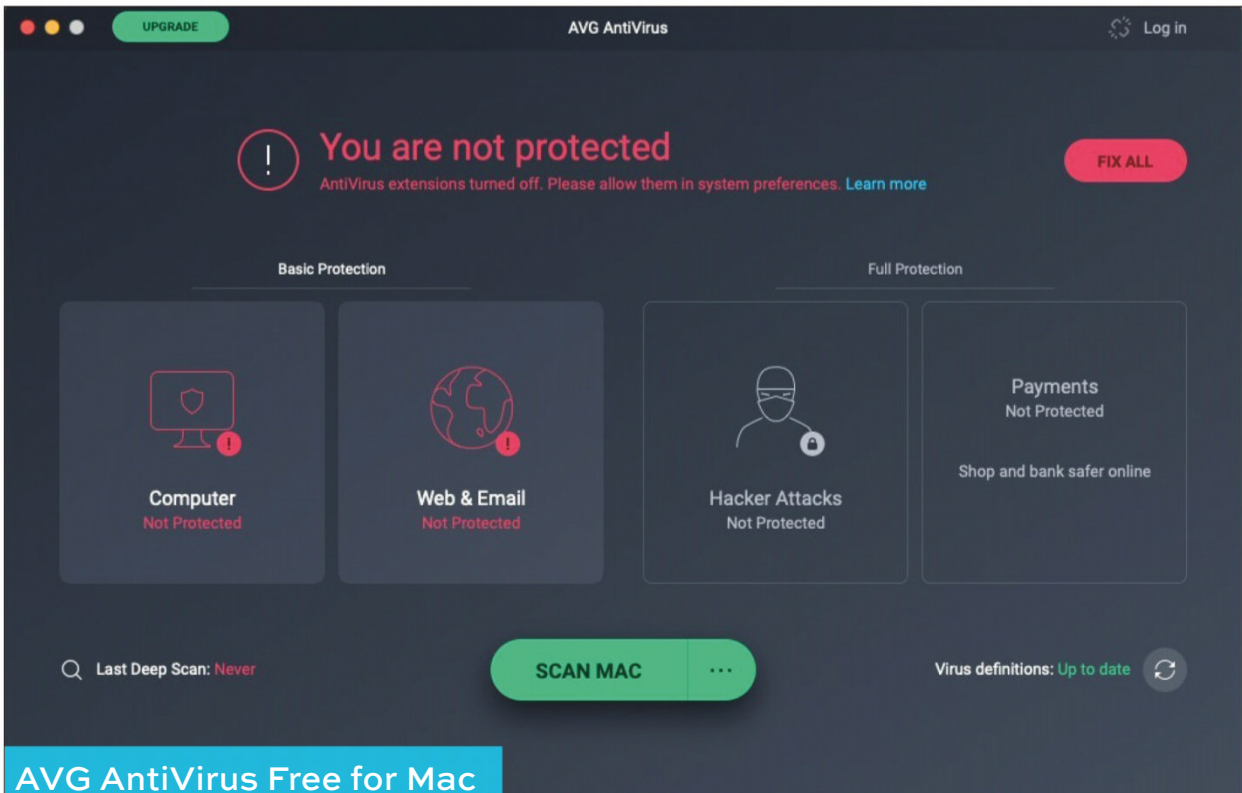
AVG AntiVirus Free for Mac when you first start the app

Windows had the same score from AV-Test's 0-day, web and email threats, as well as the widespread and prevalent malware test.

AV Comparatives' most recent Mac test was in June 2019. AVG for Mac also got 100 percent among 585 Mac samples, and 100 percent against 500 Windows samples in the same test. In our own spot tests, AVG did fine. It had no trouble blocking web-based threats, as well as a number of malware samples from the Objective See library.

Interface and features

When you first start up AVG Free for Mac you get a window with four tiles. Two of which are
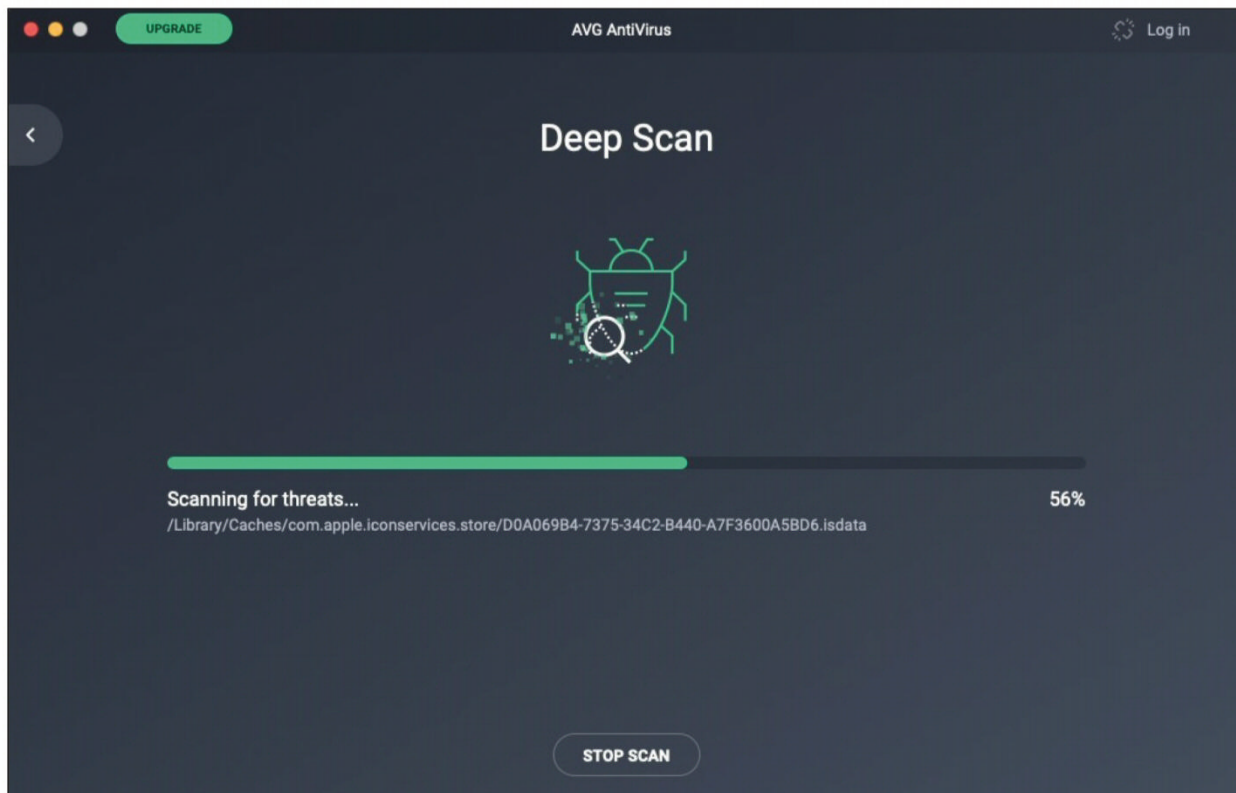
AVG's Deep Scan for Mac

labelled Basic Protection and the other two are Full Protection. The latter are for paid subscribers only and include ransomware protection, phishing protection, and a Wi-Fi inspector for monitoring all the devices on your home network.

Under the basic protection the two tiles are labelled Computer and Web & Email. Computer includes a file shield that automatically scans any new files added to your computer, and then the quarantine shows any detected malicious files. Web protection includes the ability to block web-based attacks and unsafe downloads, and then there's the email shield for desktop email programs that scans for unsafe attachments.

The tiles interface isn't really necessary for just the basic features. When you go into each section all you see are sliders that turn the aforementioned features on or off.

The top of the main dashboard includes the typical green, yellow and red warning system. When something is wrong with your system or something needs your attention, you'll see it easily here. If everything's all good the dashboard reads 'You have basic protection' lest you forget you haven't yet upgraded to AVG's premium features.

The lower part of the primary screen is reserved for scanning. The lower left indicates when your last scan happened, the lower right indicates if the virus definitions are up to date, and in the centre is the Scan Mac button. There are also three dots, which shows the three types of scan you can do: Mac Scan, Deep Scan and File Scan. The Mac Scan is just another name for a quick scan and looks at the most common places where malware hides. The Deep Scan is just that and File Scan lets you pick specific files or folders to scan. There's no option to drag and drop a file or folder for scanning, though you can right-click any file and choose Scan with AVG from the context menu.

Within the Preferences window there isn't much to tweak, but the Scanning tab is worth looking at. Here, you can set AVG to automatically scan external drives and shared folders, as well as automatically scan Time Machine backups.

For anyone who needs it Preferences > Exceptions tells AVG not to scan specific files or

AVG's scanning settings for Mac
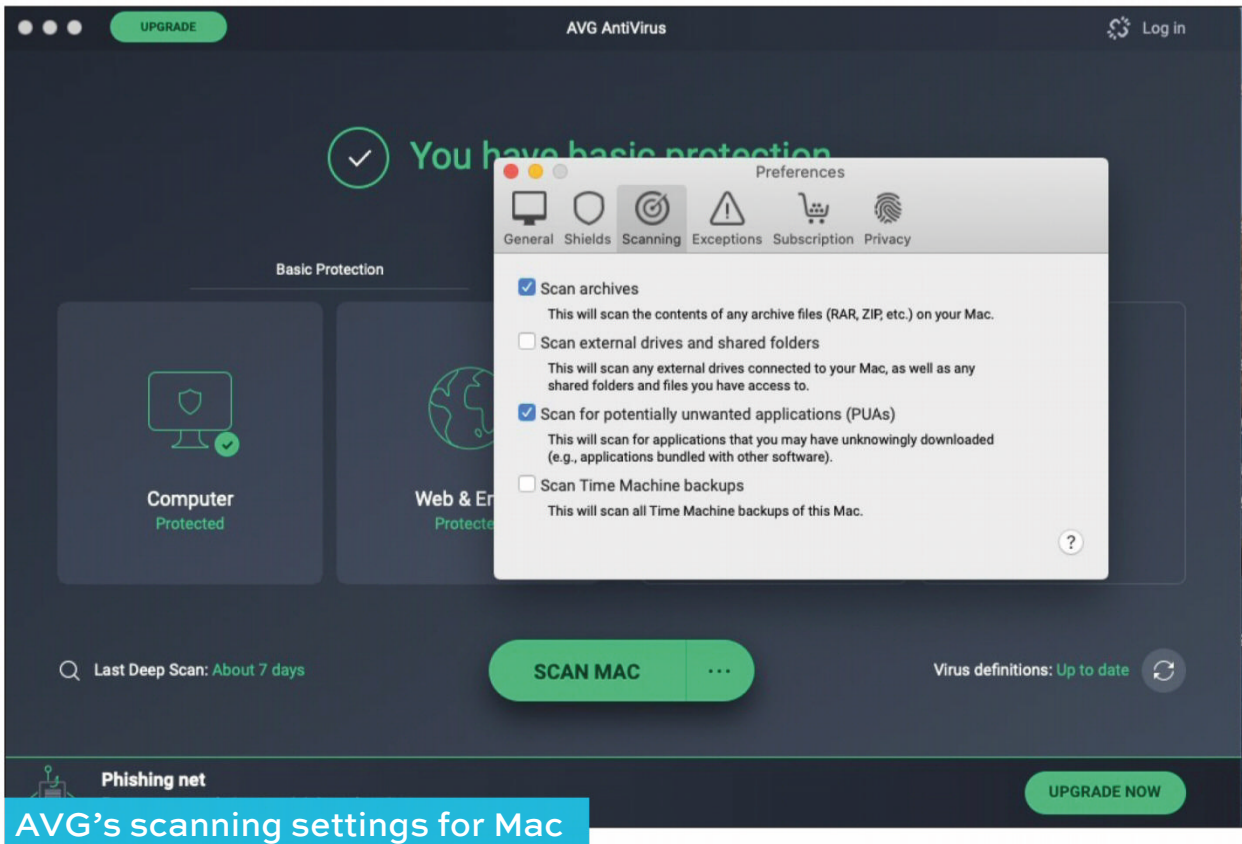
folders, which is handy if you deal with large media files that have little chance of being corrupted.

Verdict

It costs nothing and protection is top-notch, what more could you ask for? Well, you might want ransomware protection and the phishing protection is also important – especially if you're prone to click on links you shouldn't in email, social media, or a chat window. Upgrading to AVG Internet Security costs £49.99 for a year for one device or £74.99 per annum for up to 10 Macs.

For those who don't want to pay extra, AVG isn't too bothersome with its upgrade offers, though

you can't miss them when you look at the primary window. If you're looking for solid protection with basic antivirus features, then AVG AntiVirus for Mac is a good choice. **Ian Paul**

Major security flaw found in Thunderbolt Macs: Should you be worried?

A series of vulnerabilities in Thunderbolt 2 and 3 can leave your Mac open to hacking. **Jason Cross** reports

Security researcher Björn Ruytenberg with the Eindhoven University of Technology recently published a report (**fave.co/37o2QqT**) detailing a series of serious security vulnerabilities in Thunderbolt 2 and Thunderbolt 3, collectively called 'Thunderspy'.

They affect every single computer with a Thunderbolt 2 or Thunderbolt 3 port, including

old-style port connectors and new Type-C connectors, whether the computers are running Windows, Linux, or macOS.

How badly does this security flaw impact Mac users? Should you worry about someone hacking into your MacBook the next time you get up from your desk to refill your coffee?

Seven Thunderspy vulnerabilities

Ruytenberg describes seven vulnerabilities in his paper. They are as follows.

1. Inadequate firmware verification schemes.
2. Weak device authentication scheme.
3. Use of unauthenticated device metadata.
4. Backwards compatibility.
5. Use of unauthenticated controller configurations.
6. SPI flash interface deficiencies.
7. No Thunderbolt security on Boot Camp.

It's beyond the scope of this article to get into exactly what each of these mean and how they can be exploited to breach systems with Thunderbolt ports. Just know this: Macs are only susceptible to vulnerabilities 2 and 3 when running macOS, and even then only partially so. Running Windows or Linux on your Mac using Boot Camp makes you vulnerable to all of them.

How you could be hacked

The good news is that it would not necessarily be easy for a hacker to break into your Mac with these

exploits. They have to have physical access to your computer and a prepared Thunderbolt hacking device. These sorts of vulnerabilities are often called 'evil maid' threats. They require the attacker to have unimpeded and undetected access to your computer for at least a few minutes. It's highly unlikely someone would be able to take advantage of these exploits if you closed the lid of your MacBook and stepped away from it for a minute in a coffee shop. The worst of these vulnerabilities can happen while your Mac is in sleep mode, but not while it is powered off.

Intel has issued a statement about these threats.

"In 2019, major operating systems implemented Kernel Direct Memory Access (DMA) protection to mitigate against attacks such as these. This includes Windows (Windows 10 1803 RS4 and later), Linux (kernel 5.x and later), and MacOS (MacOS 10.12.4 and later). The researchers did not demonstrate successful DMA attacks against systems with these mitigations enabled. Please check with your system manufacturer to determine if your system has these mitigations incorporated. For all systems, we recommend following standard security practices, including the use of only trusted peripherals and preventing unauthorized physical access to computers."

The real worry here is for Boot Camp users. When in Boot Camp, Apple has the Thunderbolt controller set to security level 'none' (SL0), which
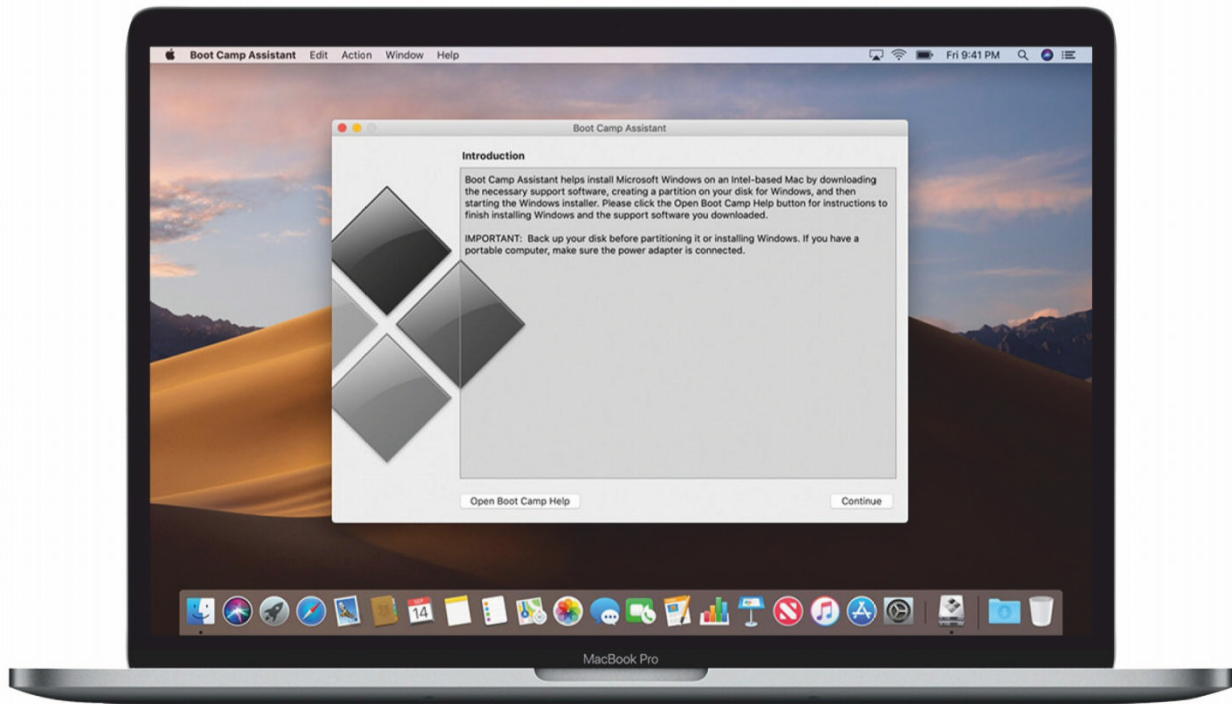
Apple has the Thunderbolt controller set to security level 'none' (SL0) in Boot Camp, which is a real concern

means a hacker with access to your computer running Boot Camp could easily access the contents of RAM or your hard drive, bypassing the lock screen.

For those running macOS, make sure you have updated to at least macOS 10.12.4. If you have, the practical dangers of the Thunderspy vulnerability are pretty narrow. If your version of macOS is older, a hacker with physical access to your Thunderbolt port could potentially copy contents of RAM or storage.

Even with a fully up-to-date macOS, a hacker could make a Thunderbolt device that copies the legitimate security ID of an officially supported

device, and then use it to execute some port-based attacks similar to what hackers can do on USB ports. Those tend to be slow and limited in scope compared to directly accessing the contents of your RAM or storage.

What you should do

Ruytenberg has suggested a number of things Mac users can do to help protect themselves:

- Connect only your own Thunderbolt peripherals. Never lend them to anybody.
- Avoid leaving your system unattended while powered on, even when screen locked.
- Avoid leaving Thunderbolt peripherals unattended.
- Ensure appropriate physical security when storing your system and any Thunderbolt devices, including Thunderbolt-powered displays.
- Consider using hibernation (Suspend-to-Disk) or powering off the system completely. Specifically, avoid using sleep mode (Suspend-to-RAM).

If you use Boot Camp to run Windows or Linux on your Mac, make sure it is powered down whenever it's unattended. If you're just running macOS, make sure you have updated to the latest version of macOS and exercise the same precautions about Thunderbolt devices as you should about USB devices. If you don't know where a Thunderbolt device has been, don't plug it into your Mac, and don't leave your Mac turned on (even if locked) and unattended where people can access it.

Should you be worried?

Most Mac users should not be terribly concerned about this particular security vulnerability. If your macOS install isn't way out of date and you're practicing good physical security (don't leave your Mac turned on and unattended, don't plug in devices if you don't know where they've been) you don't have a lot to fear from this avenue of attack. Remote attacks that use Wi-Fi or Bluetooth, or attempt to infect your computer with software downloaded over the Internet, are vastly more common than attacks like these that require physical access to your computer.

Users who run Boot Camp, especially in public places, should be particularly careful. When running Windows or Linux via Boot Camp, the Thunderbolt port on a Mac is more or less wide open. We can probably expect Apple to issue a software update to make Boot Camp more secure in the near future. If you have to use Boot Camp, you should fully shut down your Mac whenever you leave it unattended.

When running Windows or Linux via Boot Camp, the Thunderbolt port is more or less wide open

Apple's 'biggest update' to Logic Pro X in years brings Live Loops

Live Loops finally comes to Logic Pro X. **Michael Simon** reports
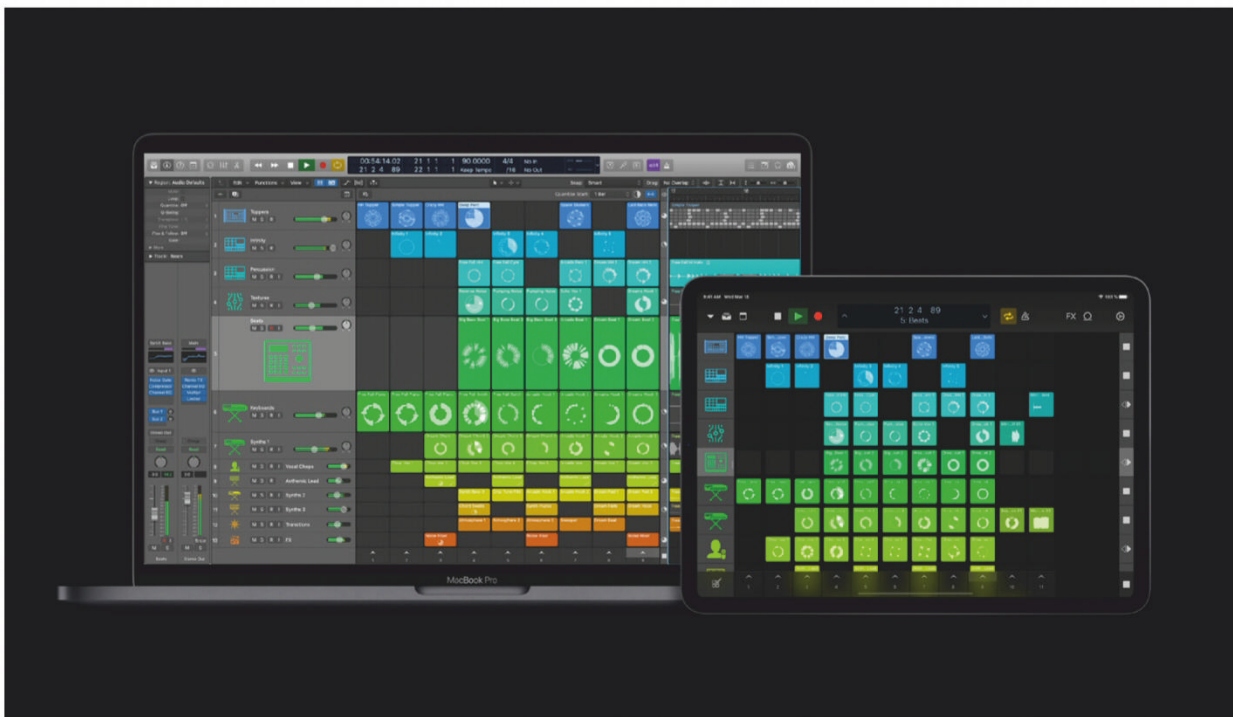
Apple has unveiled what it's calling "the biggest update to Logic since the launch of Logic Pro X" in 2013, bringing it more in line with GarageBand while also adding powerful sampling, sequencing and editing tools.

Most notably, the X.5 update brings, according to Apple, "a professional version" of GarageBand's

Live Loops that debuted in January 2016. As one of GarageBand's most popular features, Live Loops let musicians 'play, edit, and arrange musical ideas in real-time' by either selecting from a library of instruments and pre-recorded cells or creating their own sounds. Live Loops works the same on Logic Pro X as it does on GarageBand, though Apple says tracks can be "further refined using all of the professional production features in Logic".

To complement Live Loops, Apple is also rolling out a feature called Remix FM, which it says: "enhances Live Loops with an exciting collection of electronic effects like Bitcrusher, filter, gater and repeater that can be performed in real-time over individual tracks or the entire song mix." Furthermore, new sampling tools let sound designers 'turn any individual sound into a playable instrument', while a new step sequencer and drum synthesizer provide precise control over 'note velocity, repeat, gate, skip, playback direction, and randomization'.

In addition to optimizations for the latest Mac hardware and the power of macOS, Logic Pro X.5 also brings 'a major update' to Logic Remote, the free iOS companion app that lets iPhone and iPad users trigger certain Logic features and instruments using the touch-screen on their mobile devices. The update includes the ability to fully control Live Loops and remix FM.

However, for iPad Pro users, that won't be enough. While Apple has been slowly adding features and capabilities to the iPad to bring it
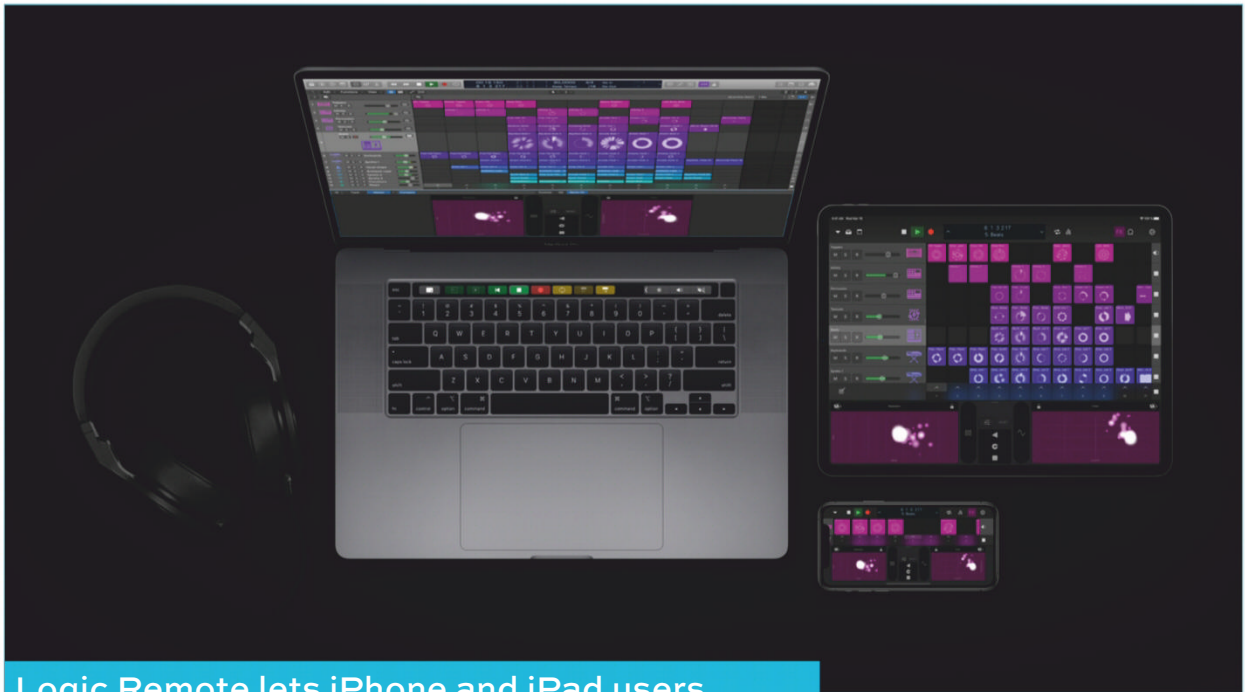
Logic Remote lets iPhone and iPad users trigger certain Logic features and instruments using the touch-screen on their mobile devices

more in line with the Mac – most recently with the addition of trackpad support – it still lags Apple's PC environment with support for so-called 'pro' apps, namely Logic Pro X, Final Cut Pro X and Xcode.

Macworld

FROM IDG

MAY 2020

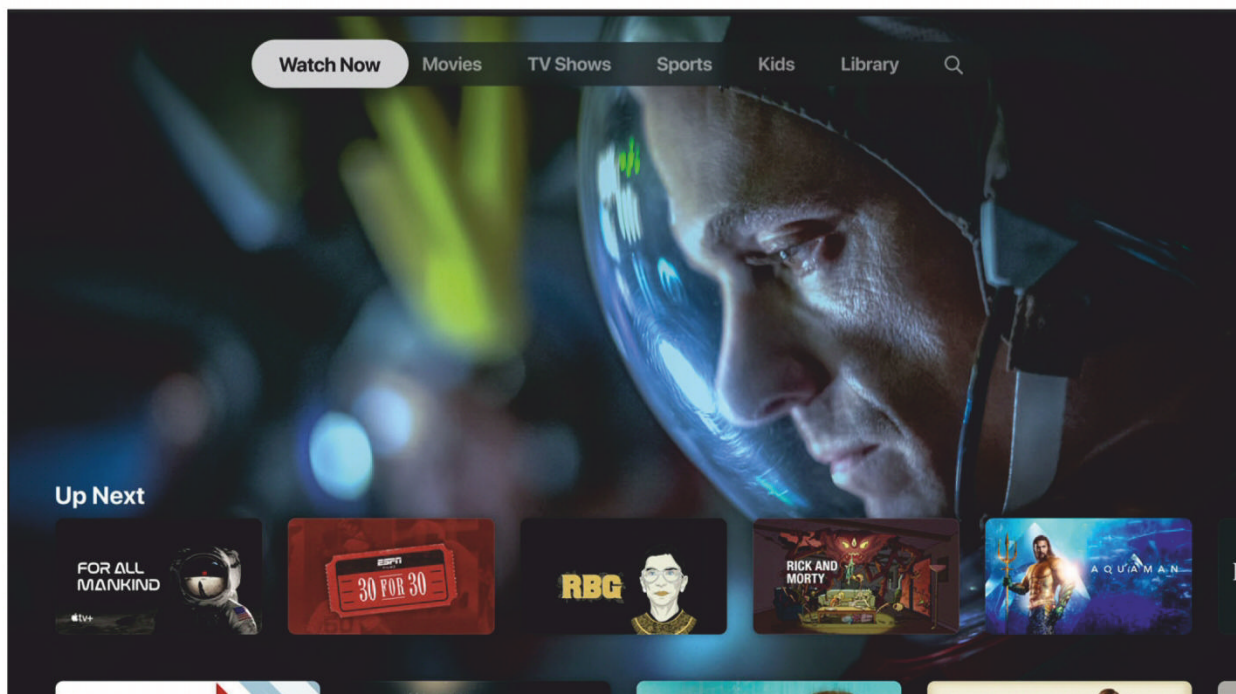# ULTIMATE GUIDE TO WORKING FROM HOME

PLUS:
APPLE UNVEILS NEW
MACBOOK AIR & iPAD PRO

Apple TV+ six months on: How has the streaming service been performing?

It's been half a year since Apple launched its video streaming service. Consider this a half term report. **Jason Cross** reports

n the spring of 2019, Apple took the wraps off the service we all knew was coming: Apple TV+. It clearly had designs on competing with Netflix, Amazon, Disney+, and the rest of the market. The first handful of shows were available on 1 November 2019, and a new show or movie has been released every few weeks since then.

So how is Apple doing? Half a year in, is Apple TV+ a must-have streaming service, or can you ignore it without missing much? So far, Apple has landed somewhere in-between. If we were giving Apple a letter grade, it would get a 'C' with a special teacher's note: 'shows potential'.

Apple is doing as well with overall content quality as any of its competitors, has expanded the TV app to more devices, and is priced competitively at £4.99 per month. But content volume is severely lacking, and the service hasn't found it's break-out hit yet.

The best shows arrived early

The milquetoast early marketing for Apple TV+ shows had us worried. They looked slick, but tame. It appeared as though Apple would spend a lot of money to make shows that slavishly avoided sex, violence, and profanity to the point where they had no edge at all.

Fortunately, the opening salvo of shows proved us wrong. While Apple TV+ shows seem to go out of their way to avoid nudity, there's no lack of foul language, violence, sexual situations or adult themes in the programmes where such things are warranted. The shows that premiered on 1 November are some of the service's best: *For All Mankind*, *The Morning Show*, *See*, and *Dickinson* are all worth your time. They're creative and engaging and not at all safe and boring. The kids' shows have been a little more lacklustre, but I admit I'm not the target audience.

Apple TV+ debut shows, like *The Morning Show*, are still some of the best on the service
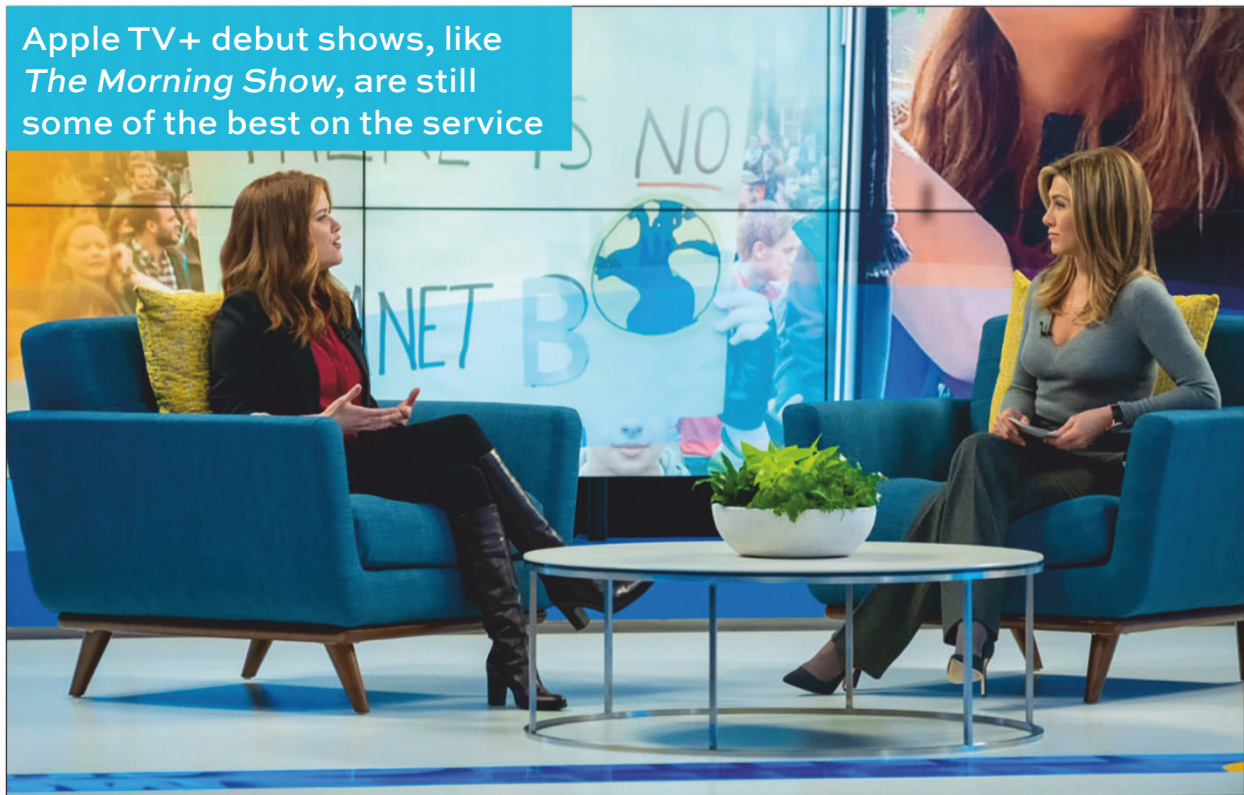
We had hoped Apple would keep the quality up, but the releases since November have been hit-or-miss. *The Little America* anthology and *Mythic Quest: Raven's Banquet* are more enjoyable than we would have expected, and *The Banker* is a snappy, well-paced film with good performances all around.

But just as many big shows have fallen flat. *Servant*, *Truth Be Told*, and *Home Before Dark landed* with a thud. Even Amazing Stories, a big-budget Spielberg production, feels decades behind our expectations for prestige TV today. The recent limited series Defending Jacob is well-made, but overstays its welcome and its positive buzz has worn off quickly.

We enjoyed *Mythic Quest: Raven's Banquet* more than we expected

Perhaps our favourite aspect of Apple TV+ shows is the way they are released. The Netflix 'whole season at once' approach is great for binging, but gives you little to look forward to and takes a show out of the limelight too fast. The Amazon and Disney+ 'one show a week' makes you wait too long, but keeps people talking – one season of *The Mandalorian* has dominated Twitter for a couple months. Apple's approach is a hybrid of the two where the first three episodes are released on the first day with the rest coming weekly. It lets you binge just enough to get invested, but still keeps you coming back and talking about it for weeks.

Breakout hits take time

Netflix may have struck gold with its first original series *House of Cards*, but it spent years as a

Defending Jacob is one of the better new releases on Apple TV+

first-mover streaming other content to build up to that point. In the US, Hulu took a lot of shots at original series before *The Handmaid's Tale* took off. Amazon's didn't exactly launch Prime Video with *The Man in the High Castle*, *Transparent*, and *The Marvelous Mrs. Maisel* out of the gate. Disney+ launched hot with *The Mandalorian* (aka The Baby Yoda Show), but we're talking about one of the world's biggest media empires with dozens of deep franchises. And Disney didn't exactly follow that up with a similar water cooler show.

The Apple brand carries sky-high expectations, deservedly so. Yet it's probably unreasonable to think this company would enter the premium streaming market and immediately deliver a slate of hits that sets the Internet on fire, month after

month, overtaking incumbents with years of content behind them.

Apple's biggest challenge is that it needs big hits in the way other streaming services don't. Apple TV+ is comprised solely of original shows and movies. There's no licensed content at all.

Netflix, Amazon, Disney+, Britbox, the streaming market is increasingly crowded, and every one of Apple's competitors has many thousands of hours of non-original programming to fall back on. Decades of proven hit TV and film content gives subscribers plenty to watch while they wait for the next big exclusive original. Apple TV+ has exactly none of that.

Look ahead to year two

A high-level look at the overall quality of Apple TV+ is positive. Certainly its mix of great, middling, and poor original content is no worse than rivals like Netflix or Disney+. Apple even has a couple shows that could break out into the broader Internet zeitgeist if the service grows just a little more popular.

But there's just not enough there, yet. With only original shows to lean on, Apple needs to kick out a new series or season every week to land enough 'must-watch' hits to keep subscribers coming back. Apple has a lot of irons in the fire, but the release schedule is just too slow when there's no licensed content to fall back on.

Fortunately, Apple seems to recognize that this first year is all about priming the pump.

Apple has a lot of shows in the works for its second year, including a *Ted Lasso* comedy series (pictured), *Foundation* sci-fi series and *Time Bandits*

The company made a bold move in offering any customer who buys an iPhone, iPad, Mac or Apple TV box a free year of Apple TV+. Family sharing included. That offer still stands, in fact.

This Christmas season, Apple TV+ will enter its second year. Its opening line-up will return for a second season, bolstered by more than a dozen other series and movies Apple has released during its first year. Just as the first of the free subscription years wears off, Apple TV+ should hit its stride.

Apple's £4.99 per month price is aggressive, but it's currently a tough sell when Disney+ is only £1 more and has a massive wealth of content, and competitors like Britbox have similarly-priced

plans. The current slate of Apple TV+ originals alone are not enough to justify a subscription, even at just £4.99. The competition is too fierce and subscription fatigue is setting in. But Apple doesn't need you to pay for Apple TV+ just yet. It just has to build up steam for a bigger second year, just when all those free subscriptions start to expire.

What will the ARM Mac line-up look like?

Chip transitions give Apple an opportunity to make major changes, like a redesigned iMac. **Jason Snell** reports

For a company with a reputation for sudden bursts of industry-shaking creativity, Apple's pretty conservative most of the time. The company has a years-long product pipeline, and while we're beginning to anticipate the 2020 iPhone, its hardware engineers are finishing work on the 2021 model while its

component designers are pondering the chips and sensors that will power the device into the mid-2020s.

For so many of Apple's product choices, a decision now is likely to be a decision that sticks for years to come. Think of how many years it took for the company to backtrack on the butterfly keyboard in the MacBook line, even after it was obvious that it had made a mistake. More to the point, consider the continued existence of the low-end, two-port version of the 13in MacBook Pro, which is largely the consequence of a failed attempt to replace the MacBook Air with the 12in MacBook and the entry-level MacBook Pro.

Some strong news reports suggest that in 2021, Apple's going to being a major reset of the Mac product line, thanks to its transition from Intel processors to its own ARM chips. After a decade and a half in which Mac product designs were often constrained by the Intel processor types that were available, Apple's got a chance to build a Mac product line exactly as it envisions it – right down to the right chips for the right computers. It's not an exaggeration to suggest that this will affect the shape of the Mac for the next five years, if not more.

What is Apple likely to do? I've got some ideas, informed by my observations of the last two transitions, a sense of where the Mac is today, and maybe a little bit of wishcasting.

The comfort of the iMac

I don't expect Apple to sweep away all familiar Mac models in 2021 just because it's changing

the processors that power them. Done right, the transition to Apple-designed processors should be barely a blip on the radar screen of the general public.

When Apple transitioned to Intel from PowerPC, the first product to make the transition was the iMac. The new Intel iMac looked more or less identical to the G5 iMac that it replaced. If you weren't aware that there was a chip transition underway, you might have missed it entirely. It took three years for Apple to truly redesign the iMac case, taking it from white plastic to silver aluminium.

What's different this time is that the iMac hasn't had a major design change in a long time, which suggests to me that this might be the perfect moment for Apple to change both the inside and outside of its iconic desktop Mac. It's possible that there will be an ARM iMac in the same case as today's models, but I don't think I would bet on it.

What does seem sure, though, is the continued existence of the iMac. It's been a core part of the

iMac Pro (left) and iMac

Mac for more than two decades. The iMac changes with the times, but it stays with us.

Stability of the professional Mac

It would stand to reason that the high end of the Mac product line will be the hardest spot for Apple's new chips to reach. Conventional wisdom is that Apple will start the transition with consumer tech and only spread to pro models later on. I'm inclined to agree with that assessment, at least for the first wave of new Macs. Keeping Intel compatibility and stability available to Apple's most demanding pro customers seems like a good idea.

The iMac Pro is getting a bit long in the tooth and could use a speed boost, but not a rethink. The

Mac Pro

Mac Pro just came out and seems to be built for the long haul. It's hard to see these models jumping to ARM soon. I'll throw the Mac mini in this category, too. While I'd love to see a reimagined Mac mini that's tiny and powerful and cheap, I suspect that the 2018 revision of the Mac mini will have to hold us for a few years to come.

Mystery of the MacBooks

That brings us to the big question: once it's free from the constraints of Intel's various mobile processor lines, will Apple rejigger its laptops?

I have to think that Apple will take the opportunity to do just that. It hardly needs three different 13in laptops. (Four, if you count the 12.9in iPad Pro when connected to a Magic Keyboard.)

So let's draw a four-square grid (see opposite), Steve Jobs style, with smaller and larger laptops for consumers and professionals. (Both groups could use some variety in terms of size, don't you think?)

On the consumer end, let's consider two new forms of MacBook or MacBook Air. A smaller 12in model takes the form of the old MacBook, but this time it's much more capable of running well without any fan. A larger model, perhaps a version of the 13in Air currently on sale, offers more robust cooling and a larger screen.

The A13 Bionic chip that powers Apple's current line of iPhones has six processor cores – two optimized for power and four optimized for energy efficiency. A chip with a similar configuration would instantly become the first six-core consumer Mac

	Consumer	Pro
Little	12-in.	14-in.
Big	13-in.	16-in.

Steve Jobs I'm not, but imagine a simpler Mac laptop line-up

laptop ever. (Let's also not forget Apple's built-in GPUs, which will probably put Intel's built-in graphics to shame.) In low-energy operation, these chips would sip power and maintain battery life, but when called upon, they could crank up those two 'performance cores'. It's hard to imagine that these laptops wouldn't be faster than the current MacBook Air, and with dramatically better battery life.

Then there's the MacBook Pro. As with Apple's pro desktops, I suspect that Apple's pro laptops

2021 might be the perfect time to retire the MacBook Air (pictured) and MacBook Pro brand names

will not make the move as quickly as the consumer models. But the path forward is pretty clear: a 14in laptop that's redesigned in the same way that the 16in model replaced the 15in last autumn. And then, ultimately, a new 16in model that's powered by a next-generation A-series chip that is truly capable of handing professional workloads. If the iPhone can have a six-core processor, what's to stop the MacBook Pro from having four or even six performance cores to go with four or six efficiency cores?

I've got no rumours or media reports to back up this particular supposition. I'm just looking at the imbalance in Apple's laptop line – one consumer laptop and three pro models. But while

I'm dealing in pure speculation, I'll throw out one final bit before I go.

Every time Apple has made a Mac processor transition, it's taken the opportunity to rename a portion of its product line. The PowerPC transition ushered in the Power Macintosh, replacing the Quadra. The Intel transition converted all Power Macs into Mac Pros and PowerBooks and iBooks into MacBooks.

So I'd like to suggest that 2021 might be the perfect time to retire the MacBook Air and MacBook Pro brand names and replace them with something simpler. How about MacBook and PowerBook? (We can reserve iBook for the iPadOS-based laptop.)

Perhaps that's a bridge too far. But chip transitions are funny things. They're an opportunity for Apple to take stock... and change course. I can't guarantee that anything I've written here will come to pass in 2021, but I can guarantee that change is coming, and some of it will take us all by surprise.

Help Desk

Solutions to your Mac problems. **Glenn Fleishman** reports
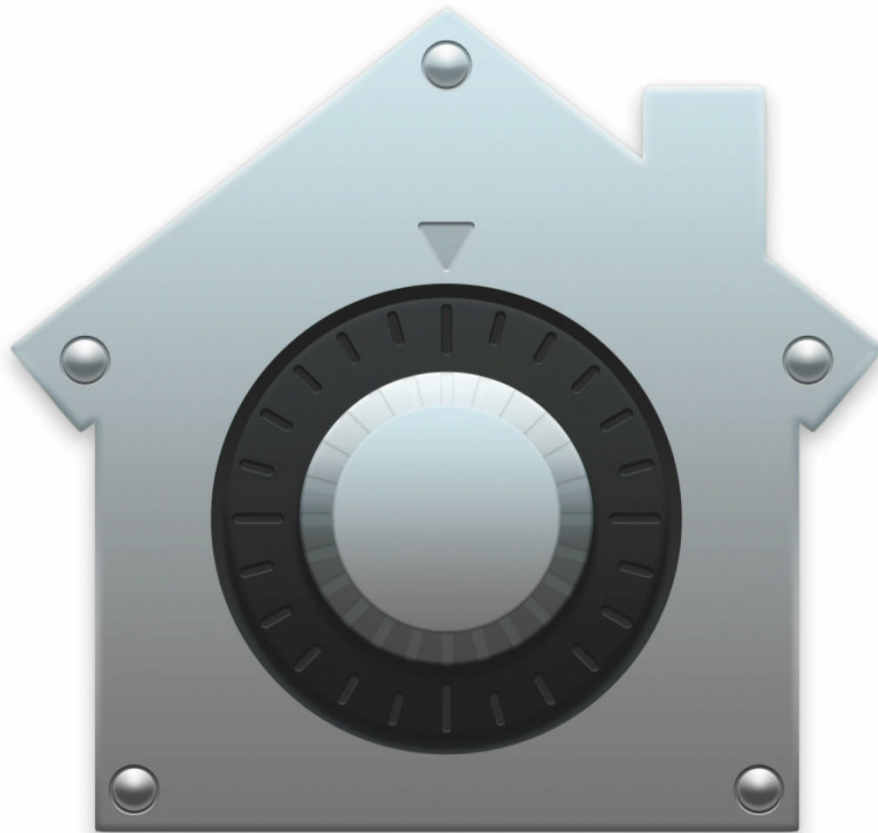
How to cope with a FileVault recovery key disappearing while you write it down

FileVault is an extraordinary bit of macOS technology. Introduced years ago, it encrypts the entire contents of your start-up volume so that when the data is at rest – when your Mac is powered down – the drive is effectively full of garbage nonsense to anyone who doesn't possess either the password to an account authorized to log in via FileVault or the special recovery key set when you

turn FileVault on.

When you use the Security & Privacy preference pane's FileVault tab to enable this encryption, macOS prompts you with two choices:

- Allow my iCloud account to unlock my disk
- Create a recovery key and do not use my iCloud account

In both cases, a recovery key is set. However, if you use iCloud to store your key, you never see it, and Apple manages the recovery process. All you need is your iCloud password and, if you turned on two-factor authentication, a trusted device or access to a trusted phone number. But this introduces risk, as someone who obtained your computer and discovered your password could potentially unlock the drive, too.

I prefer the second choice, as it provides entirely 'local' control. No secret is stored remotely. You only face a problem if you forget the passwords to all macOS accounts approved for FileVault-based cold start logins and you lose your recovery key. (I have heard of cases in which account information becomes corrupted, though, and the recovery key is the only way to start up a Mac.)

No record of recovery key

What happens if, while you're trying to write down the recovery key, it disappears from the screen? While this seems unlikely it happened to one reader, who doesn't believe they clicked a button
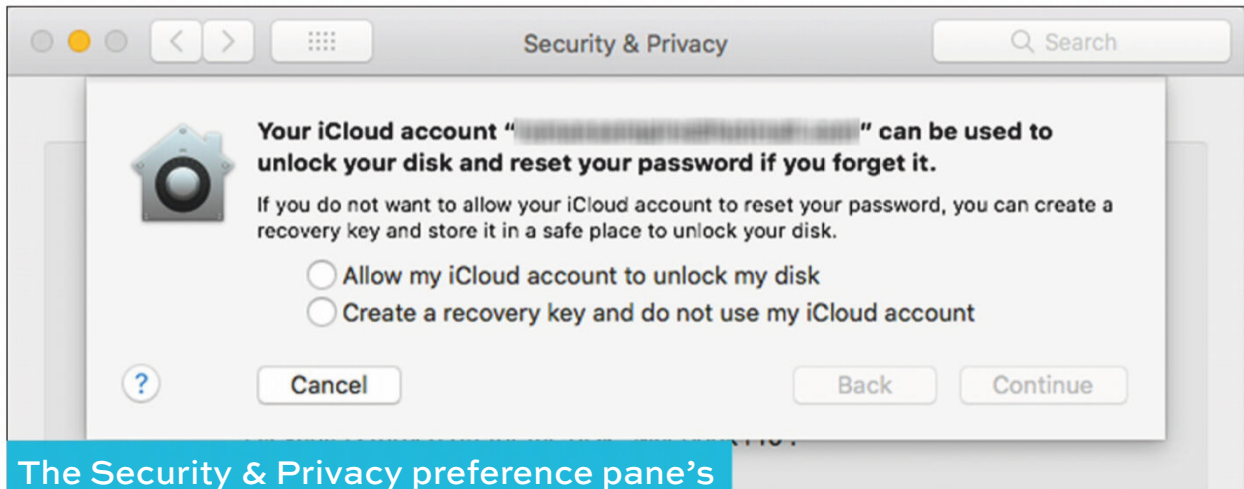
The Security & Privacy preference pane's FileVault tab gives you two choices.

or otherwise caused the key message to dismiss. They wrote in to ask how they could recover the recovery key?

Unfortunately, there's no method to retrieve the key once it's been displayed and dismissed. The recovery key is generated and passed through a strong one-way encryption process; only the result is used to further protect the keys used in FileVault encryption. The recovery key is displayed once. When you dismiss the dialog, macOS tosses this original version of it forever. (Entering the precise original recovery key, which is fed through the same one-way process, unlocks the data that it protects.)

If you weren't able to write the key down before it disappeared from view, you have to disable FileVault encryption and re-enable it to generate a new recovery key:

1. In the Security & Privacy system preference pane, click the FileVault tab.

2. Click the lock icon at the lower-left corner and enter an account name and password with administrative access.

3. Click the Turn Off FileVault button.

4. Confirm you want to disable FileVault by clicking Restart & Turn Off Encryption.

5. Your Mac now restarts. After you log back in using an account with FileVault permission, macOS begins decrypting the entire contents of the drive. This can take quite a while.

6. When decryption is complete, you can return to the FileVault tab and click Turn On FileVault.

7. At the Recovery Key prompt, choose the 'Create a recovery key' option and write the key down. You might even quickly take a picture of it as a backup. (But be sure to delete that photo and then permanently delete it from the Recently Deleted album to avoid any chance of someone gaining access to it.)

8. Restart again and FileVault begins the slow process of encrypting the start-up volume once more.

How to enable Reader View automatically for websites in mobile and desktop Safari

Many websites (including this one) have sidebars, overlays, autoplaying video, and other distractions – as well as text in a size you may find too small to read. Reader View is Safari's way to override the parameters most sites have set to produce a simplified stream of text for which you can adjust the size.

You can enable Reader View easily enough:

- In macOS, if Reader View is available, a paragraph icon appears at the far left of the Location Bar. Click it.
- In iOS and iPadOS, a little A/big A icon appears at the far left of the location bar. Long press it to enable Reader View.

But you can also configure Reader View as a choice for a website.

In macOS, right-click the Reader View icon, and then select 'Use Reader View Automatically on

Safari for macOS let you select Reader View with a click and apply settings from the Location bar
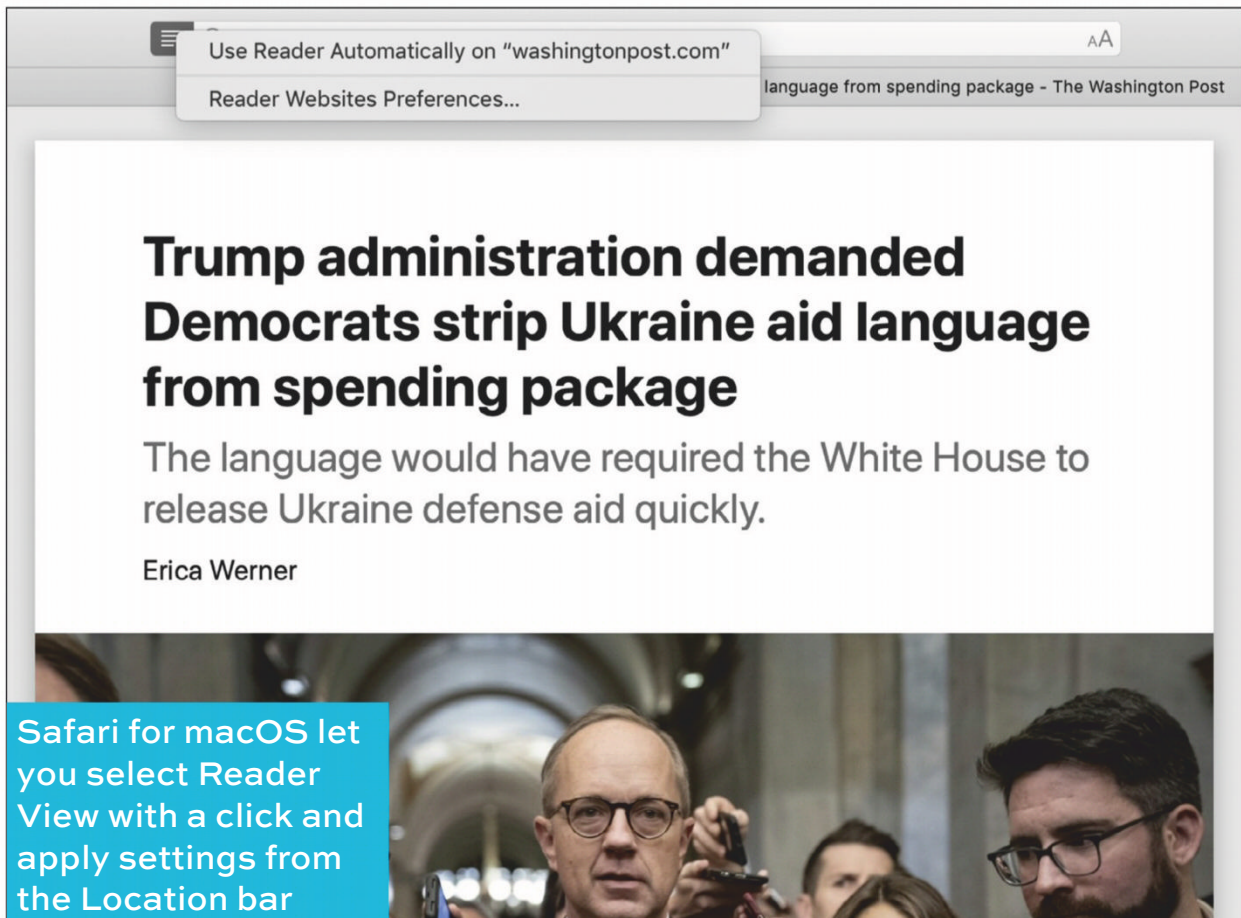
"site name"'. You can also select Reader Websites Preferences, which opens Safari's preferences dialog to the Websites tab and selects Reader in the left-hand features list. For any currently open or previously specified site, you can change the Reader behaviour via a pop-up menu. With any open sites, the pop-up menu choice immediately enables or disables Reader View in all tabs based on your selection.

In iOS and iPadOS, tap the Reader View icon and then choose Website Settings. This
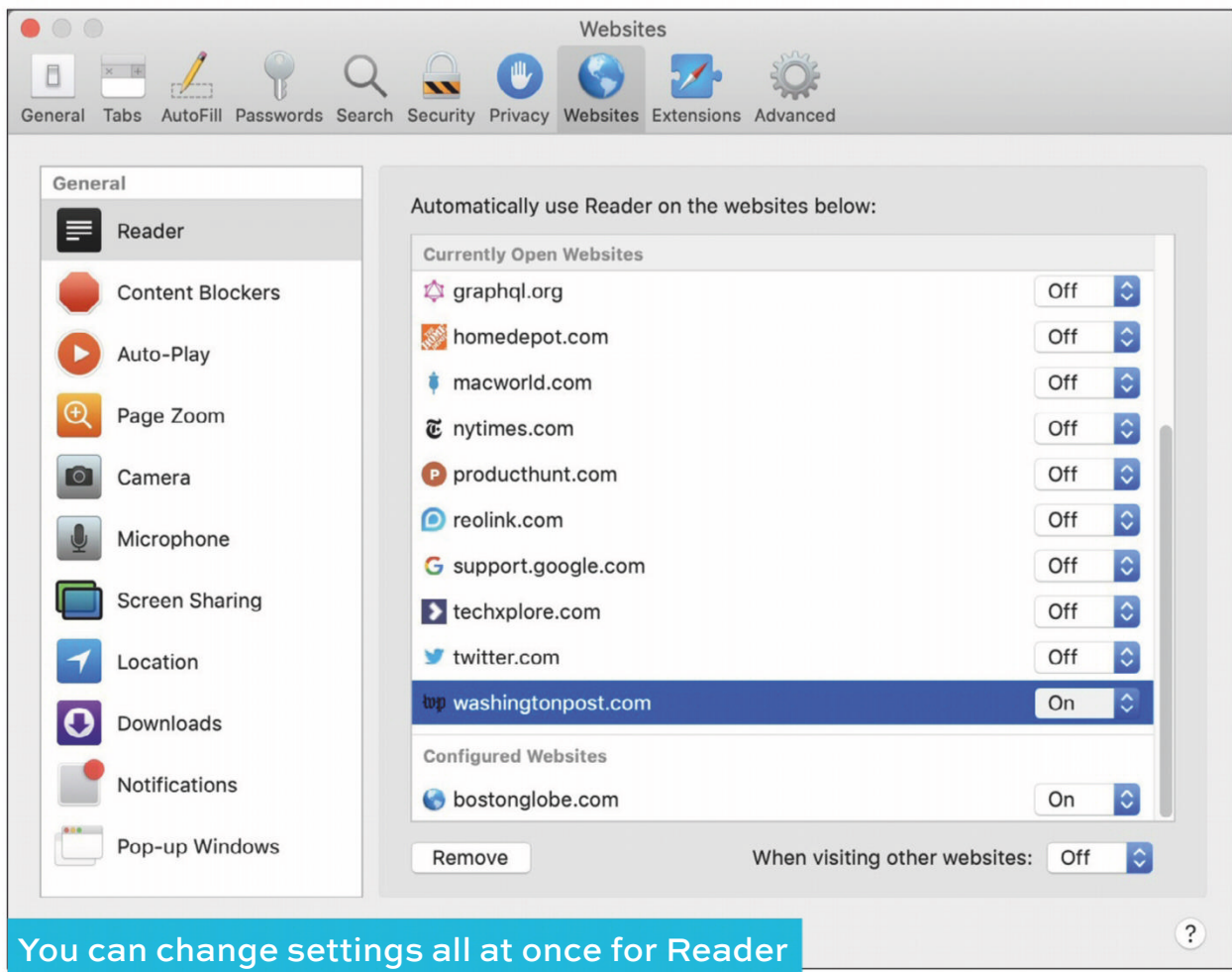
You can change settings all at once for Reader View in Safari for macOS's Preference

site-specific menu lets you configure multiple settings for the website, including turning on use Reader Automatically.

No matter how you engage Reader View, you can control the viewing size and other display parameters. In macOS, with Reader View enabled, click the small A/large A icon at the far right of the Location bar to choose a background colour and typefaces from several options. (With Reader View disabled, you can use the normal Command-plus (+) and Command-minus (-) keystrokes to enlarge or reduce the type size proportionately along with graphics. Press Command-zero (0) to return to the default.)

In iOS and iPadOS, tap the Reader View icon and tap the small A or large A to vary type size. This works for normal page view and in Reader View. In Reader View, you can also choose among typefaces and background colours.

How to use Apple ID to create passwords for your apps

Apple upped its account security for Apple IDs years ago to prevent unwanted and unauthorized third-party access to all your information. Apple relies on Apple ID across all its software and services, but third-party software can only gain access to three kinds of data: email, contacts and events.

Apple requires web-connected and native mobile or desktop software – on iOS, Android, Windows, macOS, and others – that want to use

any of those three kinds of data to use a special kind of access. You create a so-called app-specific password for each piece of software to which you want to grant access.

Google and other ecosystems offer a similar approach to reduce the opportunity for exploitation. Apple lets this password be used for email, contacts and events; some other systems require you lock it down to one of those three services, or even to a task as specific as 'retrieving email'.

To create an app-specific password, follow these steps:

1. Login to your Apple ID account in a web browser at **appleid.apple.com**. (You can only create and manage these passwords at the website.)
2. In the Security section, click Generate Password.
3. Enter a label to remind you on why you created the password and click Create.

Label your app-specific password so you can tell which one to revoke later, if you need to
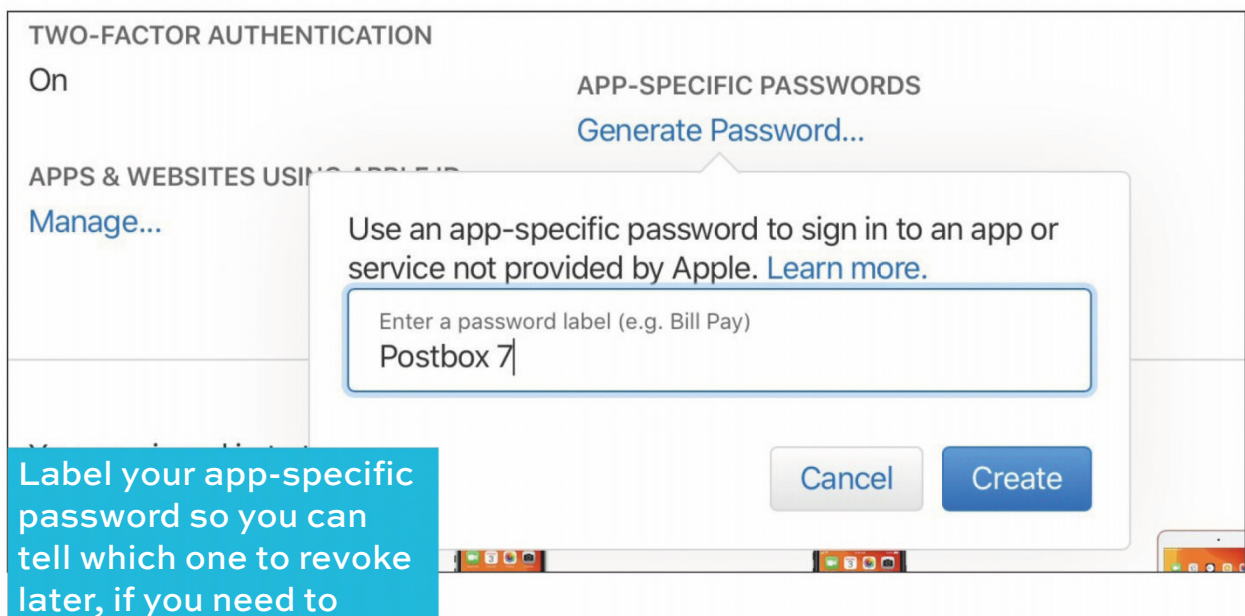
4. The site creates a password that you can write down or select and copy. Click Done.

5. In the third-party software you're using, enter your Apple ID email address and this password. No additional steps are required.

You can create up to 25 app-specific passwords. While Apple recommends you create one for each service or site, you can reuse them.

The utility of app-specific passwords is that you can revoke them without resetting your account.

1. Log in at the Apple ID site.

2. Click Edit to the right of the Security label.

3. To the right of the app-specific password generation link, click View History.

4. The site displays a list of passwords with labels and when they were created. Click the 'x' to the right of the listing and then click Revoke to remove it. You can also click Revoke All to deny access to all third-party apps if you believe something was compromised.
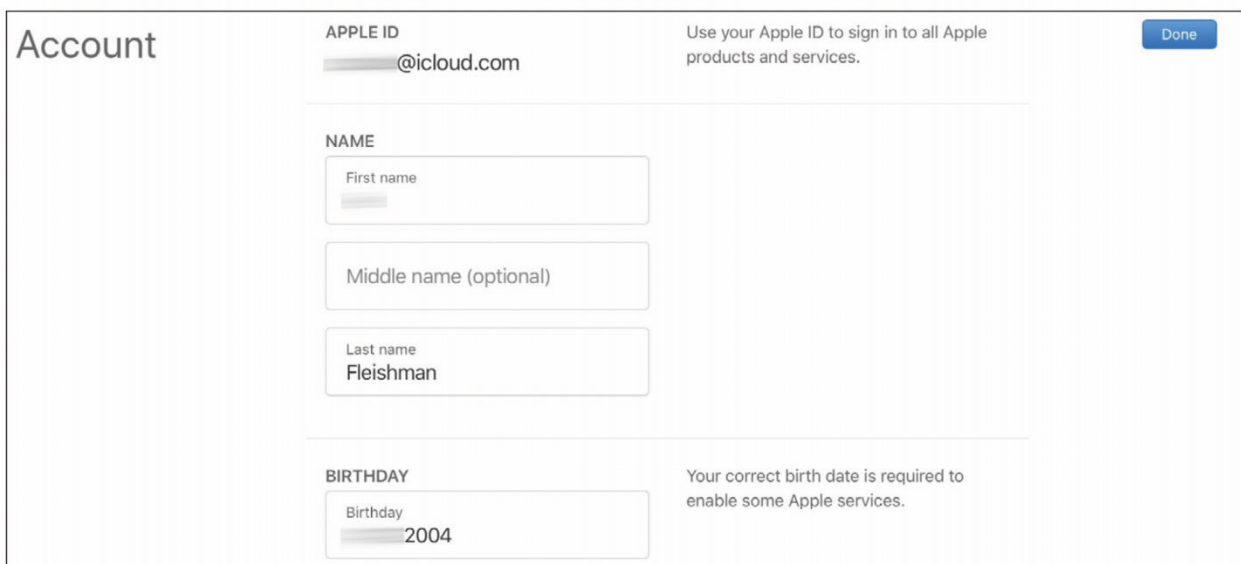
Treat these app-specific passwords with the same kind of care as you would your main iCloud password. Someone who gains access to your email can often use that as a scaffolding to access other parts of your life, such as sending password reset requests to the iCloud email address for other services, receiving second-factor login codes for financial institutions or confirming transactions via email.

How to change your child's adult Apple ID account to a child account

Let's face it: a lot of people may have created Apple IDs for their children's for convenience while skirting Apple's rules about the age at which an account can be created. That's 13 in the UK, unless you use the option within Apple's Family Sharing to create a Child Account.

If you weren't using Family Sharing, however, and – ahem – invented an earlier birth date for one or more child, you can still rewind the clock and gain the advantages for age-based control within Family Sharing.

For our family, that includes not just using Screen Time to limit and monitor access to all their Apple devices, but – and the children actually like this – remotely disabling Screen Time if they are on a sleepover or away on a school trip and we

You can update the birth date for a child's account if they mysteriously grew younger over the years since you first created it

are willing to let them use their screens past our household limits. (That was a selling point to at least one kid, along with access to a much larger pool of shared iCloud storage.)

First, add the child to Family Sharing, then simply log in using the child's Apple ID credentials at the Apple ID site, click Edit in the account section, and change the birth date. Click Done. If you return to the Family Sharing view on any parental Mac, iPhone, or iPad, the correct age is now listed.

ISSUE 155

iPad&iPhone user

FROM IDG

ESSENTIAL WORK FROM HOME APPS

PLUS:
THE TIPS AND TRICKS YOU NEED TO BOOST YOUR PRODUCTIVITY

FIRST LOOK:
iPAD PRO