M3 Mac launch dates - revealed!

› Issue 395 › October 2023
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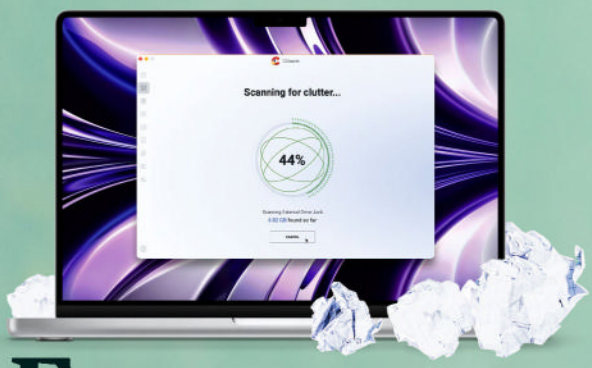
Mac FORMAT



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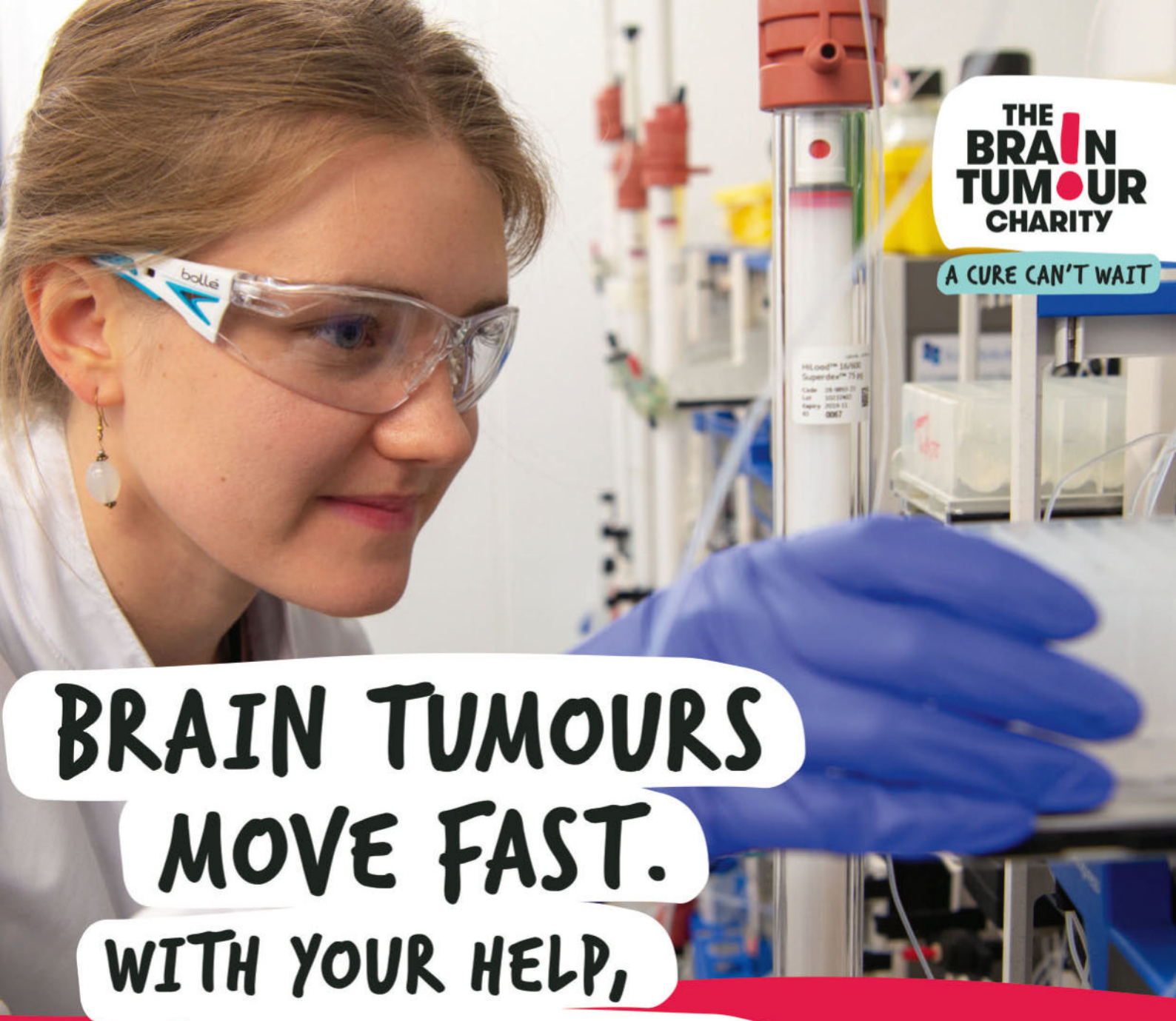

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It's amazing to think that almost half of all sales of Macs these days are to people who've never owned one before, but that's exactly what Apple revealed during its third quarter results in August. However, it's also not surprising – there's a halo effect around products such as the iPhone and AirPods that attracts people to other Apple products too. Plus, the company is on a tear right now; over the last nine months, it's launched new versions of the MacBook Pro, MacBook Air, Mac mini, Mac Studio and Mac Pro. And with Apple silicon going from strength to strength, the Mac is attracting growing numbers of upgraders too.

So whether you're a first-time buyer, a student heading to school or college, or a seasoned user switching up to Apple silicon for the first time, this month's lead feature (p20) will help. In it, you'll discover the great options available when it comes to picking your perfect Mac. And we've included some awesome apps and accessories too.

The only thing that might make you think twice is Apple's iMac. While its super-slim, colouful design remains attractive, it's also getting a little long in the tooth. Luckily, the Apple silicon inside is expected to get a refresh this autumn – you can find out much more on p8.

Enjoy the issue and see you soon!

ROB MEAD-GREEN
EDITOR
editor@macformat.com

Meet the team

Jo Membery
Operations Editor
› Jo's currently on her annual holiday where she's swapped her work Mac for a summer one. It's bright yellow and comes with matching galoshes...

Paul Blachford
Art Editor
› Paul's helping his kids get ready for Back To School season by making them do cross-country runs - to the shops and back in search of Pot Noodles.

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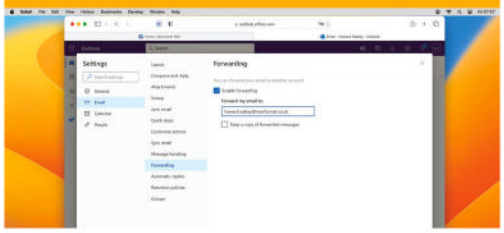

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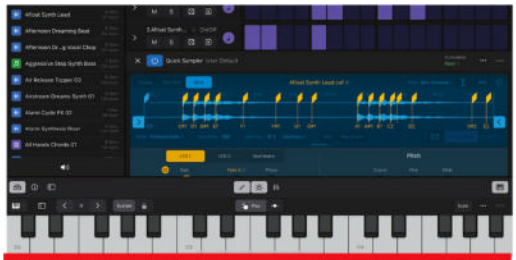

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APPLE CORE

EDITED BY **ROB MEAD-GREEN**

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HOT TOPIC!

Apple reportedly has AI chatbot in progress

GPT project is under way, but lacks clear direction

Sometimes it feels like artificial intelligence (AI) chatbots are taking over the world, with the likes of ChatGPT, Bing Chat and more stealing headlines daily. Amid all this cacophony, though, Apple has remained tight-lipped. Well, now we know why: it's allegedly working on its own chatbot that could one day compete with ChatGPT and others.

That idea comes from Bloomberg journalist Mark Gurman, a reporter with an impressive track record of leaking Apple's closely held secrets. According to Gurman, Apple has "built its own framework to create large language models" or LLMs. These are essentially the scaffolds that hold up AI chatbots. Internally, the tool is being dubbed 'Apple GPT'.

Siri could eventually gain AI superpowers, making it smarter and more responsive, if rumours prove accurate.

Apple hasn't made any public announcements around developing its own take on this sort of technology, and Gurman asserts that it was "caught flat-footed in the past year with the introduction of OpenAI's ChatGPT, Google Bard and Microsoft's Bing AI".

The company's reticence is thought to be due in part to concerns over privacy. AI chatbots such as ChatGPT have caused alarm among artists, writers and other creatives whose work has been harvested without permission in order to train the LLMs that power chatbots. As well as that, information you give to a chatbot could be used to send you targeted advertising and build profiles about you, which many might object to. Instead, Apple is apparently working out how to avoid those problems with its own chatbot.

Announcement next year

Apple has already infused machine learning-style AI into many of its apps and products, from Siri to Photos, but it doesn't have any kind of AI chatbot to compete with ChatGPT and others. But that could change with Apple GPT.

Interestingly, Gurman says that Apple's tool is already being used internally to help with product prototyping. "It also summarises text and answers questions based on data it has been trained with," Gurman says. However, it's unlikely that Apple GPT will be released to the

Image credits: Omid Armin, Unsplash

Siri could potentially benefit from 'Apple GPT' technology, as could many other Apple products and services.

Apple has already infused machine learning-style AI into many of its products

public any time soon. For one thing, Gurman says the tool uses a stripped-down interface and that "Apple has no current plans to release it to consumers".

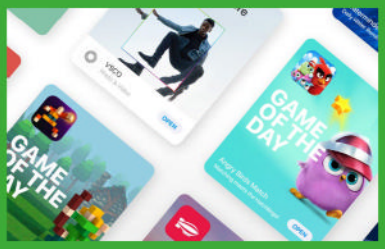
Besides that, Apple is reportedly unsure of the most attractive selling point for consumers when it comes to generative AI tools like ChatGPT. It is dabbling with a couple of different generative AI-based projects, Gurman contends, with a "significant AI-related announcement" planned for next year".

Siri, meet generative AI

Despite the uncertainty over Apple's plans, Siri could be a strong contender for an AI-based spruce-up. Google's own chatbot (called Bard) added the ability to read out answers to questions, and Apple might seek to do a similar thing to its own Apple GPT in order to produce a smarter Siri that can still hold conversations with users.

Tim Cook recently revealed that ChatGPT is something Apple is "looking at closely". The company has also posted numerous AI-related job listings, suggesting it is building a team of engineers to tackle this issue. Gurman claims Apple is worried about missing the generative AI boat, hence the newfound focus on Apple GPT.

While we might have to wait until 2024 for Apple to reveal more of its AI plans, it's unlikely the technology will immediately appear in Apple products. Renowned Apple analyst Ming-Chi Kuo said in July: "At present, there is no sign that Apple will integrate AI edge computing and hardware products in 2024."



Apple is working on how to help wearers of prescription lenses use its upcoming AR glasses, a new patent implies.

Apple's prescription for problem AR glasses

Aside from its newly announced Vision Pro, rumours allege that Apple is working on a pair of augmented reality (AR) glasses that will take a much more streamlined form factor than the bulky headset. One lingering question around this mooted device is how it will work for people who normally wear spectacles. Well, a new Apple patent has detailed an ingeniously simple potential solution to the problem.

The idea is that you could look at a distant, out-of-focus object while wearing the glasses, then adjust a dial on the device until the object comes into focus. This dial could even be on a separate device, such as the Digital Crown on an Apple Watch. It would mean prescription lens users wouldn't have to spend money on separate lenses in order to use the glasses.

Since this is just a patent, it's entirely possible that Apple won't ever put the idea into action. However, it's intriguing to see what could be a very elegant solution to a tricky problem.

Apple sued by App Store devs

Apple's long-running dispute with developers over its App Store fees has taken another turn, with a £785 million lawsuit being filed against the company in the UK. The class action suit, which represents more than 1,500 developers, argues that "Apple's charges to app developers are excessive, and only possible due to its monopoly on the distribution of apps onto iPhones and iPads".

The case has been filed by Sean Ennis, a former economist at the OECD, and further alleges that the charges are unfair and "constitute abusive pricing". It's a similar lawsuit to one currently being contested by Apple that seeks £1.5 billion in damages.

Apple's App Store troubles are not yet over, as the company is being sued by a group of developers in the UK.

› Image credits: Apple Inc, Alamy

APPLE NEWS ROUNDUP

APPLE'S BEZEL-FREE iPHONE PLAN

STILL SOME YEARS AWAY, THOUGH

› Over time, Apple has been thinning down the bezels on its iPhones. A new report from The Elec, however, claims the company is gearing up to make a completely bezel-less phone in the future, and is working with suppliers LG and Samsung to make it happen. They will need to work out how to hide electronic components – such as antennas and cameras – under the display, which could take years to perfect.

APPLE DESIGNING FOLDING iPAD

RUMOUR DETAILS ALLEGED DEVICE

› Apple's rivals may be sellling folding phones, but Cupertino wants to go one better and make a foldable iPad, according to a report published by DigiTimes. This backs up an earlier report from Apple analyst Ming-Chi Kuo, who said the firm was working on such a device that would launch in 2024. However, Apple has filed several patents for folding iPads, iPhones and Macs over the years, but there's no guarantee any will launch.

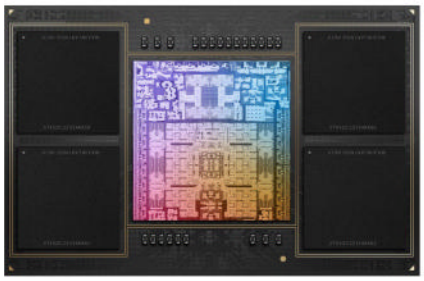
M3 Mac launch dates – revealed!

New iMac and MacBook Air models incoming, others may be delayed

Anyone waiting for an M3-powered iMac or MacBook Air right now – good news! You won't have much longer to wait. But for other models in Apple's line-up the picture's looking a little less rosy, thanks to production and other delays.

Of all the Macs in Apple's current line-up the 24-inch iMac currently has the oldest Apple silicon, sporting the same M1 chip it launched with way back in 2020. An October update should finally see it get the latest Apple silicon, along with the 13-inch MacBook Air and MacBook Pro models, suggesting Apple's lower-powered M3 chips will be rolled out first.

The new M3 chips will be based on a 3-nanometre process (3nm) and while precise details on the entire M3 family have yet to be revealed, the M3 Pro is said to feature a 12-core CPU, 18-core GPU and up to 36GB of unified memory.



Apple silicon could soon become even more powerful.

However, *The Wall Street Journal* reports that Apple's upcoming Arizona factory is struggling with a skilled labour shortage. The TSMC-run plant is due to produce 4nm and 3nm chips, the latter of which will find their way into future Macs. Without this expertise, the factory may not be able to produce as many chips as Apple needs – meaning fewer Macs for us to get our hands on.

Elsewhere, journalist Mark Gurman claims that Apple's 14-inch and 16-inch MacBook Pro laptops (which are expected to be powered by M3 Pro and M3 Max chips) may not launch until mid-2024, while an M3-powered Mac mini could arrive even later. While the former isn't too surprising – new versions of these laptops only launched in January 2023 – the far-off date for the Mac mini means a long wait for anyone who wants to upgrade.

Vision Pro could feature mood-altering AI content

Apple's Vision Pro headset is already being pitched as a device that can take you into another world, but that might gain a new meaning in future. That's because a recently unearthed patent shows Apple is considering how the next Vision Pro could be used to alter your mood.

So, if you're feeling upset and want to be cheered up, you could pop on the headset and let it get to work. Apple's patent explains that a Vision Pro could induce feelings of relaxation, happiness, even fear. It could all be controlled with a session on the device.

Apple states this could done by showing you types of content that prompt a mood change – if you're feeling agitated and want to relax, for example, the Vision Pro could show a hummingbird video.

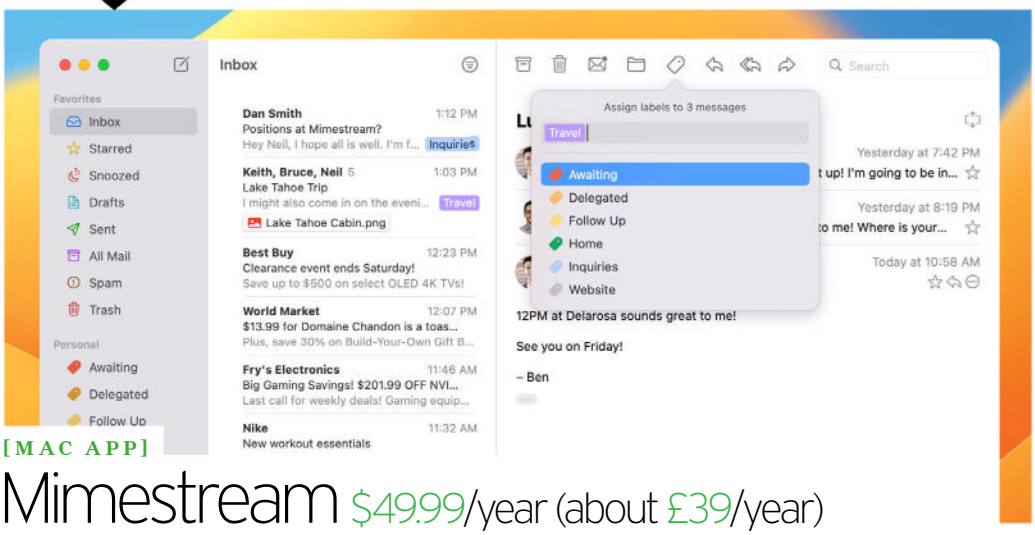
Despite the intentions of the patent, this feels futuristic,

In the future, the Vision Pro headset might be able to change your mood.

even dystopian. Perhaps Apple's been taking notes from Philip K. Dick's novel *Do Androids Dream of Electric Sheep?* in which a 'mood organ' modifies the emotions of anyone who uses it...

› Image credit: Apple Inc.

APP OF THE MONTH



[MAC APP]

Mimestream $49.99/year (about £39/year)

Gmail on your Mac done right

Gmail is one of the world's most popular email providers, but it's never felt properly integrated into macOS because, aside from using it with the macOS Mail app, you need to access it from a web browser – it's never had a standalone app of its own. Mimestream has now stepped in to fill the void, and it's everything you could want from Gmail on Mac.

It's built for Apple silicon and features a ton of familiar features, including swipe gestures, menu bar extras, and more. You can write with Markdown, use Gmail aliases, undo messages you've sent, and mention other users in emails. And if you have multiple Gmail addresses, you can incorporate them all into Mimestream.

There are plenty more features than we have space to list, but it's clear that this app is built with macOS in mind. If you're tired of managing your Gmail account from a web browser on your Mac (or via Mail), then Mimestream could be the solution for you.

[iOS APP]

(Not Boring) Vibes

FREE (offers in-app purchases)

The (Not Boring) series seeks to redefine popular app categories, and (Not Boring) Vibes is no different. It serves up personalised music made to improve your focus and concentration, and you can start quickly and easily. Just tell it what you need and it delivers a musical medley for the task at hand.

Why you need it: It's mood music that actually works.

[iOS GAME]

Daisho: Survival of a Samurai

£4.99/month (Apple Arcade)

Set in medieval Japan, Daisho: Survival of a Samurai is about mastering the art of strategy in a time of conflict and deception. As the daughter of a samurai, you must protect your home as a war rages, while bringing success to your village and exploring the world as you go.

Why you need it: Craft your legacy in a war-torn land.

[MAC GAME]

Dave the Diver

£16.99

Dave the Diver lets you explore the ocean and hone your fishing skills by day, then serve up delicious dishes at your sushi restaurant by night. With relaxing gameplay, beautiful art that merges 2D and 3D environments, and heaps of humour, it's a game that's making some serious waves.

Why you need it: Chilled-out fun and lots of laughs.

Media Picks

What you should be playing and reading this month

[ALBUM]

Speak Now (Taylor's Version)

Taylor Swift

£12.99

A refreshed version of the 2010 classic, *Speak Now (Taylor's Version)* sees Swift explore love, heartache and resilience from her early years as an artist.

[AUDIOBOOK]

The Satsuma Complex

Bob Mortimer

£12.99

Gary meets a girl in a pub, but after his friend disappears, Gary must track her down and get some answers. A hilarious comedy written and read by Bob Mortimer.

[PODCAST]

Fukushima

A dramatic retelling of the Fukushima disaster. 10 years after the devastating events, a young journalist explores the consequences for their country.

Image credits: Mimestream, LLC, Andy Works LLC, Colossi Games, MINTROCKET, UMG, Simon & Schuster UK, BBC

Crave

THE GEAR WE'RE LUSTING AFTER

Linn Sondek LP12-50

›From £50,000 › **From** linn.co.uk

› **This rather pricey turntable marks the 50th anniversary of possibly the most iconic product in hi-fi history.** For this important occasion, Linn has teamed up with LoveFrom – yes, as in ex-Apple Chief Design Officer Jonny Ive's creative design firm.

The LoveFrom collective's "respectful and gentle" expertise has ensured that the player comes with as much aesthetic appeal as possible without veering too far from the much-lauded 1970s original. You'll find precision-engineered aluminium hinges, a subtle yet funky power/speed button, and a Bedrok plinth formed of orthogonal layers of beech placed under pressure to create one solid chunk of material. There are only 250 being handmade in Scotland on a first-come, first-served basis. Which doesn't give any of us much time to raise the cash!

Each LP12-50 turntable comes with a batch number on the back to mark its place on the limited run.

›Image credit: Linn Products Ltd

Satechi T4 Multimedia Pro Dock

› $349.99 (about £327) › **From** satechi.net

› **Satechi describes its Thunderbolt 4 Multimedia Pro Dock as a powerhouse, and with 16 ports and 96W power delivery on offer, it's easy to see why.**

Made from high-quality aluminium with silicone rubber sides, the dock boasts two DisplayPort 1.4 ports, two HDMI 2.1 ports, seven USB ports, SD and microSD card readers, an in/out audio jack, and 2.5Gbps Ethernet. That 96W of power will sort a computer for a day and you can charge phones and tablets over two of the USB ports. You can add up to four screens at 4K 60Hz (depending on your computer's capabilities) and the SD and microSD card slots can be used simultaneously. Increase your creativity while keeping down the clutter.

Insta360 Go 3

› From £379.99 › **From** store.insta360.com

› **Insta360 is touting the Go 3 as the 'world's smallest action cam'.** The device has a thumb-sized camera which 'pops out' of the device's Action Pod battery charging body. The tiny cam weighs just 35g yet is capable of capturing crisp 2.7K video. As well as its charging capabilities, the Action Pod doubles up as a remote control and live preview flip touchscreen. The camera element is waterproof to 16ft (5m) while the Action Pod body is IPX4 splashproof. The cam features FlowState stabilisation, and the dedicated Insta360 app allows for AI editing of your footage.

Denon PerL Pro

› £299 › **From** denon.com

› **Denon is known for bigger bits of audio kit, such as home cinema receivers and multi-room audio.** But the PerL Pro is its first foray into the world of true wireless earbuds. Fortunately, these scaled-down audio offerings carry the company's familiar stamp of quality. The PerL Pro offer active noise cancellation (ANC), Bluetooth 5.3, aptX lossless and spatial audio, and you can perfect a personalised sound profile using Masimo Adaptive Acoustic Technology. The earbuds run for eight hours (plus 32 via the case), with IPX4 water resistance.

Nebula Mars 3

› £1,099.99 › **From** uk.seenebula.com

› **Billed as the world's first truly outdoor projector, the Mars 3 is certainly built to withstand a bit more al fresco existence than some other projectors.** It's rated at IPX3 water resistance, can cope with a 0.5-metre drop and offers a level of dust protection too. Aside from the more rugged build, you get an impressive 200-inch max screen size, 1,000 lumens' brightness and 40W Dolby Audio. There's also a particularly impressive 85Whr built-in power bank to provide you with a good five hours of garden cinema fun.

› Image credits: Satechi, Insta360 GmbH, Masimo, Nebula/Anker Technology UK Ltd

CONTACTS

Have your say on all things Apple!

Contact us

> Email your queries and your questions to letters@macformat.com

LETTER OF THE MONTH!

PRINTING BY NUMBERS

Thank you for highlighting the power of Apple apps Pages, Numbers and Keynote in your September issue (*MF394*). I'm an avid user of Numbers and Keynote, and present a lot of material, so I was extremely interested to discover your tips. However, one issue I haven't been able to overcome is the 'print highlighted section' that features in an Excel spreadsheet and seemingly not Numbers. Sometimes I only need/want to print or PDF a section of my data. Have I missed a trick or is this really a missing feature?

BY GARY WILLIAMS

ROB SAYS...

It really is a missing feature – and one we hope Apple addresses in the next Numbers update. The only thing you can usefully do is copy and paste the data you want to highlight into a new Numbers sheet, then print or save it as a PDF from there. It's a bit of a kludge, but it works.

NOTES ON AN iCLOUD BACKUP

I'm a bit of a sucker when it comes to notes apps, particularly those using Markdown like Obsidian and Logseq. Another joy of using these apps is that if we save the files to iCloud I can access them via the iOS apps. However, as I'm gradually transferring more and more of my notes across, I've realised I now store a lot of files on iCloud. This begs the question: should I be backing up this data, and if so, how?

I've read stories of iCloud losing people's data, so I presume it's not beyond the realms of possibility (even if it is an unlikely scenario). However, having a local backup would put my mind at rest – what's the best way to go about this?

BY SIMON WHALEY

ROB SAYS...

Apple's recommended solution is to select iCloud Drive in any Finder sidebar, select the files you want to keep a copy of, then from the Edit menu, select Copy Items and paste them into your new location. This could be to a different folder on your Mac that's not stored on iCloud Drive (the Downloads folder, say), or to an external drive.

You could then – if you wish – create a backup of that folder to a diferent drive using either TIme Machine or a third-party app such as SuperDuper (£26.90, shirt-pocket.com). The other alternative would be to use an online backup service, such as Backblaze (backblaze.com). Whatever you use, the key thing is to download the files from iCloud first – it's just a shame there's isn't a smarter way to do this automatically.

LOCKDOWN LOSS

I would be grateful for your help: I have a problem that occured after a macOS upgrade earlier in the year. The problem prevents opening attachments to web pages [see BBC webpage in the example below]. I've reloaded the OS but to no avail. The computer is an Intel iMac 27-inch running Ventura 13.4.1.

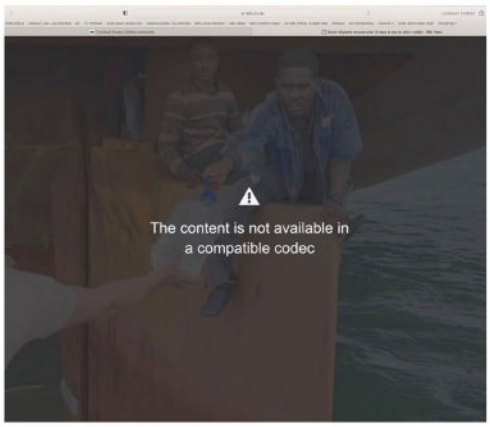
BY ROLAND HARRIES

ROB SAYS...

The screenshot you sent us shows a BBC web page with the message 'The content is not available in a compatible codec' across the middle. We haven't been able to replicate the same issue on the Macs we use here but, we noticed from the screenshot you provided, that Lockdown Mode has been enabled on your Mac.

This feature is designed to be used by journalists, dissidents and others who may be worried they're being targeted by bad state actors using spyware – so it's not for general use. Lockdown Mode massively increases the security of your Mac, but having it active can stop many perfectly normal functions from operating correctly.

Apple says in its support note: "Certain complex web technologies are blocked, which might cause some websites to load more slowly or not operate correctly." That appears to be the case here.



Running Lockdown mode on your Mac will increase its security but prevent some functions running properly.

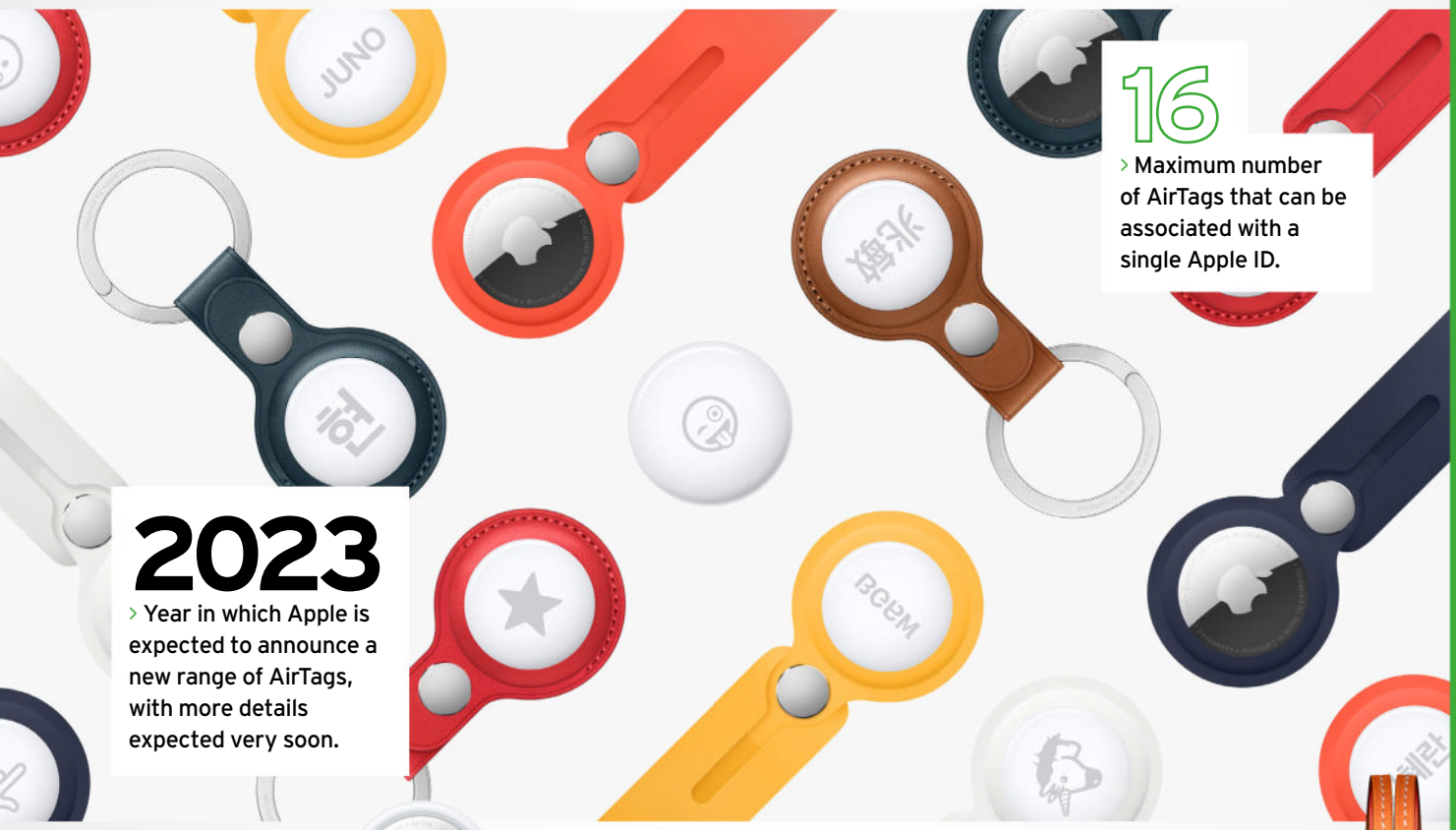
> Image credit: Microsoft Corporation, BBC

APPLE'S AIRTAGS NUMBERS

Apple's cute tracker tags do more than simply help you keep tabs on your belongings. They also make for some interesting statistical facts too...

£35

› Cost of a single AirTag from the Apple Store. An AirTag 4-pack costs £119.



16

› Maximum number of AirTags that can be associated with a single Apple ID.

2023

› Year in which Apple is expected to announce a new range of AirTags, with more details expected very soon.

1 year

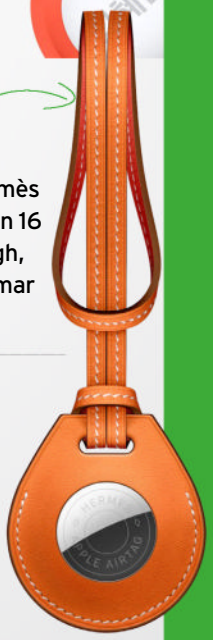
› Average lifespan of the replaceable CR2032 battery used in the AirTag. You'll receive a warning when the battery is running low.

240m

› Maximum estimated range of an AirTag's wireless signal, which uses Bluetooth to connect to nearby devices. In theory, an AirTag is trackable for hundreds of miles because of the way the underlying technology works.

£359

› Cost of an AirTag Hermès key ring. It is available in 16 different colours, though, including Beige de Weimar and Échappée.



£35

› Cost of an Apple AirTag loop, which is perfect for attaching to a backpack or handbag. Available in five colours including Sunflower.

15

› Number of iPhone models offering the AirTags's Precision Finding feature, thanks to its built-in U1 chip. Available for iPhone 11 through to iPhone 14.

› Image credit: Apple Inc, Hermès

MATT BOLTON...

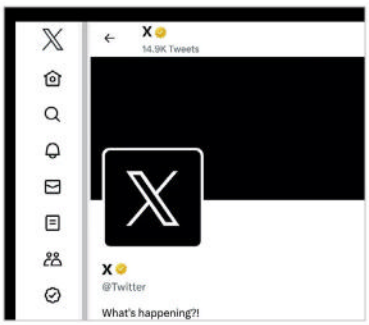
SAYS THAT IN THE CURRENT ERA OF TECH MADNESS, IT'S VERY WELCOME FOR APPLE TO BE A BIT BORING SOMETIMES

When I sit down at my fine mahogany desk and dip the quill to begin writing these columns – at my leisure, safe in the knowledge that the magazine's errand boy must wait in the rain until I'm good and finished – I'm obviously looking at the biggest tech stories around as a starting point for ideas, to see whether there's anything that'll affect us Apple users. And I'm looking at leaks and rumours about future Apple products to see if I have something to say about Apple's likely direction of travel, and what that tells us.

On a day like today, when the stories are all about what an incremental change the Apple Watch 9 and iPhone 15 will be, and how Apple won't launch a folding phone for three years if it ever does, I'm not exactly filled to the brim with excitement. My instinctual response to this news is that I absolutely refuse to write a(nother) column about how Apple, and the tech world, isn't interesting anymore because all the 'new' tech is maturing. I have ploughed this furrow well in the past; we're all used to this new normal.

I find it unlikely Tim Cook will fight any other major tech luminaries in a cage

But then I flick past all the stories about how X (née Twitter) had to take down the sign on top of its building (put up due to the fact the old sign couldn't be removed because the company didn't have the permits) because it was brighter than the sun, or the latest update on the Elon Musk versus Mark Zuckerberg cage match, or about how the new cryptocurrency from the creator of ChatGPT (ooh, that's bingo!)... and I think "Good old boring Tim Cook. And good old boring Apple. Long may they stay this way."



While X (née Twitter) careers about like a drunk uncle at a wedding, Apple takes a sip of Kool-Aid and calmly carries on.

The tech world is coming off the rails. Perhaps it's due to the fact that large parts of it are funded by a venture capital system that demands giant growth no matter what's happening in real world. Maybe it's due to all the companies run by people who've never lived a normal day since college. Every day is delivering some fresh new source of "What!? Why!?"

I find it pretty unlikely that Tim Cook will attempt to fight any other major tech luminaries, in a cage or any other venue. Possibly at paintball, if you pushed me. I don't think the company will start ruining its own products so badly that we start begging Microsoft to make a clone of iOS we can jump to. I don't think we'll ever have to talk about how sometimes your iPhone creates hallucinations you have to ignore when you ask it for information.

The knock on Tim Cook used to be that he isn't Steve. The praise for Tim Cook now is that he isn't Elon.

I *am* of the opinion that we have to be realistic about what kind of leaps we can expect from affordable consumer tech products in the next few years – not from stuff at Vision Pro prices, where things can still get spicy, but at iPhone or AirPods prices. Nice updates come, but they don't come all at once to change the game – we've reached a plateau. And when I'm in the middle of it, watching all these companies swerve right over the edge of the cliff, the plateau seems very nice thank you.

ABOUT MATT BOLTON

Matt is Managing Editor at *TechRadar.com*, and previously worked on *T3*, *MacLife* and *MacFormat*. He's been charting Apple's ups and downs since his student days, but still hopes to hear "one more thing".

Image credit: Apple Inc

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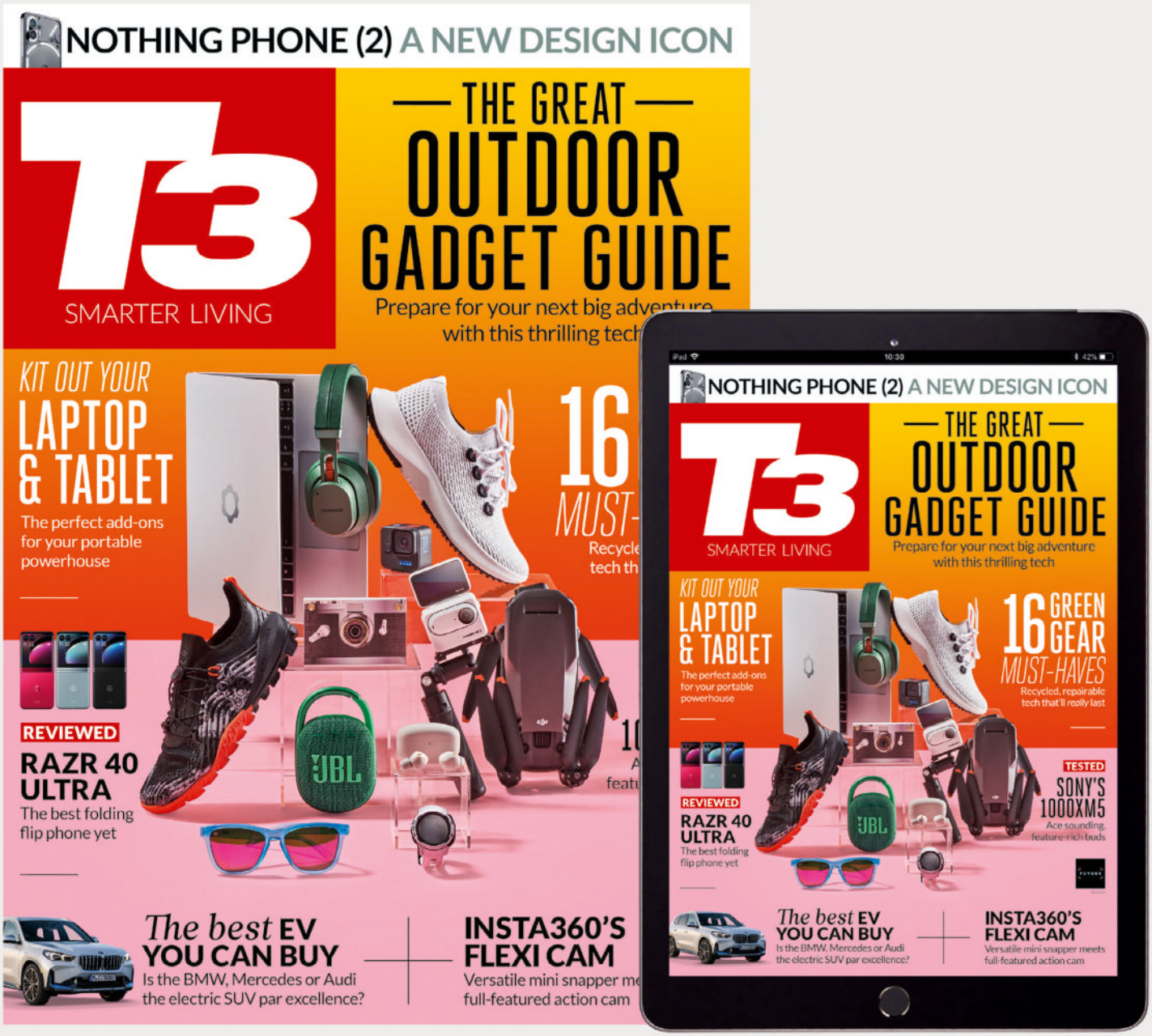

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Mac FORMAT INVESTIGATES

Apple's MLS Season Pass

Fan-focused football – at last!

Why Major League Soccer is a major deal for Apple TV+

WRITTEN BY **MARC CHACKSFIELD**

For any fan of the Premier League, seeing Wayne Rooney and Mikel Arteta on the pitch is nothing new. Both players gained legions of fans when they played for Manchester United and Arsenal respectively in their heyday but things are different this time around.

They're standing watching a spectacle. On the Audi Field, in Washington DC, home to DC United, they wait patiently as light-and-smoke machines are rolled on to the pitch, turning the stadium into a disco.

Fireworks paint the sky red and white, while a flyover and the American national anthem bring the party to a crescendo, just in time for the whistle to blow for kick-off.

This is football Major League Soccer (MLS)-style and there is every reason to party: MLS is going through one hell of a glow-up right now.

Apple has a 10-year deal on the rights to MLS, thanks to a rather surreptitious turn of events, where the owners of the MLS found themselves owning the entire rights for every single team and every single game, both locally and globally. Given the knotty rights for other leagues (Premier League included, which sees its broadcasts split between Sky Sports, Amazon and TNT in the UK), this was an opportunity for a broadcaster to come in and 'own' the entirety of MLS' coverage globally. Which is a pretty big deal!

In a few short months from acquiring the rights, Apple created the MLS Season Pass, a subscription service, available through the Apple TV+ app, and available in more than 100 countries and regions.

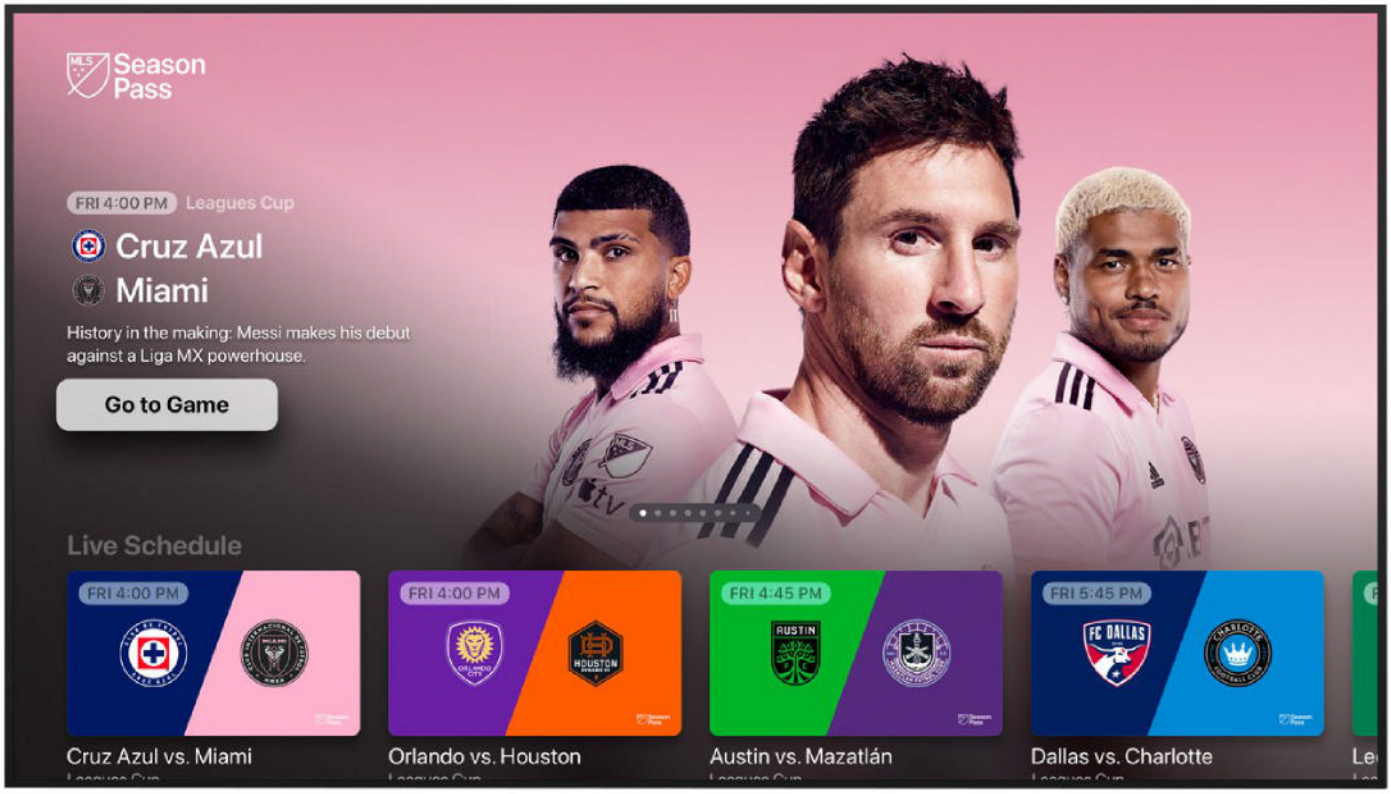
The MLS Season Pass features every live MLS regular-season match, the Audi MLS Cup Playoffs, and Leagues Cup1 all in one place. Plus, the game that marks the midway point of the season: the MLS All-Star Game. A lot of the content is free, including MLS 360, a near five-hour live whip-around show, that captures the key moments from every match.

"It's tough, I won't lie to you, five hours is a long time," says *MLS 360* presenter Bradley Wright-Phillips. "What helps is that throughout the show you could

Apple CEO Tim Cook and Apple VP for Services, Eddy Cue with some of the stars of MLS Season Pass.

Major League Soccer is finally getting the worldwide audience it deserves – thanks to Apple.

› Image credit: Apple Inc



Football superstar Lionel Messi is the latest big-name signing to MLS Season Pass on Apple TV+.

have Taylor [Twellman, MLS commentator] jumping in, or Nigel Reo-Coker [former MLS player] could be there and that helps a lot.

"Preparation-wise I keep notes on players and teams. I rely a lot on my personality, then a few notes here and there as there may be some teams in the West Coast you might not get to see, so you are looking for who are their dangerous players and what they need to do to win that week. The rest, I just go for it."

The *MLS 360* show is the pinnacle of what Apple is trying to do – offer blanket coverage to make sure all teams are treated the same.

It's a monumental undertaking, one that was hammered home when we visited an outside broadcasting (OB) truck on match day, one of a handful that were there to handle the hundreds of live feeds and turn them into HD live streams, with just a few seconds delay from what's going on in real-time to what you see on the screen.

When it came to broadcasting the matches, Apple worked with the MLS to make sure there are consistent match times and no blackouts – a first in live sports broadcasting.

"We design our products by thinking, 'how do we make the best product?' And ultimately, it's always worked for us. So that's kind of the way we approach this," says Apple's Senior Vice-President for Services, Eddy Cue.

"Sports is the most awesome unscripted drama. You just don't know what's going to happen. And so I think it has tremendous value as we go forward."

"This thing can be huge and it should be huge. And we've got to execute, they've got to execute, and a lot of things have to happen, but it's not unrealistic. It is a huge opportunity."

"This thing can be huge and it should be huge"
– Apple's Senior VP of Services, Eddy Cue

Fan service

The person in charge from an MLS perspective is Don Garber, commissioner of the MLS.

"We couldn't be more excited about partnering with the largest, most innovative company in the world," says Garber.

"It's year one of a 10-year deal but really we've hit it by storm. The games are produced to a very high quality."

"Every team has its own room on MLS Season Pass, in which they can feed an endless amount of content. So think about the idea that every club has their own programme to do whatever it is that they think will entertain, inspire and provide value to their fans."

"In 2022, there were 65 different start times in the MLS. What Apple did was come with a blank piece of paper and said, 'what can we do?' Everything they have done has been about the

Major League Soccer matches will be shown in over 100 countries and regions.

fan experience – and for the MLS fan that had been second rate. All of a sudden the fan is being treated with the right respect," says Twellman.

"This is a 10-year partnership and we've already seen a huge amount. The MLS Season Pass happened within the first year, so just think what the 10th year will be like. We all know in the media world that three years is a long time, five years is a long time, 10 is insane."

"The infrastructure is pretty much there now. For the '94 World Cup there was nothing. Now every country that comes to the US, Mexico and Canada, they're gonna see the infrastructure there. That's all of a sudden going to amplify the impact on the culture of the game."

While the World Cup will shine a spotlight on US soccer on a national level, it's already well within the glare of the world's media thanks to the signing of Lionel Messi for Inter Miami CF, a club co-owned by David Beckham, who himself turned the world on to MLS back in 2007.

Star power

It's hard to miss Apple's pink GOAT billboards celebrating the news of the best-ever football player choosing its league as his new home. At his unveiling event, Lionel Messi couldn't keep the grin off his face.

Wayne Rooney played for DC United, before having a stint as manager of Derby County. He's back in DC managing the team he once played for and managed the MLS All-Stars for the All-Star Game against Arsenal this year.

"The MLS is developing at a rapid pace. Getting Lionel Messi into the MLS is huge," said Rooney in the game's press conference. "He's a player I have always loved playing against and watching. It's going to be great for fans in the States to get to watch him up close.

"Obviously the Apple deal for the league is huge and getting Messi could be a real game changer. We saw it with Cristiano Ronaldo in Saudi Arabia, the impact he has had with a lot more players going out there to play.

"I think it was important for the league to get Messi in to show that the MLS can compete against other countries for players."

Mikel Arteta's allegiance is with the Premier League but he also noted the importance of Messi joining the MLS in the press conference.

"The way the league has developed over the last 20 years is phenomenal. It is very different now to what it was, thanks to it gaining top talent and now the best-ever football player. It's a very clever move by the MLS and it really puts a spotlight on the league."

Past matches include the likes of Manchester United and AC Milan and a Skills Challenge was introduced in 2018, which is more akin to what you see in the National Basketball Association (NBA) league than on the soccer pitch.

There was a real buzz about the events this time, with the MLS All-Stars training within view of Capitol Hill, on The Mall, and even heading to The White House to show off their tricks on the White House lawn.

The MLS All-Star game against Arsenal was played to a sell-out crowd of 20,621. While many in the audience didn't get the win they wanted, with Arsenal managing to put five goals past the All-Star Team, spirits were not dampened and the applause for key 'home' players such as Christian Benteke was rapturous.

Having the game played in the same week that Messi made his debut for Inter Miami CF, where he scored the winner from a free kick, has given the MLS the boost it deserves right now.

Republished from theshiftnews.com

Hundreds of live feeds are turned into live HD streams of each match, with only a few seconds of delay.

MLS Season pricing

› MLS Season Pass is available for £14.99/month or £99/season.

› Existing Apple TV+ subscribers can get access for £12.99/month or £79/season.

The on-pitch action is captured in real time with live feeds sent to outside broadcasting trucks.

› Image credit: Apple Inc

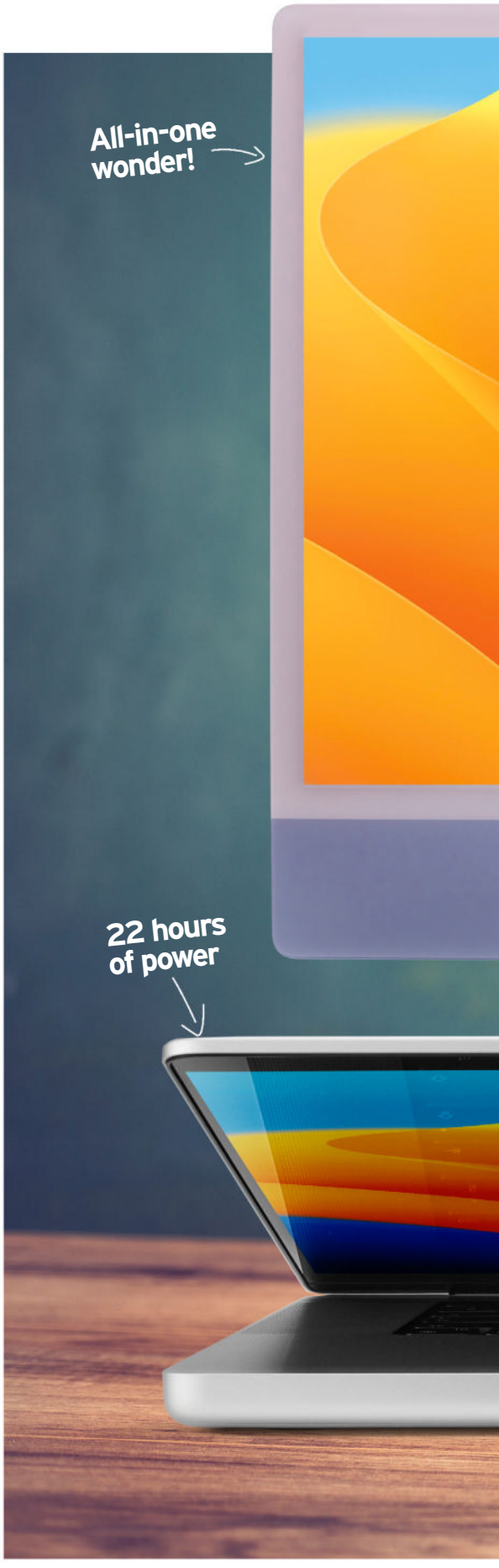
MEET YOUR NEW MAC

Choose the right one for you!

Written by Ian Osborne

What do you look for in a Mac? Do you want a powerful computer that can handle multiple 8K video feeds, or are you after a more basic device for web surfing and email? Does it need to be portable or are you happy to leave it on your desk? Is money no object or do you have to watch what you spend? Or maybe you're looking for customisation options when buying a Mac from the Apple Store? In this feature, we'll explore the wide range of choices available to you, according to your needs and budget. There's a Mac for (almost) every pocket. We also recommend some essential add-ons, accessories and apps you can buy for your new Mac to help you make the most of it.

But before you go ahead and buy a brand new Mac, bear in mind the other options. The Apple Refurbished Store (apple.co/3phwED7) sells refurbished Macs and other Apple products, often at a decent discount. These have been thoroughly tested and are backed by a one-year warranty. They may have minor cosmetic defects, but they're as good as new. You could also consider buying a secondhand Mac. There's plenty to choose from on eBay, Facebook Marketplace and local computer retailers. If you have a limited budget but don't need to run the latest version of macOS, a used Mac laptop could be a great choice. So, from a top-tier Mac for power computing to an affordable Apple machine for hobbies, let's take a look at what's available.



Best
budget
buy

Best budget desktop Mac mini

The cheapest way to own a new Mac

1 **Ethernet port**
› The Mac mini has built-in Wi-Fi 6E, but for a cabled connection use its 1Gb Ethernet port. 10Gb Ethernet is also available.

2 **Thunderbolt 4**
› The £649 and £849 Mac mini models have two Thunderbolt 4 ports, while the £1,399 M2 Pro version has four.

3 **HDMI**
› The easiest way to connect your Mac mini to a monitor is through the widely used HDMI port.

The Mac mini is the cheapest Mac in the Apple Store by some considerable distance. The entry-level model is just £649, a full £400 less than the next cheapest option – the 13-inch MacBook Air (£1,149). However, don't assume it's underpowered. This entry-level Mac mini features the latest Apple Silicon M2 system-on-a-chip (SoC), with an 8-core CPU, a 10-core GPU and 8GB of unified memory. You only get 256GB of storage, but if you want more, you can add an external drive or buy the mid-range model instead (£849, 512GB). The top-of-the-range Mac mini also has a 512GB SSD, but it has an M2 Pro chip with 16GB of unified memory and other enhancements (£1,399).

With the Mac mini, you only get the computer and power cord in the box – no accessories are supplied.

Whichever Mac mini you buy, it has one significant – or maybe 'potential' – drawback. All you get in the box is the computer and a power cord. You don't get accessories; not even a mouse, trackpad or keyboard. As the Mac mini has no screen, you need a monitor too. Naturally, this isn't a problem if you already own these items, but if you don't, make sure you factor in their cost when deciding what to buy. Not that these need to be particularly expensive, of course. A Windows keyboard works fine with a Mac, but make sure the display has an HDMI connection. With some hunting and a bit of luck, you could potentially buy everything you need for your Mac mini for around £200-£300.

As well as those on a budget, the Mac mini is ideal for commuters who want to use the same computer at home as well as in the office. At 19.7cm square, 3.58cm high and 1.18kg (1.28kg for the top-of-the-range model), it's extremely portable. If you have a monitor, keyboard and mouse/trackpad controller at home and in the office, you only have to transport the Mac mini between the two. The power cord is a cheap, readily available figure-of-eight lead, so you could leave one at each station for convenience.

Mac mini £649
(Entry level)
Chip: Apple M2, 8-core CPU (4 performance cores, 4 efficiency cores), 10-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 2x USB-A, 1x HDMI 2.0, 3.5mm headphone jack, Gb Ethernet (10Gb Ethernet option)

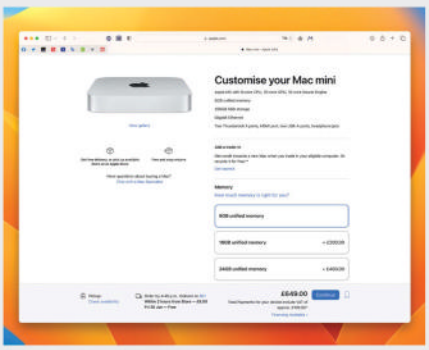
Once again, the Mac mini's small size and (relatively) low price should not imply a lack of power. Unless you have very high needs, the Mac mini can generally handle anything you throw at it, including

Upgrade options

If you order your Mac mini via the online Apple Store, you can add custom options depending on which model you buy. The two M2 Mac mini models can be upgraded to 16GB or 24GB unified memory, and/or a 512GB (on the cheapest model), 1TB or 2TB solid-state drive (SSD) for extra storage.

Opt for the most expensive Mac mini and you can upgrade its M2 Pro processor from a 10-core CPU and 16-core GPU to one with a 12-core CPU and 19-core GPU. You can also go for 32GB unified memory, and a 1TB, 2TB, 4TB or even an 8TB SSD.

For extra networking speed, you can upgrade any Mac mini's Ethernet port to 10Gb Ethernet, and you can also choose to have the Final Cut Pro and/or Logic Pro apps preinstalled.



You can upgrade your Mac mini on the online Apple Store before buying.

› Image credit: Apple Inc

4
USB Type A
› All models offer two USB-A ports, for up to 5Gb/s transfer speeds. These are great for hubs and peripherals.

5
Audio output
› The Mac mini has a built-in speaker, but you can use this 3.5mm headphone jack for wired cans or external speakers.

Mac mini £1,399
(Ultimate)
Chip: Apple M2 Pro with 10-core CPU (4 performance cores, 4 efficiency cores), 16-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 16GB)
Storage: 512GB (upgradeable to 1TB or 2TB)
Ports: 4x Thunderbolt/USB 4, 2x USB-A, 1x HDMI 2.0, 3.5mm headphone jack, Gb Ethernet (10Gb Ethernet option)

photo editing, video production and the latest games. The cheaper two Mac minis are limited to two displays, though, and the top-of-the-range M2 Pro three screens, so bear this in mind if you think it will be an issue.

Memory in mind

Something else worth thinking about is it's not possible to upgrade a Mac mini after you've bought it. You can't add memory as this is integrated into the M2/M2 Pro chip, and there's no way of taking out the SSD and replacing it with a bigger one either. This, of course, is true for all modern Macs, so whichever you decide to buy, if you think you'll need more memory, make sure you take advantage of the upgrade options when you order.

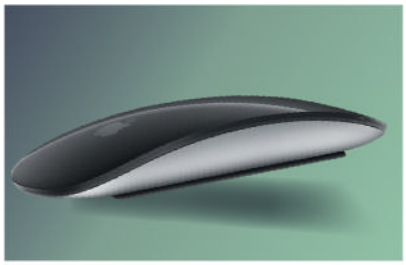
We doubt anyone would be disappointed with a Mac mini. Those with intense computing needs will already know they require a Mac Studio or Mac Pro, meanwhile everyone else can happily take advantage of Apple's smallest and most cheapest desktop.

5 best Mac mini accessories

When you buy a new Apple Mac mini, you don't get a keyboard, mouse/trackpad controller or a monitor. If you don't already have suitable accessories, you will have to buy them separately. Apple sells some great keyboards and controllers, but its screens are prohibitively expensive. Here are some of the better options you can choose for your new Mac mini.

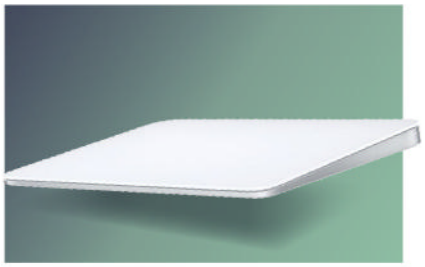
Apple Magic Keyboard

› From £99 › www.apple.co.uk
› Apple's Magic Keyboard is excellent to type on. It's wireless, connecting to your Mac using Bluetooth. A Touch ID version is available for £149 (Apple silicon Macs only), as is a model with added numeric keyboard in white (£179) or black (£199).



Apple Magic Mouse

› From £79 › apple.com/uk
› The wireless, rechargeable Magic Mouse features a multi-touch surface that lets you perform simple gestures, such as swiping through web pages or scrolling up and down. It lasts about a month before it needs recharging. The black version shown costs £99.



Apple Magic Trackpad

› From £129 › apple.com/uk
› For a wider range of gestures, you need a Magic Trackpad. It's pricier than the Magic Mouse, but it's great for zooming, pinching, scrolling, swiping, rotating and more. Again, it's wireless, rechargeable and available in white (£129) or black (£149).

Philips 243B1/01 LCD monitor with USB-C

› £281.24 › philips.co.uk
› If you're after a good-quality display on a budget, this 24-inch model from Philips should fit the bill. It offers Full HD (1920x1080) resolution, stereo speakers and a versatile base. Plus, a USB-C dock for attaching peripherals.

co2CREA hard storage travel protective case

› £42.99 › amazon.co.uk
› If you want to protect your Mac mini when you're on the go, this handy carry case is ideal. It features sturdy zips, a convenient handle and space for accessories such as your mouse, cables and more.

› Image credits: Apple Inc, Koninklijke Philips N.V., Amazon.com Inc

Best budget laptop
MacBook Air

Apple's excellent but less expensive notebook

There are three MacBook Air models currently on sale. The £999 entry-level option is based on an Apple silicon M1 system-on-a-chip (SoC), with an 8-core CPU and a 7-core GPU. It has a 13.3-inch Retina display, up to 16GB unified memory and 256GB of solid-state drive storage.

If you want the more modern M2 chip, for £1,149, you can get an 8-core CPU and an 8-core GPU, 8GB of unified memory, a 256GB SSD and a 13.6-inch Liquid Retina display with True Tone. Paying an extra £300 nets you 10-core GPU, plus 512GB of solid-state storage.

Connectivity options are limited, so get yourself a Twelve South StayGo USB-C Hub.

At the top of the range is the brand new 15-inch MacBook Air. There are two models on offer, both of which have an 8-core CPU and 10-core GPU, 8GB of unified memory and a 15.3-inch Liquid Retina display with True Tone. The only difference between the lower-cost 15-inch model (£1,399) and the higher-specced one (£1,599) is that the cheaper MacBook Air has a 256GB SSD, while the more expensive one gets 512GB.

All MacBook Airs have around 18 hours of battery life on a full charge, which is enough to keep you going all day. The cheapest model has a 720p FaceTime HD camera, while the others offer 1080p.

Great performance

One of the problems with the MacBook Air is it's often squeezed by Apple's other products. If you're considering a cheaper model, an iPad Pro or even an iPad Air with a keyboard case might suit your needs more closely at a lower price. If you're after a higher-priced MacBook Air, you might not have to spend much more to get a more sophisticated MacBook Pro instead. But if you definitely want a laptop, the MacBook Air offers a great performance for the money and if you buy a 15-inch model, you get a screen space you couldn't get from the MacBook Pro without spending a lot more.

The MacBook Air is ideal for students. It's the thinnest, lightest notebook in

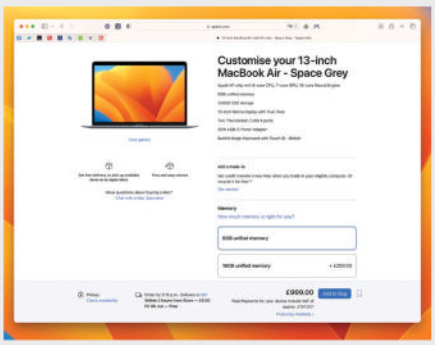
MacBook Air £1,149
(Mid-range)

Display: 13.6in Liquid Retina with True Tone
Chip: Apple M2 with 8-core CPU (4 performance cores, 4 efficiency cores), 8-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 3.5mm headphone jack

Upgrade options

Order your MacBook Air at the Apple Online Store to add custom options. Upgrade the entry-level M1 model to 16GB of unified memory, and/or enlarge the SSD to 512GB, 1TB or 2TB. For the 13-inch and 15-inch M2 models, step up the processor on the cheaper model, boost the unified memory to 16GB or 24GB, boost storage to 512GB, 1TB or 2TB and upgrade the power supply unit.

You can opt to have Final Cut Pro and/or Logic Pro preinstalled on any MacBook Air. You can also change the keyboard (for free) if you wish. By default, you get a British Backlit Magic Keyboard with Touch ID, but you can swap it for a US or International English keyboard, or choose other language layouts such as German, Italian, French, Russian, Chinese and more.



You can customise the cheapest MacBook Air by stepping up the memory or storage if you wish.

Image credit: Apple Inc, Twelve South LLC

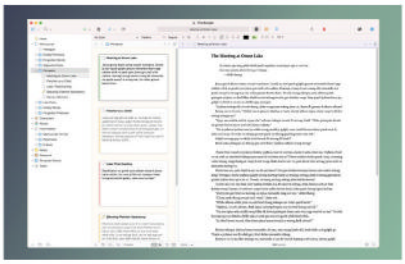
MacBook Air £1,399
(Ultimate)
Display: 15.3in Liquid Retina with True Tone
Chip: Apple M2 with 8-core CPU (4 performance cores, 4 efficiency cores), 10-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 3.5mm headphone jack

Apple's roster (they weigh between 1.24 and 1.51 kg, depending on the model), making it perfectly portable. And though it's considered the lower-specced of Apple's two laptop ranges, it's a powerful beast in its own right. For example, the recent resource-hungry game No Man's Sky runs on any Mac with Apple silicon, including the MacBook Air range. If you need more screen space, maybe for video or picture editing, you can always connect an external display.

One area where the MacBook Air lags behind other Macs is in connectivity. Whichever model you buy, you only get two Thunderbolt/USB 4 ports and a headphone socket. However, investing in a hub such as Twelve South's StayGo or StayGo Mini USB-C Hub will give you more choice. Plug the hub into one of the ports to open up the connectivity to USB-A, Ethernet, HDMI and more.

5 best MacBook Air accessories

There are all sorts of software packages you can buy for your MacBook Air – or indeed any Mac. Whether you want to write a novel or screenplay, use your Mac for productivity, add a little functionality for when screen space is at a premium, or simply protect your investment, it's all available for your Mac, via the Mac App Store or the software's website.



Scrivener

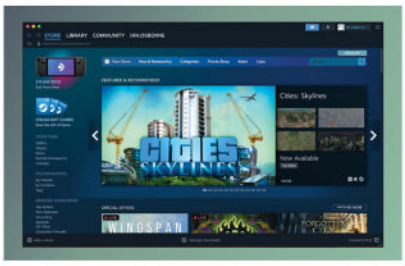
› £49.99 › literatureandlatte.com
› Do you have a novel in you? Could you write that screenplay you've been thinking of for years? Scrivener is a word processor designed for long-form writing. If you're embarking on a huge writing project, there's nothing better.

iWork

› Free › apple.com/uk
› iWork is a suite of Apple apps for productivity. There's Pages for word processing and basic layout, Numbers for spreadsheets, and Keynote for presentations. And if you bought a brand new Mac, these apps are free from the Mac App Store.

Unclutter

› £19.99 › unclutterapp.com
› With Unclutter installed, you can move your pointer to the top of the screen and swipe down for a three-in-one panel. This panel gives access to your clipboard history, a space to store files and folders and a notes section. Hide it when not in use.



Steam

› Free › steampowered.com
› If you like video games, download the Steam client. Use it to buy and launch games, taking advantage of the many discounts you only get on digital platforms. You can join the Steam community too, to exchange tips and talk about your favourite titles.

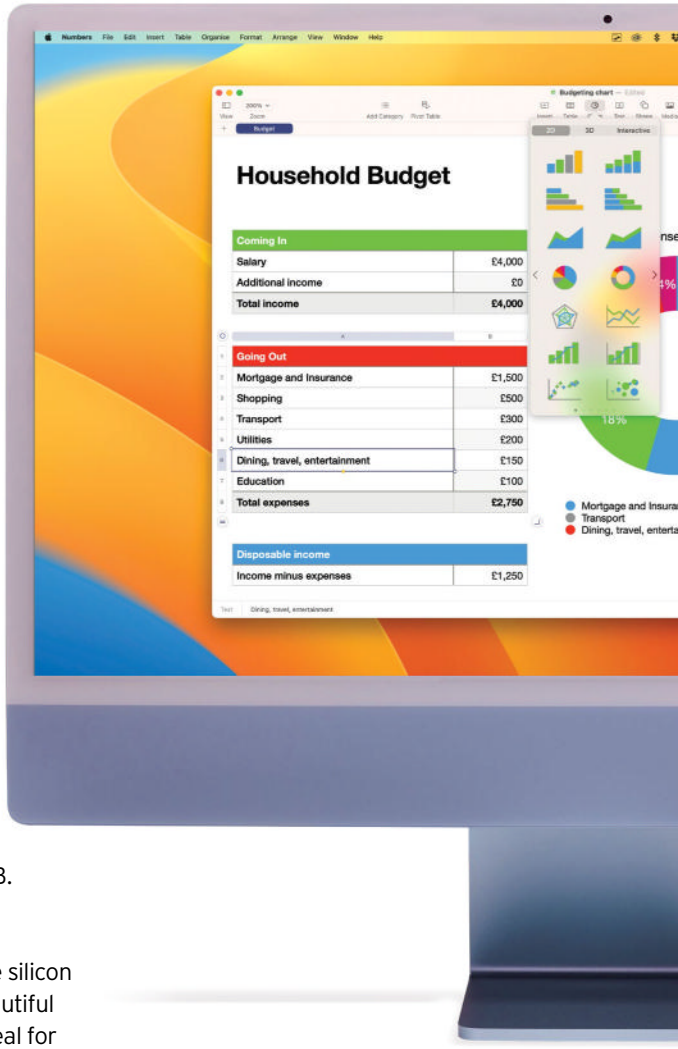
AppleCare+

› Various prices › apple.com/uk
› For peace of mind, AppleCare+ gives you an extra warranty for your Apple products. The price depends on the model you wish to insure. For example, AppleCare+ for a £1,149 M2 MacBook Air costs £69.99 a year or £199 for three years.

› Image credit: Apple Inc, Valve Corporation, Literature & Latte Ltd, Eugene Krupnov/UJ Labs

Best home desktop iMac

Apple's top desktop is still going strong



The iMac is a desktop with an impressive history. Introduced in 1998, a couple of years later a new edition was released in five colours. A little over two decades later, and Apple returned to this theme with the Apple silicon M1 iMac, which is available in seven colours; Green, Yellow, Orange, Pink, Purple, Blue, and Silver, or just Blue, Green, Pink or Silver for the least expensive model.

The iMac is an all-in-one computer, meaning the screen, computer architecture and webcam are all housed in one unit. And it's a delight to look at. The body is just 11.5mm thin, and features a solid, rich shade of your chosen colour on the back and the stand, with a lighter contrast shade at the front.

All three of the current iMac models feature an M1 chip with an 8-core CPU with four performance cores and four efficiency cores. They boast a 24-inch 4.5K Retina display, 8GB of unified memory and a 16-core Neural Engine. The cheapest model has a 7-core GPU, with the other two having eight cores. The most expensive iMac has a 512GB SSD, while the others have 256GB.

The latest iMac is available in seven exciting colours. Which one would you choose?

A stylish choice

The incredible power of the Apple silicon processor, combined with the beautiful Retina screen, makes the iMac ideal for most people. It covers a huge range of tasks – design, picture editing, video production, writing, web-based tasks and more. It's quite capable of playing the latest games too, but Mac gaming is so far behind the PC and consoles in this respect it must always be considered a bonus not a primary reason for purchase. Unlike the Mac mini it isn't easily transportable, but if this isn't an issue for you, it's great. The iMac's good looks also make it perfect for businesses in a customer-facing role.

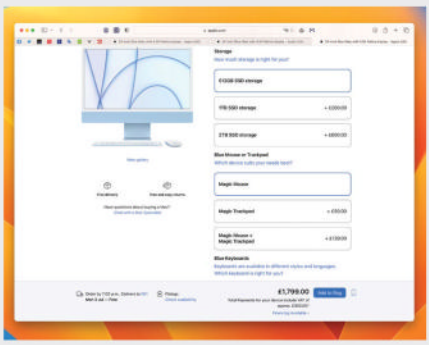
A key criticism of the iMac is that it's not after-market upgradeable in any way, shape or form. What you buy is what you get – you can't add memory, expand the internal storage or upgrade the graphics card. This isn't as much of a deal-breaker as previously, though. These days it's true for nearly all modern Macs, not just the iMac, and fast Thunderbolt ports that can

iMac 24inch £1,399
(Entry level)
Display: 23.5in 4.5K Retina (4480x2520) with True Tone
Chip: Apple M1 with 8-core CPU (4 performance cores, 4 efficiency cores), 7-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 16GB)
Storage: 256GB (upgradeable to 512GB or 1TB)
Ports: 2x Thunderbolt/USB 4, 1x Gb Ethernet (option)

Upgrade options

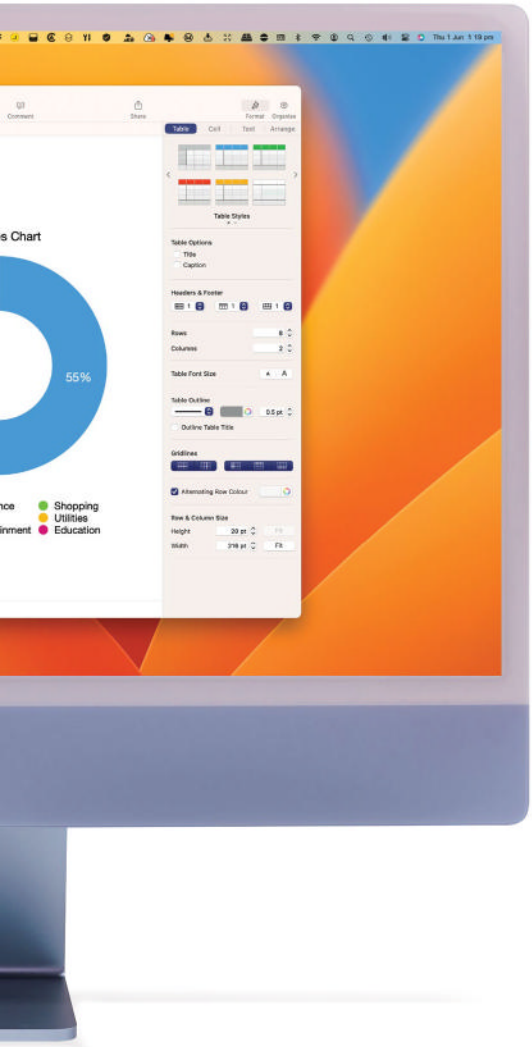
You can't upgrade your iMac internally after you've bought it, but there are options if you buy via the online Apple Store. If 8GB of unified memory isn't enough, you can upgrade to 16GB. You can also upgrade the internal solid-state storage to 512GB or 1TB for the cheapest iMac, and up to 2TB for the other two models. The cheapest iMac doesn't have Gigabit Ethernet, but you can add it.

By default, the iMac comes with a Magic Mouse. The custom options on the online Apple Store let you swap this for a Magic Trackpad, or both if you wish. You can also swap the default keyboard for a version with a numeric keypad, and change its language layout too. The entry-level iMac's keyboard doesn't have Touch ID by default, but again, you can add it if you want.



You can do much to tailor your iMac to your needs, including adding memory or swapping keyboards.

Image credit: Apple Inc



iMac 24inch £1,799
(Ultimate)

Display: 23.5in 4.5K Retina (4480x2520) with True Tone
Chip: Apple M1 with 8-core CPU (4 performance cores, 4 efficiency cores), 8-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 16GB)
Storage: 512GB (upgradeable to 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 2x USB 3, 1x Gb Ethernet

handle high-speed storage that make its lack of internal expandability somewhat moot. Just make sure you take advantage of the Apple Store's customisation options if you need something more than what an off-the-shelf iMac can offer.

So should you buy one right now? Although today's iMac is powerful, it's the only computer in Apple's current range that isn't available with an M2-series chip. In fact, iMac aside, the only other machine still available to buy with an M1 chip is the £999 13-inch MacBook Air. We're due an M2 iMac, and maybe a larger model with a 27- or 28-inch screen soon, possibly as soon as October. So while the M1 iMac is great, we suggest you wait if you can and see what Apple's Autumn refresh has in store. If you must buy now we'd avoid the cheapest iMac, which lacks Touch ID and Ethernet, omits the two USB 3.0 ports, has one fewer GPU core and is only available in four colours.

5 best accessories for iMacs

There are plenty of things you can buy to help you make the most of your iMac. If the public has access to the room your machine is in, for example, you might want to add a security lock to keep it safe or prevent theft. Or maybe you could invest in either a portable external drive or a USB flash drive for taking files away with you. Here are five more great accessories for your iMac.

Twelve South BackPack

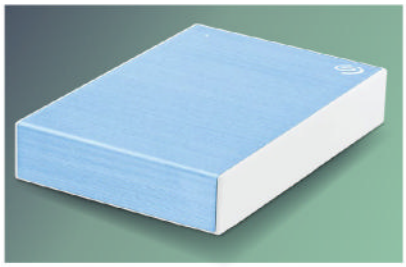
› £44.99 › twelvesouth.com

› This aluminium shelf clips to the back of your iMac. It's perfect for storing your external hard drive or hub, which you don't need physical access to on a daily basis. It's also great for keeping your desk tidy, and is easy to fit.

HP ENVY 6430e All-in-One printer

› £110 › hp.com

› Which printer you choose depends on your specific needs, but if you're after an all-round device, this one's great. It can scan and copy as well as print, it has two-sided printing and it connects wirelessly or through USB.



Seagate One Touch external hard drive

› £144.99 › seagate.com

› If you want an external storage drive, a desktop drive is cheaper per GB, but a portable drive doesn't need plugging into the mains. An SSD is faster, but a hard disk drive (HDD) is cheaper. This 5TB desktop HDD comes in six colours.

ASUS VP32UQ Eye Care Monitor

› £448.99 › asus.com

› Everyone is more productive with a second screen. This 31.5-inch 4K display features TÜV Rheinland-certified Flicker-free and Low Blue Light technologies for an even more comfortable viewing experience.

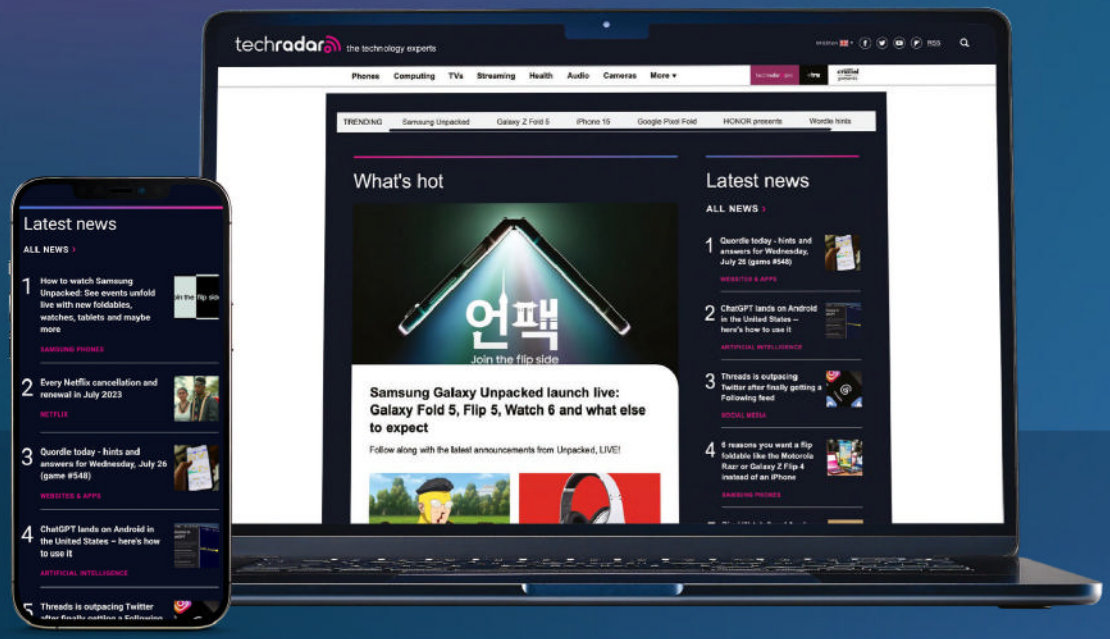
Game controllers

› Various prices and manufacturers

› Connect a PlayStation or Xbox controller to your Mac for wireless gaming. See apple.co/3r9TOMb for compatible Sony controllers and connection instructions, and apple.co/3NuzZXh for Microsoft models. Third-party options are also available.

› Image credits: Apple Inc, HP Development Company L.P., Seagate Technology LLC, ASUSTeK Computer Inc, Sony Interactive Entertainment, Microsoft

Meet the technology experts



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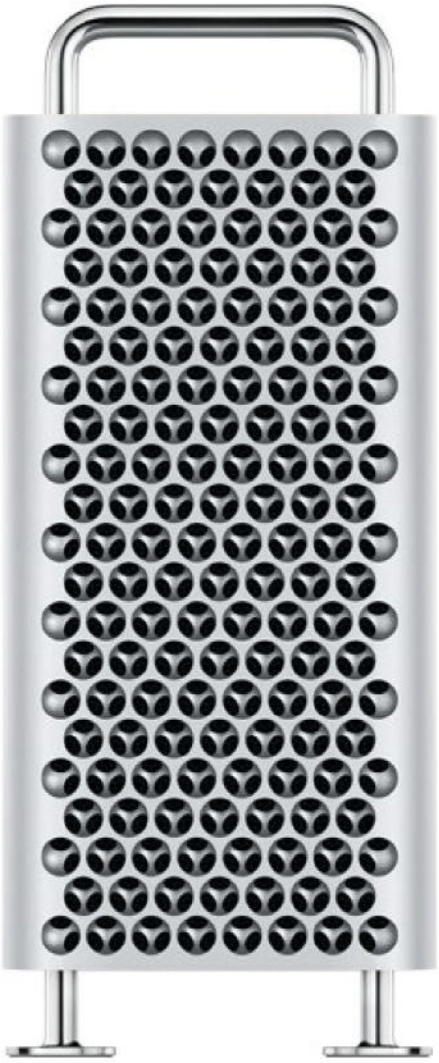
Best luxury buy
Mac Pro

The ultimate in power computing



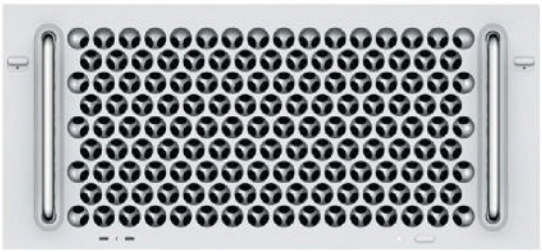
The Mac Pro is power. Pure, undiluted power. If you need the fastest, most capable Mac there is, the Mac Pro is for you – assuming you can afford it that is... The machine costs £7,199 and there's only one off-the-shelf configuration for it (however, lots of custom options are available). The price doesn't include a monitor, although you do get a mouse and a keyboard in the box (unlike the Mac mini and Mac Studio).

At the heart of the Mac Pro is the Apple silicon M2 Ultra system-on-a-chip (SoC). Built from two connected M2 Max chips, it has a 24-core CPU with 16 performance cores and eight efficiency cores, a 60-core GPU, 32-core Neural Engine and 800GB/s of memory bandwidth. These figures are mind-boggling, especially when you consider you can upgrade them even further via th Apple Store's build-to-order options.

You can't add memory after buying the Mac Pro, but there are after-market upgrade options made possible by the six PCi slots (four PCIe x8 gen 4 slots and two PCIe x16 gen 4). If you need more storage you can add high-speed solid-state storage. The latest PCIe gen 4 SSD cards, for example, are capable of speeds of up to 26GB per second.

If you're a video editor, AutoCAD designer or software developer – or just a big show-off – you'll be glad to hear you can link up to eight 4K screens to your Mac Pro. If you need an even higher resolution, it can also handle up to six 6K monitors, or three at up to 8K. That's a lot of screen real estate.

The Mac Pro is based on a tower system, with a rack-mounted version available for £7,699. The tower measures 52.9cm high, 21.8cm wide and 45cm deep, so it's best to keep it under your desk. There's two Thunderbolt 4 (USB-C) ports atop the device, which are easily reachable when it's on the floor.



You can buy the Mac Pro in tower or rack form factors.

Mac Pro £7,199
(Unmodified)

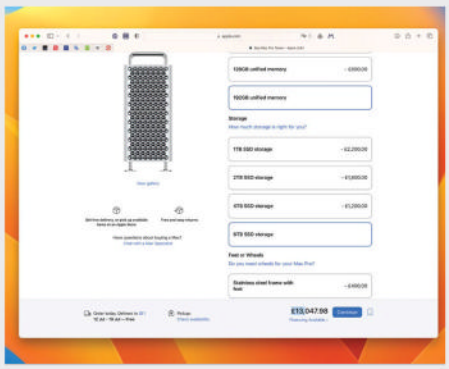
Chip: Apple M2 Ultra with 24-core CPU, 60-core GPU, 32-core Neural Engine
Memory: 64GB unified memory (upgradeable to 192GB)
Storage: 1TB (upgradeable to 2TB, 4TB, 8TB)
Ports: Six full-length PCI Express gen 4 slots, one half-length x4 PCI Express gen 3 slot with Apple I/O card installed, eight Thunderbolt 4 (USB-C) ports, two USB-A ports (up to 5Gb/s), two HDMI ports, two 10Gb Ethernet ports, 3.5mm headphone jack.

The Mac Pro is for those with extreme computing needs. If you're not sure if you need one, you probably don't, but for those that do, it's an amazing piece of kit.

Upgrade options

With a computer as powerful as the Mac Pro, you'd think there was nowhere to go when it comes to upgrades. Yet there are many options to boost the memory, storage and even its incredible processor. If you need more graphical power, you can upgrade the M2 Ultra chip to one with a 76-core GPU, but it costs an extra £1,000. You can upgrade to 128GB or 192GB of unified memory, and 2TB, 4TB or 8TB of storage. And, for an extra £400, you can add wheels to its stainless steel frame.

In the box you get a Magic Mouse, which you can swap for a Magic Trackpad (or have both), and a keyboard with numeric keypad and Touch ID (you can change the language layout if you wish). You can also pre-install Logic Pro and/or Final Cut Pro.



It's possible to spend more than £13,000 on a Mac Pro!

› Image credit: Apple Inc

Best Mac laptop for work

MacBook Pro

The finest notebooks money can buy

The MacBook Pro is for anyone who wants more from their mobile Mac. Does it have more power? Obviously. More screen space? Probably. And more connectivity? Definitely!

There are eight MacBook Pro models in Apple's current line-up; two 13-inch models, three with 14-inch screens and at the top of the range, three 16-inch laptops. To be honest, there's little to commend the 13-inch MacBook Pro. Available in Space Grey or Silver, they're powered by Apple M2 chips, the same as the MacBook Air, and they still have a Touch Bar, an irritating feature that never caught on. If you're satisfied with this level of performance (and it's no slouch), you might as well save yourself some money and buy either a 13-inch M2 MacBook Air or its 15-inch sibling instead.

The two cheaper 14-inch and 16-inch MacBook Pro models have M2 Pro Apple silicon, with the top-of-the-range model in each size having an M2 Max. These are significantly more powerful than the standard M2. Even the entry level 14-inch MBP has a 10-core CPU, a 16-core GPU and 16GB of unified memory. At the other end of the scale, the most expensive 16-inch model has a 12-core CPU, a 38-core GPU and 32GB of unified memory. This is as powerful as it gets for a laptop, and is likely to be more than a match for all your mobile computing needs. The two cheapest models in each size have 512GB solid-state drives (SSDs), with the rest of the range sporting 1TB.

The MacBook Pro boasts awesome power, but only two enclosure colours.

One of the main advantages enjoyed by the MacBook Pro is its connectivity

MacBook Pro 13in £1,349
(Entry level)

Display: 13.3in Retina (2560x1600) with True Tone
Chip: Apple M2 with 8-core CPU (4 performance cores, 4 efficiency cores), 10-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 3.5mm headphone jack

MacBook Pro 14in £2,149
(Mid-range)

Display: 14.2in Liquid Retina (3024x1964) with True Tone
Chip: Apple M2 Pro with 10-core CPU (6 performance cores, 4 efficiency cores), 16-core GPU, 16-core Neural Engine
Memory: 16GB (upgradeable to 32GB)
Storage: 512GB (upgradeable to 1TB, 2TB, 4TB or 8TB)
Ports: 3x Thunderbolt/USB 4, HDMI port, SDXC card slot

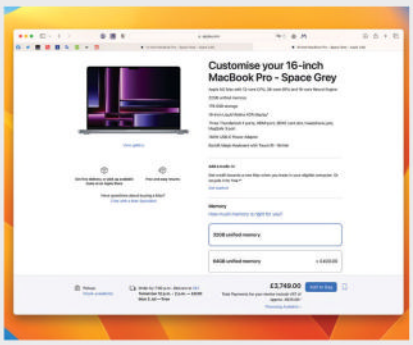
MacBook Pro 16in £3,749
(Ultimate)

Display: 16.2in Liquid Retina (3456x2234) with True Tone
Chip: Apple M2 Max with 12-core CPU (8 performance cores, 4 efficiency cores), 38-core GPU, 16-core Neural Engine
Memory: 32GB (upgradeable to 96GB)
Storage: 1TB (upgradeable to 2TB, 4TB or 8TB)
Ports: 3x Thunderbolt/USB 4, HDMI port, SDXC card slot

Upgrade options

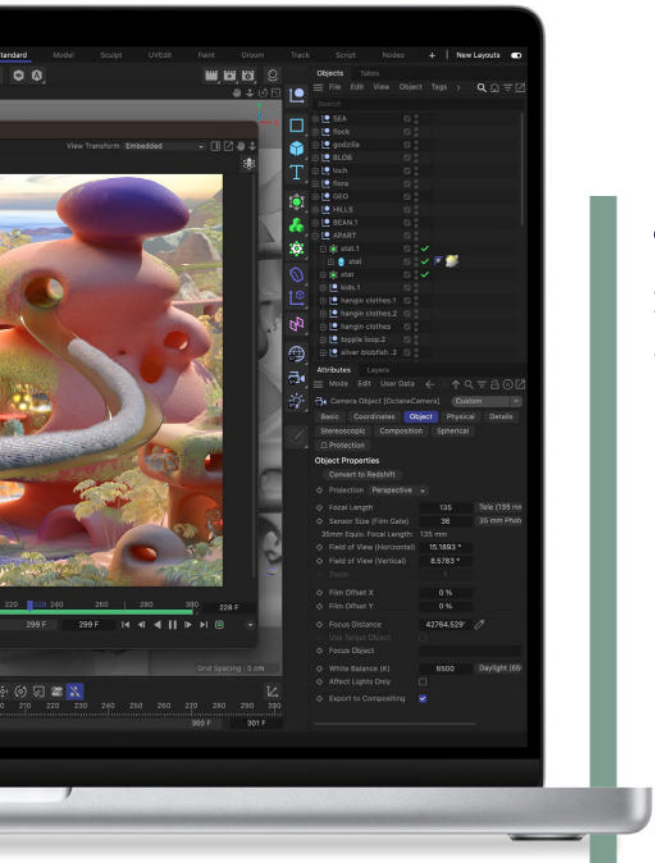
As with other Macs, the customisation options differ depending on which model you order. Every 14- and 16-inch model except for the most expensive of the larger size has an upgradeable Apple silicon chip. Unified memory can be expanded up to 32GB for the cheapest and middle options in each size, with the top 14-incher being expandable up to 64GB and the top 16-inch model up to 96GB. For storage, all 14-inch and 16-inch MacBook Pros can be upgraded to 1TB (for the cheaper model in each size, which only has 512GB by default), 2TB, 4TB or 8TB SSDs.

Memory and storage can be upgraded on the 13-inch MacBook Pro. You can change the keyboard language and opt for Logic Pro and/or Final Cut Pro preinstalled on all MacBook Pros.



There are lots of options to customise when ordering a 14- or 16-inch MacBook Pro.

Image credit: Apple Inc



options. Unlike the MacBook Air, which is limited to two Thunderbolt/USB 4 ports and a headphone jack, the 14- and 16-inch Pros have three Thunderbolt 4 ports, an HDMI port, an SDXC card slot and a headphone jack. They also have MagSafe charging ports, something the 13-inch MacBook Pro lacks. They don't, however, have USB-A ports (USB-A being the 'regular' USB port, long and rectangular in shape). There's an HDMI port so you can connect an external display without adaptors, but if you have any USB-A peripherals you need to use with your MacBook Pro, it's best to get a home or travel hub to give you even more connectivity options.

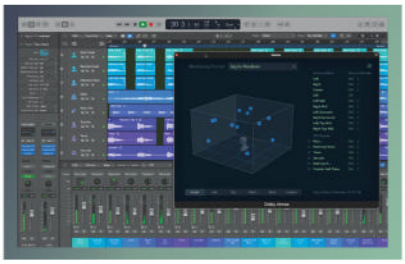
Bigger and better

You can only get a MacBook Pro – of any size – in Space Grey or Silver. The 14-inch MacBook Pro has up to 18 hours of battery life, rising to up to 22 hours for the 16-inch model, which is larger and can therefore house a bigger battery.

The MacBook Pro is for those who require more power than the MacBook Air can deliver. These days, your needs would have to be pretty high to fall into this category, but if you regularly use your laptop for computer-aided three-dimensional design, intensive photo editing or multi-stream video production, you might find the MacBook Pro is more in line with your work.

5 best apps for the MacBook Pro

For anyone who's invested in a MacBook Pro, it's safe to assume you're planning to use it for some intense, processor-intensive tasks. For this, you should turn to high-end, professional applications to help you do the job with ease. And that's what we're looking at here. Naturally, these apps run on any Mac that meets the minimum specification requirements of the software; it doesn't have to be a MacBook Pro.



Logic Pro

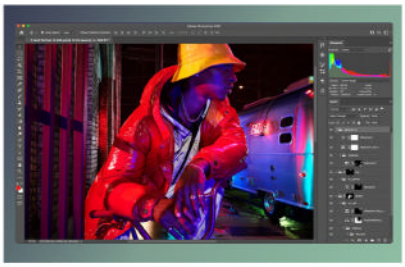
› £199.99 › apple.com/uk

› If you're serious about making music on your Mac, Apple's own Logic Pro is a must. It's great for songwriting, beat-making, music-editing and more. You can even go beyond stereo and create Spatial Audio compositions using its Dolby Atmos tools.

Final Cut Pro

› £299 › apple.com/uk

› Another pro-level Apple app, Final Cut Pro is excellent for video editing. It has incredible features that help you deliver professional results, such as object tracking, Cinematic mode and more. Its multicam features let you sync up to 64 angles of video at once.



Adobe Creative Cloud

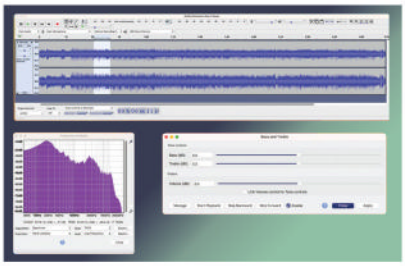
› £51.98/month › adobe.com

› Adobe's Creative Cloud is a suite of creative apps, such as Photoshop (image editing), InDesign (desktop publishing), Lightroom (photo management) and more. You can subscribe to individual apps if you don't want the entire suite.

Microsoft Office

› £119.99 › microsoft.com

› Microsoft's office suite gives you Word (word processor), Excel (spreadsheet), and PowerPoint (presentation) apps. It isn't as essential as it once was thanks to Apple's iWork suite offering Office compatibility, but some may prefer it.



Audacity

› Free › audacityteam.org

› This easy-to-use multi-track audio editor is free and open source. It can record live audio through a microphone or mixer, or digitise recordings from other media. It's packed with exciting features, and has some great audio effects.

› Image credits: Adobe, Apple Inc, Audacity, Microsoft

Best Mac for hobbyists

Mac Studio

Awesome power for enthusiasts and pros

The Mac Studio is the youngest member of Apple's Mac lineup. It has the same footprint as a Mac mini, though it's taller, more powerful and considerably more expensive. Something else it has in common with a Mac mini is it comes without a keyboard, mouse or trackpad; you'll have to supply these yourself. Obviously, you need a monitor too. All you get in the box is a power cord and the Mac... but what a Mac it is.

There are two off-the-shelf models to choose from. The cheaper one is based on an Apple silicon M2 Max chip, with a 12-core CPU, 30-core GPU, a 16-core Neural Engine, 32GB of unified memory and 512GB of SSD storage. The more expensive Mac Studio ups the specs to an M2 Ultra chip with a 24-core CPU, 60-core GPU, a 32-core Neural Engine, 64GB of unified memory and a 1TB solid-state drive (SSD).

Mac Studio £2,099
(Entry level)

Chip: M2 Max with 12-core CPU (8 performance cores, 4 efficiency cores), 30-core GPU, 16-core Neural Engine
Memory: 32GB (upgradeable to 96GB)
Storage: 512GB (upgradeable to 1TB, 2TB, 4TB, 8TB)
Ports: 4x Thunderbolt 4, 2x USB-C, 2x USB-A, HDMI 2.0, 3.5mm headphone jack, 10Gb Ethernet, SDXC card slot

Mac Studio £4,199
(Ultimate)

Chip: M2 Ultra with 24-core CPU (16 performance cores, 8 efficiency cores), 60-core GPU, 32-core Neural Engine
Memory: 64GB (upgradeable to 192GB)
Storage: 1TB (upgradeable to 2TB, 4TB, 8TB)
Ports: 4x Thunderbolt 4, 2x USB-C, 2x USB-A, HDMI 2.0, 3.5mm headphone jack, 10Gb Ethernet, SDXC card slot

With stats like that, it's clear the Mac Studio is for professionals and hobbyists with high-end needs. It's perfect for those who want a huge amount of computing power but can't afford – or don't need – a Mac Pro. If you're a professional designer, do lots of photo editing, or need to compile code quickly, then the Mac Studio is for you.

As it's light and compact, it's great if you want to carry it between work and home, just like the Mac mini. The power cord is cheap and easily obtainable, so if you set up a screen, keyboard, mouse or trackpad, and a power lead at both locations, all you need to do is carry the computer between the two. The Mac Studio is 19.7cm square, 9.5cm tall and weighs 2.7kg for the cheaper model and 3.6kg for the higher-specced version, so it will fit in most work bags.

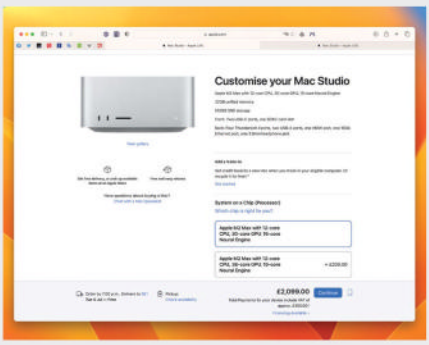
1 **Thunderbolt 4 ports**
These ports also support DisplayPort, USB 4 (up to 40Gb/s) and USB 3.1 Gen 2 (up to 10Gb/s).

2 **Ethernet and power**
For cabled networking, there's a 10Gb Ethernet port. Next to this is the power socket, for the power cable.

It's great for connectivity too. At the back it has four Thunderbolt/USB 4 ports, two USB-A ports and HDMI for a display. There's also a 10Gb Ethernet port for wired networking and a 3.5mm headphone jack. At the front there's an SDXC card slot with an UHS-II (Ultra High Speed) rating, which is capable of transfer speeds of up to 312MB/s. On the

Upgrade options

With a computer as powerful as the Mac Studio, you might be satisfied with the off-the-shelf version. Nevertheless, you can still expand and customise your purchase at the Apple Store. The Mac Studio offers no more space than other Macs, but if you want extra internal storage, you can upgrade it to up to 8TB. Both the cheaper and the more expensive Mac Studio models offer processor upgrade options, with the top system-on-a-chip being an Apple M2 Ultra with 24-core CPU, a 76-core GPU and a 32-core Neural Engine. The cheaper model can be upgraded to 64GB of unified memory, while the high-end one can reach an amazing 192GB. As always, you can opt to have Logic Pro and Final Cut Pro software preinstalled.



Head to the Apple Store and you'll be able to power up your Mac Studio even further.

Image credit: Apple Inc

3
USB-A ports
› These ports are relatively slow at only up to 5Gb/s, but a lot of peripherals and add-ons will still use them.

4
HDMI & headphones
› Connect to a monitor with HDMI and plug in headphones or speakers using the 3.5 mm socket.

cheaper Mac Studio there are also a couple of USB-C ports with speeds of up to 10Gb/s. On the top-of-the-range model, these are replaced by twin Thunderbolt/USB 4 ports that can manage up to 40Gb/s. This isn't a perfect layout. We'd rather the headphone socket was around the front where it's easier to reach, along with the USB-A ports, so it'd be easier to plug in and remove temporary storage such as flash drives or portable drives.

Workhorse Mac

Despite the layout imperfections, the Mac Studio is a fine machine. Its blistering power, connectivity options and portability make it ideal for Mac users who need to take their computer between locations. Task-wise, it's perfect for design work, software development and video editing. It's also great for the home, assuming you need that much power. Actually, it's great even if you don't; who doesn't love an overpowered Mac?

5 best add-ons for the Mac Studio

As always, the peripherals and accessories listed here can be used on any Mac, but we think they'd be especially useful when paired with a high-performance computer like the Mac Studio. A high-end computer typically requires a high-end screen; if you're a designer you might want an A3 printer; and, for extra storage, you could benefit from an external, portable SSD.

Apple Studio Display

› From £1,499 › apple.com/uk

› This 27-inch 5K Retina display has outstanding camera and audio. On top of the screen you'll find a 12MP Ultra Wide camera with Centre Stage. There are also six speakers with Spatial Audio and, needless to say, the screen itself is absolutely gorgeous.

Epson Expression Photo HD XP-15000

› £299.99 › epson.co.uk

› For photos or designs of up to A3 size this printer produces professional glossy prints, thanks to six colour Claria Photo HD Inks with red and grey. It has a suite of mobile-printing apps and a large LCD display too.

WD My Passport SSD

› From £74.99 › westerndigital.com

› This handy external solid-state drive is available in different capacities of 500GB, 1TB, 2TB or 4TB. It's available in five different colours (except the 4TB version), and it read speeds of up to 1050MB/s and write speeds of up to 1000MB/s. Impressive stuff.

Edifier S3000Pro Wireless Speakers

› £629.90 › edifier.com

If you listen to music while using your Mac, these high-end speakers are just what you need. They feature Bluetooth 5.0 with Qualcomm aptX HD decoding, and can be used wirelessly or through a variety of cabled options.

Logitech 4K Pro Magnetic Webcam

› £169.99 › logitech.com

› If your monitor lacks a built-in webcam – or even if it has – you can video conference and more with this Ultra HD model from Logitech. It has a magnetic mount to keep it in place, and it connects to your Mac via USB-C.

› Image credits: Apple Inc, Edifier, Seiko Epson, Logitech, Western Digital Corporation

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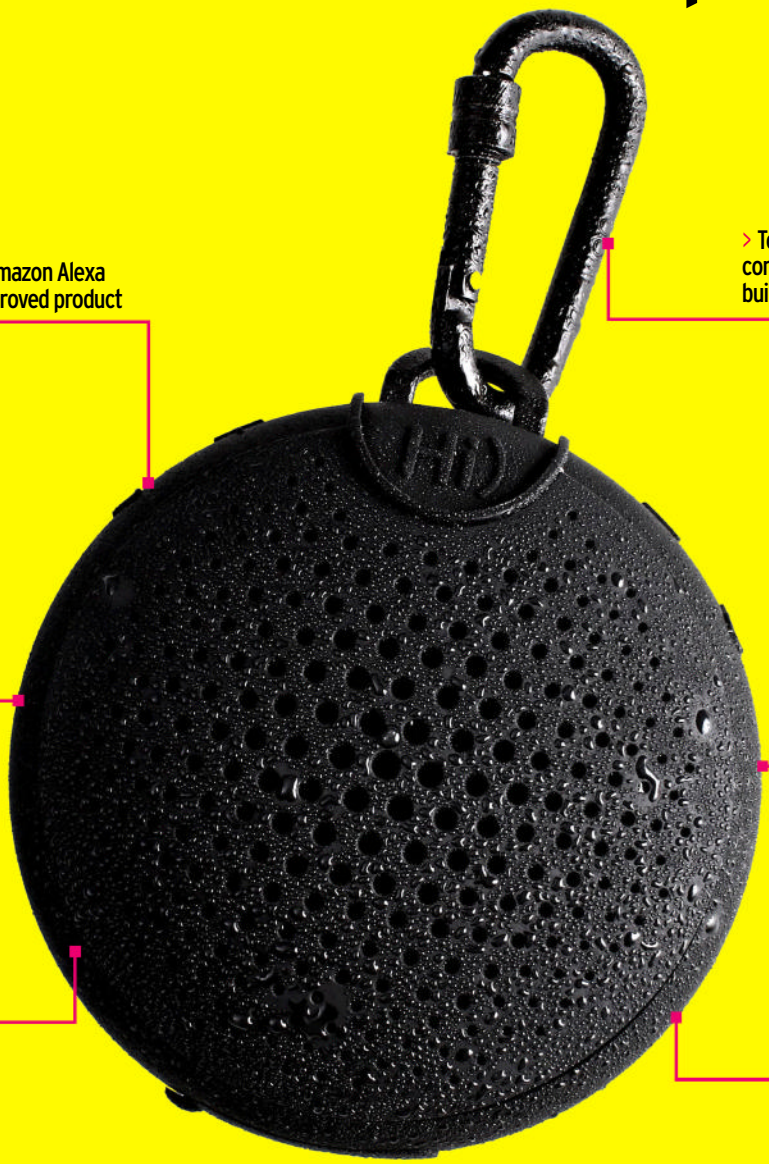

- Amazon Alexa approved product
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EDITED BY **JO MEMBERY**

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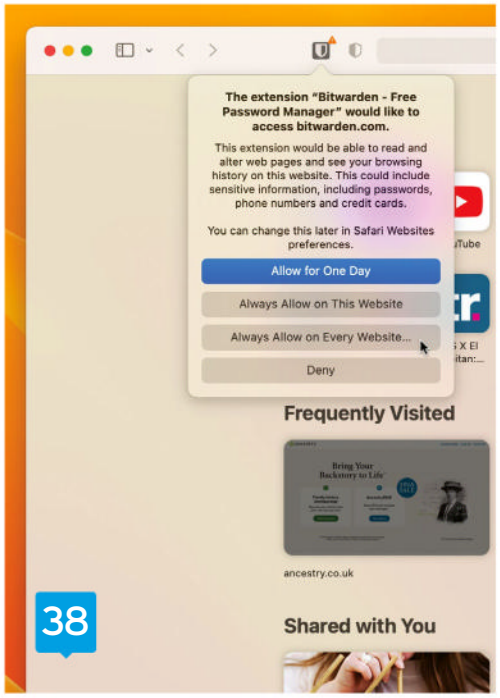
Master Apple shortcuts

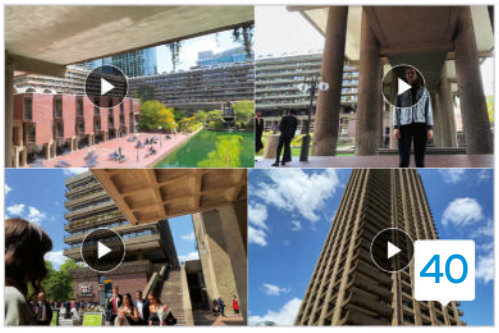
macOS

- *Cmd* is the Command key.
- *Alt* or *Opt* is the Option key.
- *Ctrl* is the Control key, also shown as '^' in shortcuts in the menu bar.
- The thick, outlined up arrow is the Shift key.
- The thin, left arrow or outlined pointer with 'X' inside is the Delete key, which deletes to the left. Pressing the Function key (Fn) and the Delete key deletes to the right.
- The thin, right arrow key with a small vertical line at the end is the Tab key, which shifts the focus between *some* controls.

iOS

- A *tap* is a brief contact of (usually) one finger on your device's screen.
- To *drag* is to move a finger across the screen to scroll or pan around content.
- *Swipe* means move one or more fingers across an item or the screen, then let go.
- A *flick* is like swiping, but it's quicker, and is often used to scroll content more quickly.
- *Pinch* means move two fingers together or apart, usually to zoom in or out.
- *Touch and hold* means lightly rest your finger on an item and wait for a reaction.





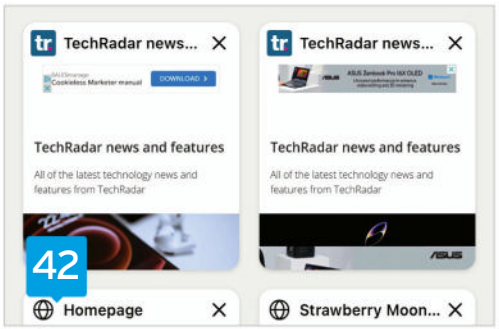


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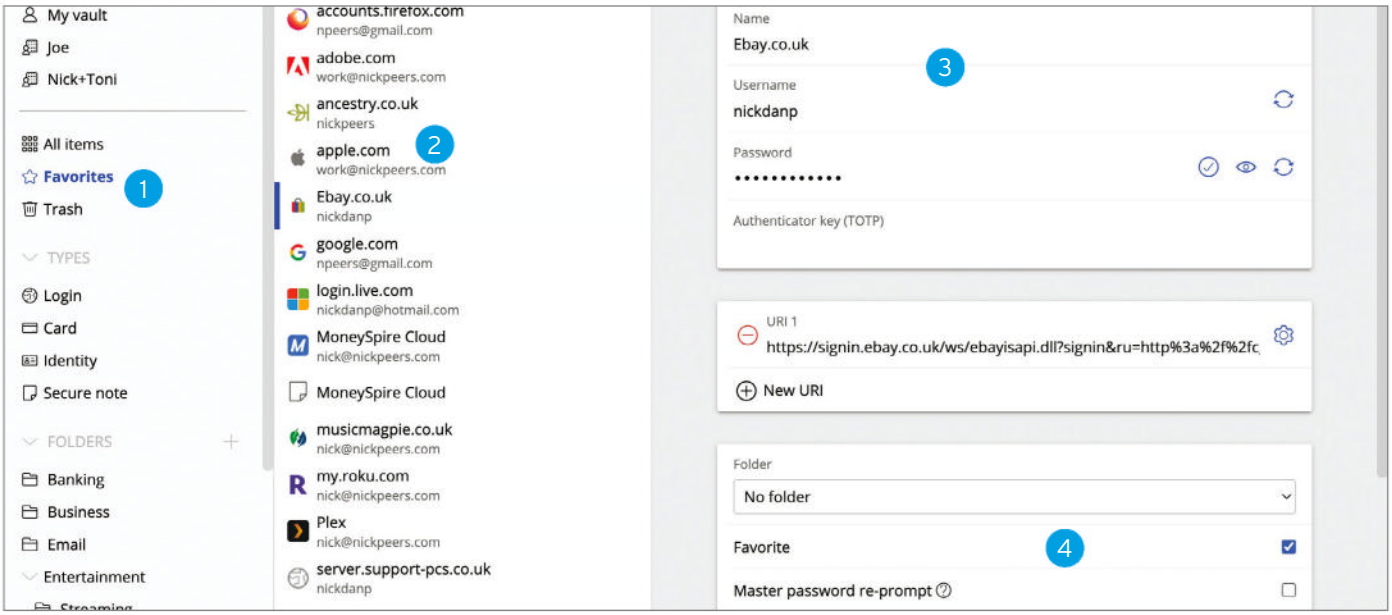
Image credits: Apple Inc, Adobe, Bitwarden Inc, Ecosia GmbH



1 **Organise logins**
› There are various ways to organise your logins – by folder, type and by marking some as favourites.

2 **Find your login**
› Logins matching the current view (or search terms) are shown here – simply select one to view it.

3 **Make changes**
› You can manually edit key details like the login's name and URL(s) – the websites it appears on.

4 **Store more details**
› You can set special conditions, plus attach more information – notes and custom text fields too.

Create strong passwords

Discover how to get started with Bitwarden's free password tool

IT WILL TAKE
› 15 minutes

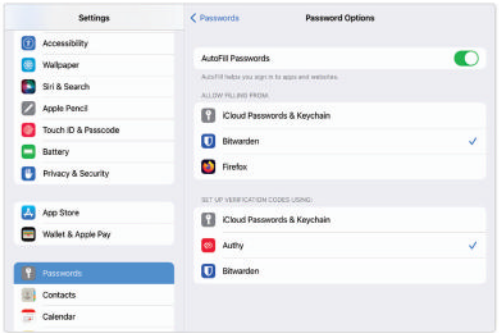
YOU WILL LEARN
› To set up and use Bitwarden on Safari

YOU'LL NEED
› Bitwarden account and app(s), macOS 10.14 or later, Safari

Genius tip!

› Make frequently accessed logons more visible by ticking the Favourite box when editing so they appear at the top of the list under Vault.

One password manager to rule them all. That's the dream, and Bitwarden is the reality! It's free and open source, works across your devices and has everything you'd normally find in an expensive alternative such as LastPass or 1Password. There is a Premium tier, but it's only $10 (about £9)/year) and no core functionality is locked behind it. The free version works across all your computers, web browsers and mobile devices.



Once installed on your iPad or iPhone, head to Settings > Passwords > Password Options to make Bitwarden your default manager.

Bitwarden is easy to set up, can be integrated as your default password manager and, if you don't trust the cloud, you can even set up your own self-hosted instance (more on how to do this next issue).

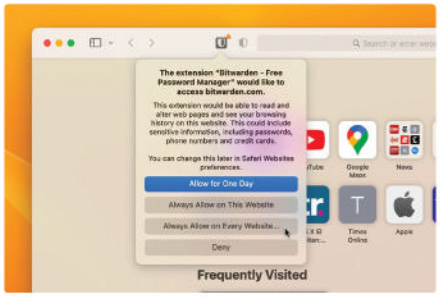
First, sign up for a free account. Head over to bitwarden.com and click Get Started Today where you'll be prompted to register. You need to supply your email address, name and a master password. This will be the last password you need to remember, so it needs to be memorable, but not short or guessable. You can head to bitwarden.com/password-generator and use it to generate a 'passphrase' (three random words).

Accessing Bitwarden

You can log into your vault through any web browser at vault.bitwarden.com, but a better bet is to install the desktop app (and Safari extension) from the Mac App Store. Other web browsers are also supported – visit bitwarden.com/downloads for direct links to these, plus don't forget to install the free iPhone and iPad apps too. **Nick Peers**

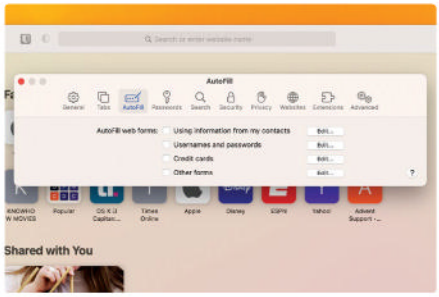
› Image credits: Apple Inc, Bitwarden Inc

HOW TO Use Bitwarden in Safari ›



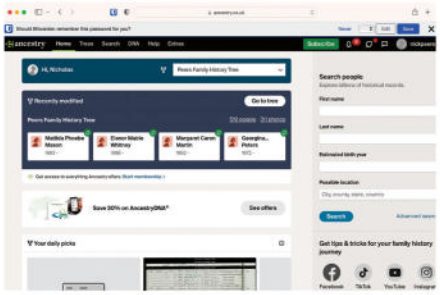
1 Enable Safari extension

After installing the desktop app, launch Safari and click Turn On Extension when prompted. Click the Bitwarden icon and choose 'Always Allow on Every Website' twice before clicking again to log into your account.



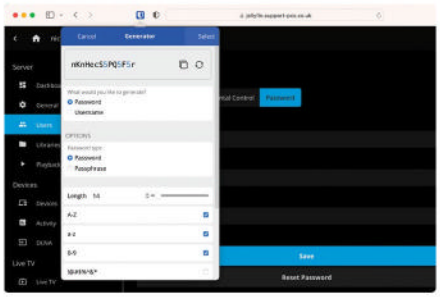
2 Disable auto-fill

Open Safari › Preferences › AutoFill and untick all four entries as shown to disable Keychain. Bitwarden supports autofill, but note the warning under Settings › AutoFill; use the Cmd+Shift+L shortcut instead.



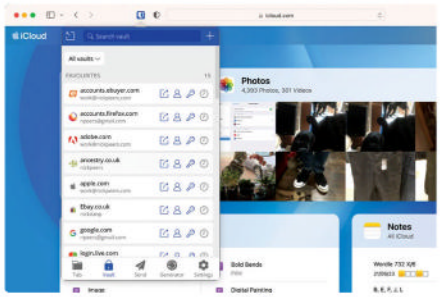
3 Save existing passwords

When you next log into an existing account, Bitwarden should detect you've done so and offer to save the login details. Click Save – you'll see a small number appear above the Bitwarden icon indicating that it's been saved.



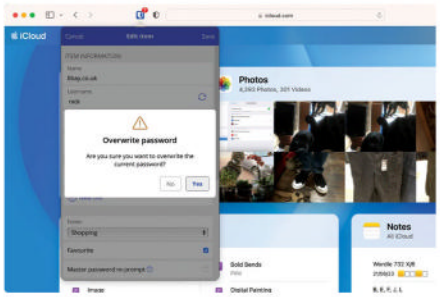
4 Generate passwords

When signing up for a new account, open Bitwarden and click 'Add a login'. Fill in the details (name, username), then click 'Generate password' followed by Select. Click Save followed by Ctrl+Shift+L to use it.



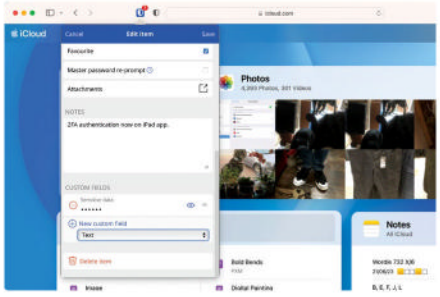
5 Edit login info

You can edit your login info – say, after updating a password online. Open Bitwarden, locate your login details (click Vault or use the 'Search vault' tool if necessary), then click the View button followed by Edit.



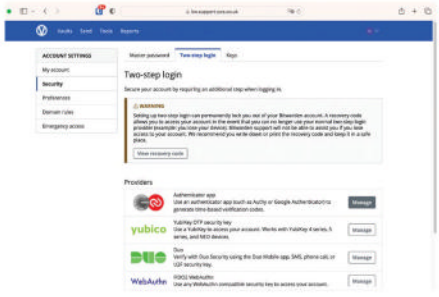
6 Make changes

You can manually edit fields, or – in the case of the password – generate a new random one by clicking the button on the right. Click Yes to overwrite the current password, which will be kept under 'Password history'.



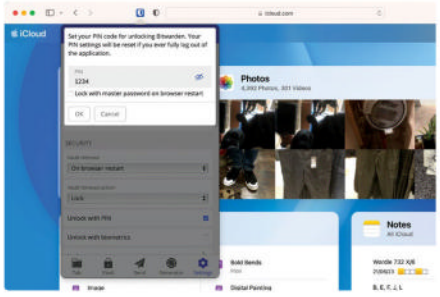
7 Record more info

Scroll down and you'll see space to record more information – there's a simple Notes field, plus you can add dedicated fields to store other info; choose Hidden to hide sensitive information. Click Save when done.



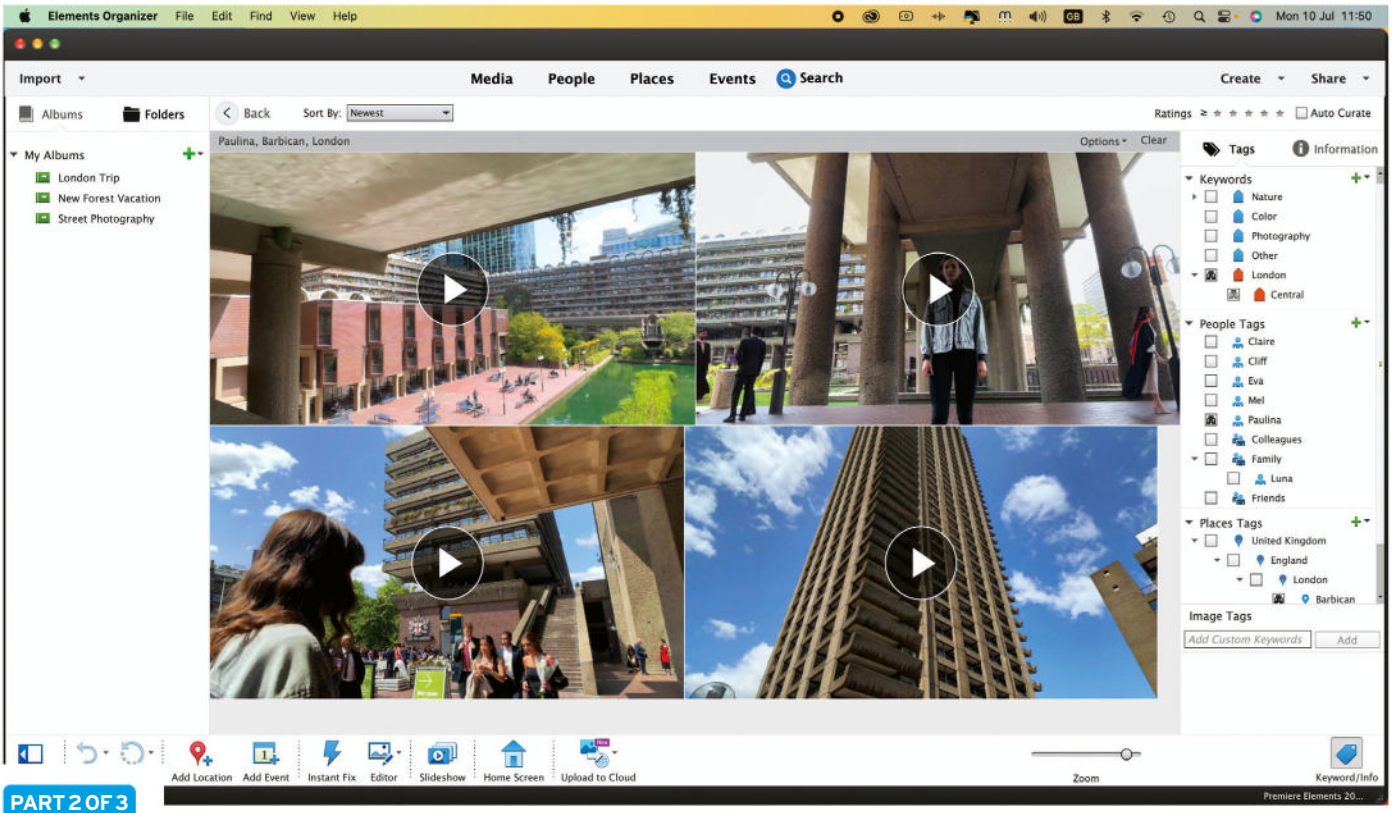
8 Secure your account

If your master password is leaked, anyone could gain access to your account. Log into vault.bitwarden.com and navigate to Account Settings › Security › 'Two-step login' to set up two-factor authentication (2FA).



9 Unlock with PIN

Save time logging back into Bitwarden by unlocking the extension with a PIN: open Bitwarden, click Settings, tick 'Unlock with PIN' and enter a PIN code. Untick 'Lock with master password' only if your Mac is secure.



PART 2 OF 3

Take control of video clips

Use Elements Organiser to find the best clips to edit in Premiere Elements

IT WILL TAKE
› 15 minutes

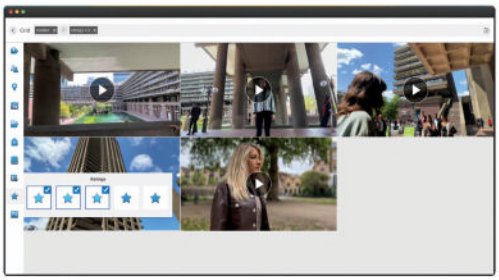
YOU WILL LEARN
› How to use the Elements Organiser to managed your clip collection

YOU'LL NEED
› Adobe Premiere Elements 2023, (£86.56), macOS 11 or later

With an ever-growing collection of video footage it can be a time-consuming challenge to find specific clips. Fortunately, the Elements Organiser is packed full of tools to help you take control over your video collection so you can locate and export the best clips to edit in Premiere Elements.

Better selection

By default, Elements Organiser stores clips chronologically, but this relies on your memory to find a particular clip. With a little bit of housekeeping as you import your footage you can make it much easier (and faster) to find specific video clips in the future.



You can choose to search for a clip via a combination of keywords and star ratings,

We'll show you how to create and assign keyword tags that reveal specific clips in a click. You'll also learn how to pop clips into albums or manually geo-tag them on a map so you can choose the best ways for you to find your footage.

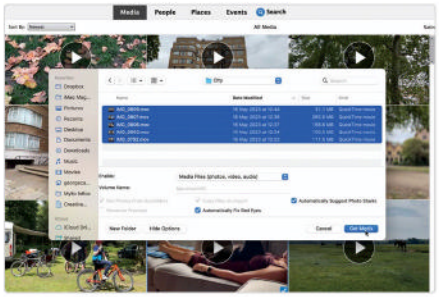
You'll also learn how to assign variable star ratings so you can quickly filter through your clips at a later date to find the best ones to edit. The Organiser will even automatically generate Smart tags based on a clip's content (such as 'Ocean' or 'Horses') but it does take a little while for Adobe's Sensei AI to trawl through every frame of your footage before it can create suitable Smart tags.

The steps in this walkthrough show you a range of ways to manually and automatically tag your clips, so you can ensure that you always find the best clips for your Premiere Elements projects.

George Cairns

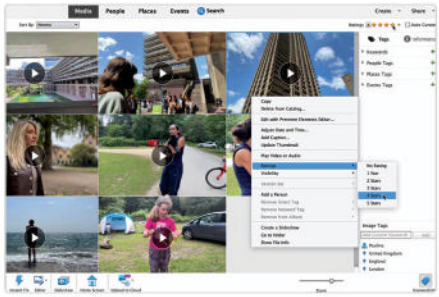
› Image credits: Apple Inc, Adobe

HOW TO Organise and locate your clips ›



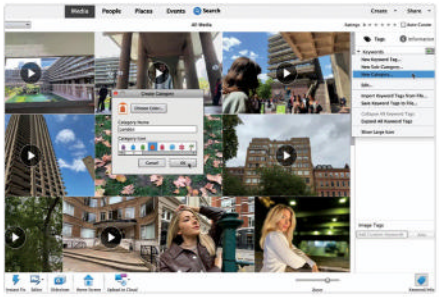
1 Import clips

In Premiere Elements 2023, click the Organiser button at the bottom. Choose File › Get Photos and Videos › From Files and Folders. Browse to select some clips and click Get Media. This imports the clips into the Organiser.



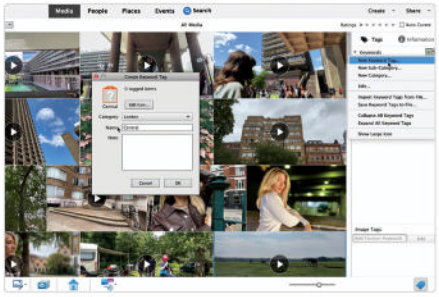
2 Assign ratings

Video clips are indicated by a 'play' icon. Ctrl-click on a clip and choose Play Video to view it. Then, click on Ratings and assign a star rating. You can then select a star rating at the top right to reveal all clips with that rating.



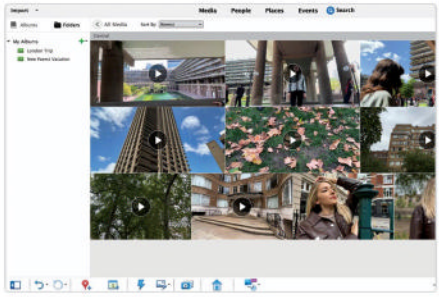
3 Create category

In the Info panel at the right, toggle open Keywords. Click the green '+' and choose Create Keyword Tag. Choose Create Category. Label the category (such as 'London') and choose a colour label for it. Click OK.



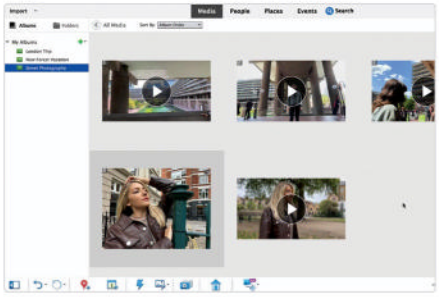
4 Create keyword

Click the green '+'. Choose New Keyword tag. In the Create Keyword tag dialog set Category to 'London'. Type a name, such as 'Central'. Click OK. Now you can drag the Central keyword tag on to any appropriate clips.



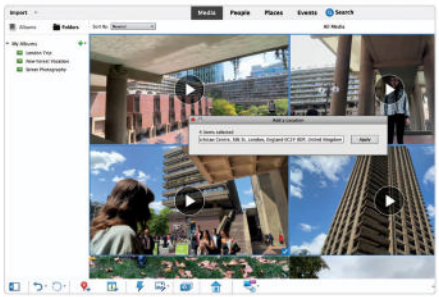
5 Filter by keyword

Click in the grey box next to the 'Central' keyword tag to display all clips containing that keyword. You can also use the same steps to create, assign and search for keyword tags in the Info panel's People section.



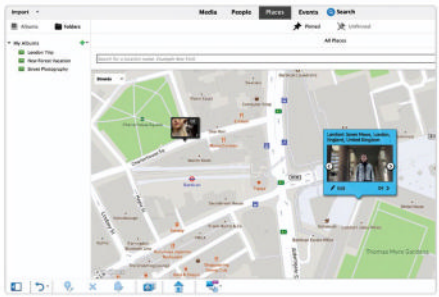
6 Add an album

Click on Albums. Click the green '+' next to My Albums. Choose New Album. Name the Album. Click All Media. Cmd-click on the relevant clips. Drag them to the new Album. Click the Album to view its contents.



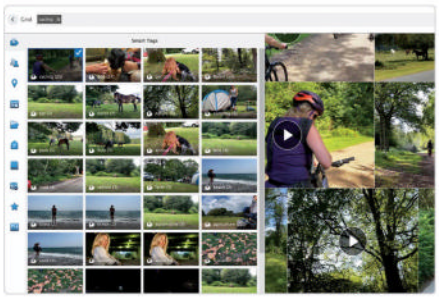
7 Create a place tag

In the Media tab, click on a clip. Click the Add Location button. Type in the name of the location. Press Return. A list of locations will appear from a pop-up menu. Click to select the most appropriate one. Then click Apply.



8 Locate a place

Tick the box by a Places tag to view files captured at a specific location. You can also view clips on the Places map. If more than one clipped is tagged, scroll through the thumbnails or double-click to view them.



9 Get smart

Click on Search at the top. Here you can search for clips based on People, Places, Dates, Albums and Keywords. You can also click Smart Tags to find AI-tagged content such as Cycling, Camping and Ocean.

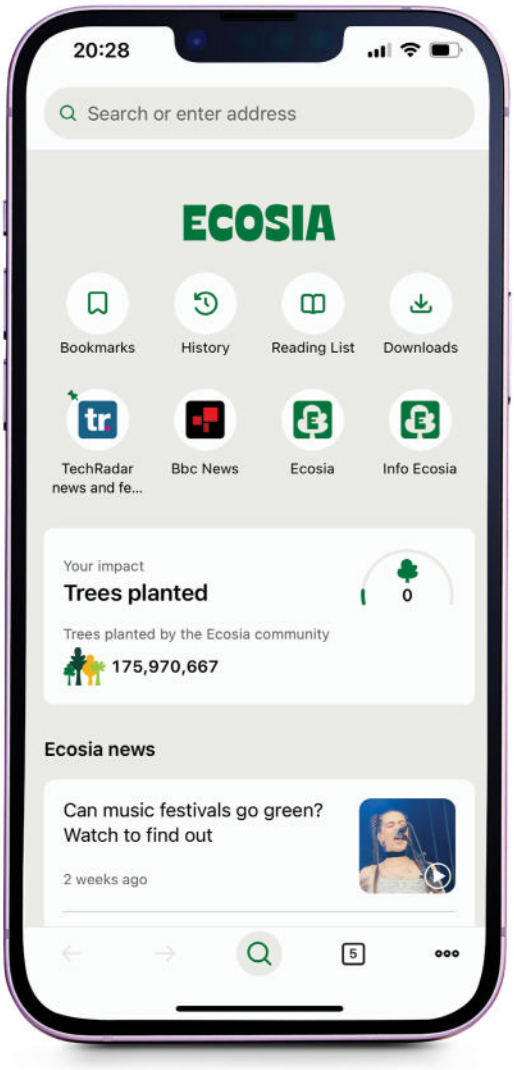
Use Ecosia to browse privately and sustainably

Save the world and boost your privacy with this eco-friendly browser

IT WILL TAKE
› 30 minutes

YOU WILL LEARN
› How to use Ecosia on Mac, iPhone and iPad

YOU'LL NEED
› Ecosia web extension for Mac/Ecosia app for iOS (Free), iOS 13 or later



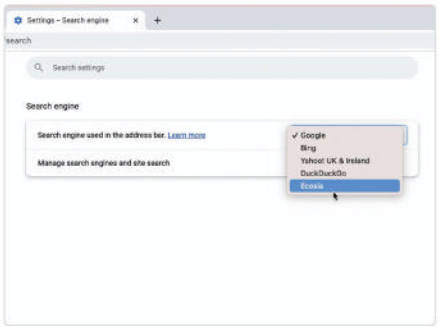
There's no shortage of web browsers for Mac, iPhone or iPad. Even if you ignore the big three of Safari, Chrome, and Firefox, there are plenty of options. If you want to look beyond the usual attractions of speed and features, you should give Ecosia a try.

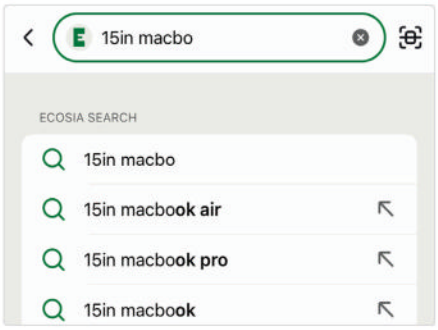
Technically, Ecosia is a search engine. But it has an app for iOS and iPadOS, and an extension for Safari on Mac, that provide the basic features you need in a web browser.

What makes Ecosia different is that it doesn't push you to set up a user account and it doesn't want your private data. Most importantly of all, when you search the web using Ecosia, it earns revenue for the traffic you provide and it uses that revenue to plant trees. It's a sound idea. Everything we do on a computer uses energy, and that energy, even if it's from a sustainable source, has a carbon cost associated with it. By planting trees, Ecosia helps to offset that cost. Here's how to get the best from it on your devices.

Kenny Hemphill

HOW TO Browse in a private, sustainable way ›





1 Use on Mac Safari

Using Ecosia in Safari on Mac is easy. Open a new tab or window, click on the magnifying glass in the address bar and choose Ecosia from the list of search engines. Then type your search query.

2 Various browsers

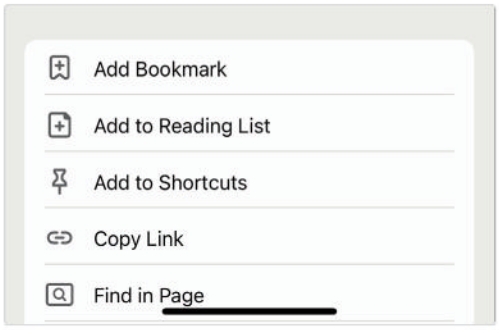
You'll need to download and install an extension from the Chrome or Firefox extensions stores to use Ecosia. If you use Brave, Vivaldi, or Microsoft Edge you can choose Ecosia in settings.

3 Search on iPhone

To use Ecosia on an iPhone or iPad, you'll need to download the app from the App Store. Once done, launch the app and type a query or a web address into the search bar at the top of the screen.

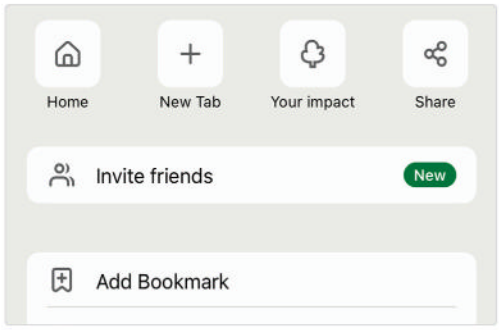
› Image credits: Apple Inc, Ecosia GmbH

CONTINUED... Browse sustainably >



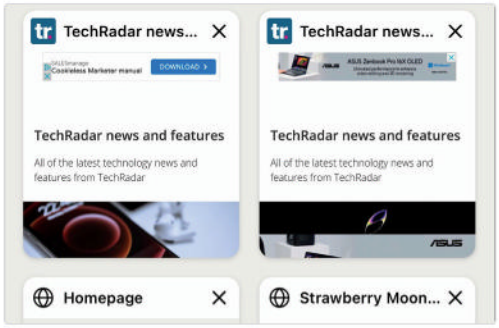
4 Bookmark on iPhone

Ecosia is a browser on iPhone and iPad, so you'll need to learn how to use its features if you intend to use it regularly. To bookmark a page, tap the '...' at the bottom of the screen and choose Add Bookmark.



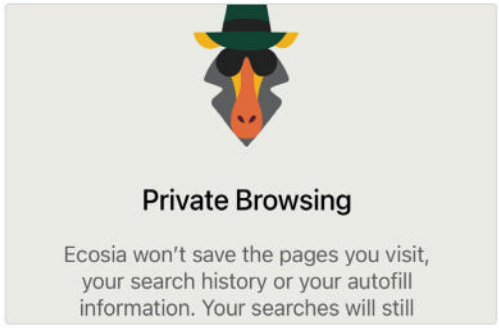
5 Use more features

As well as adding bookmarks, you can add a page to Ecosia's new tab page. Tap the '...' and choose Add Shortcut. From here, you can also add a page to your reading list, copy a URL and search for text on a web page.



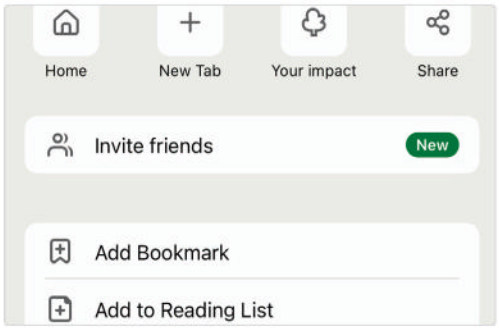
6 Manage tabs

To view open tabs in the Ecosia app, tap the rectangle in the toolbar (it has a number in it indicating the number of open tabs). To open a new tab, tap the '+' or to close a tab, tap the 'X' in its top right-hand corner.



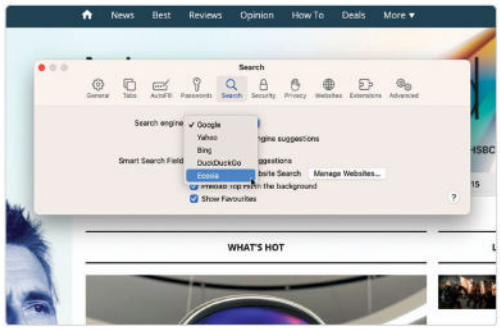
7 Browse privately

When you browse privately, Ecosia doesn't save the pages you visit, your search history, or autofill information. To browse privately in the app, tap the tabs button in the toolbar then tap Private, and '+' to open a private tab.



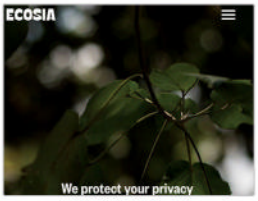
8 View in reading mode

Navigate to a site that supports reading mode and tap the book icon at the right of the address bar. To save a page to your reading list, while in reading mode, tap the '...' and choose 'Add to Reading List'.



9 Set Ecosia as default

In iOS, tap Settings then Ecosia. Tap Default Browser App and choose Ecosia. To set Ecosia as the default search engine in Safari on Mac, tap on Safari > Settings > Search and choose Ecosia from the Search Engine menu.

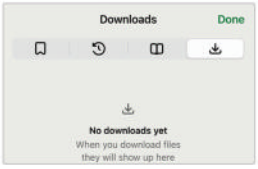


Good to know

> Ecosia doesn't use third-party tracking tools like Google Analytics, encrypts searches and doesn't save them, and doesn't sell data to advertisers.

Genius tip!

> Ecosia's homepage on iOS has a Downloads section. You'll find any files you download in Ecosia here.

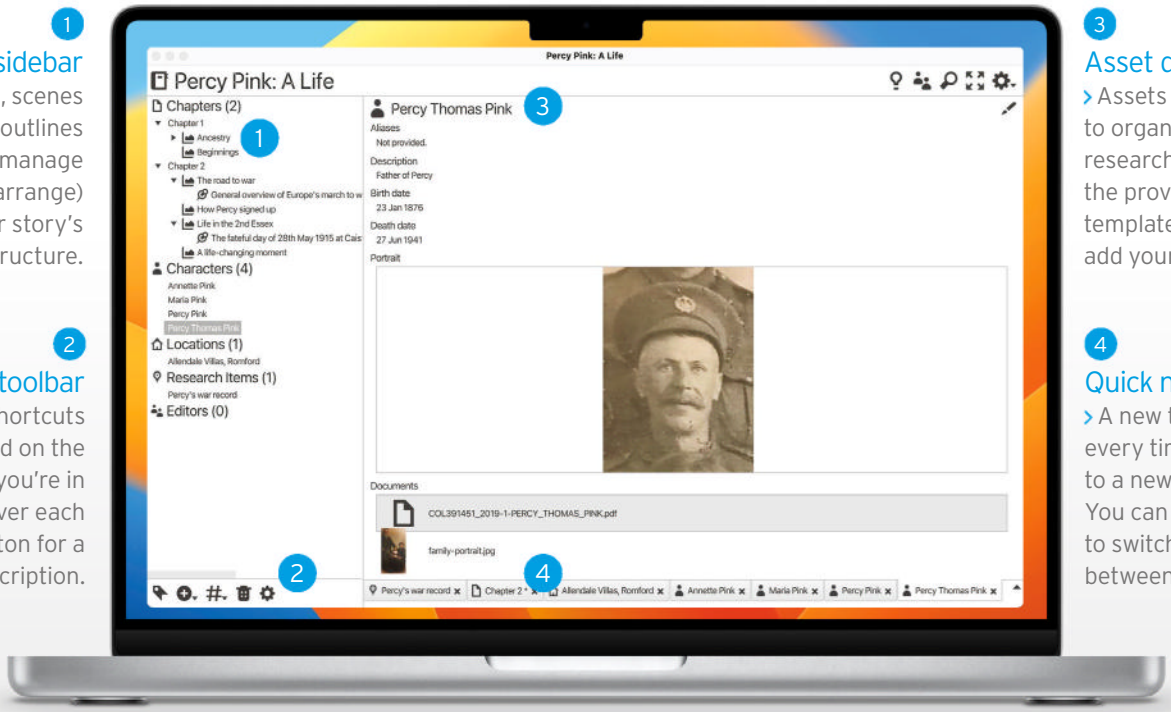


Genius tip!

> In Safari, the tree icon at the top right of Ecosia's search page shows you how many trees you've planted. In the iOS app, it's on the homepage.

1
Project sidebar
› Chapters, scenes and plot outlines help you manage (and rearrange) your story's structure.

2
Shortcut toolbar
› Provides shortcuts based on the current tab you're in – roll over each button for a description.



3
Asset details
› Assets allow you to organise your research – use the provided templates, plus add your own.

4
Quick navigation
› A new tab opens every time to move to a new section. You can use these to switch quickly between them.

Finally write that book!

Take a half-formed idea and transform it into a finished story

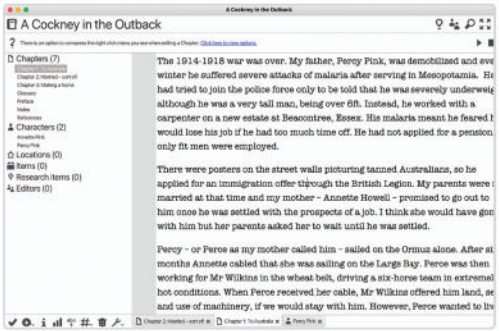
IT WILL TAKE
› 30 minutes

YOU WILL LEARN
› Plan, organise and write a story with Quoll Writer

YOU'LL NEED
› Quoll Writer (Free), macOS 12 or later, a story idea or two!

Quoll Writer helps you plot, organise, and bring together research material

If you've a great idea for a story, but no idea how to start it (never mind finish), you need Quoll Writer. This free and open-source tool is a writer's boon. The software packs in all the tools you'd expect from a paid-for app, to help you plot and organise, bring together research material and finally help you deliver compelling prose your readers won't want to put down.



Quoll Writer's interface looks simplistic but there's plenty there to help you get your ideas in order.

The program makes it easy to manage everything – your notes, research materials and story itself – from a customisable two-pane window. And when you have everything lined up, you can evoke Quoll Writer's distraction-free mode to focus on your writing.

Download Quoll Writer (quollwriter.com), open the DMG package and drag Quoll Writer into Applications. On first launch you'll be told it's blocked – it's safe, so go to System Settings › Privacy & Security and click Open Anyway.

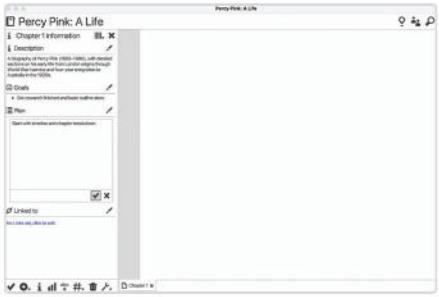
The step-by-step guide reveals how to master the basics of Quoll Writer. We've barely scratched the surface of what it's capable of – visit quollwriter.com/user-guide/getting-started.html for a detailed guide to help you do more. When you're done, click Settings and choose Export Project to save your finished story in Microsoft Word (.docx) or ebook-friendly EPUB format. You can export all or part of your story, along with any research notes you might wish to include, which will be saved in a separate file. **Nick Peers**

› **Image credits:** Apple Inc, Gary Bentley

HOW TO Write your first story ›

1 Create your first project

After running through the set-up wizard – which includes choosing your spellchecker language – choose 'Create a Project' and click Next to give it a name, choose where it's saved, and whether to encrypt it for security.

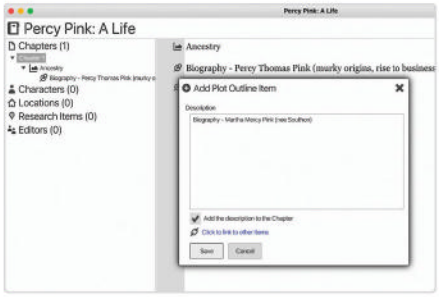


2 Set goals

Quoll Writer's main screen will open. Before typing anything, click the 'i' button in the Shortcut toolbar to access the chapter's information sidebar, where you can add a description, set goals and link to assets.

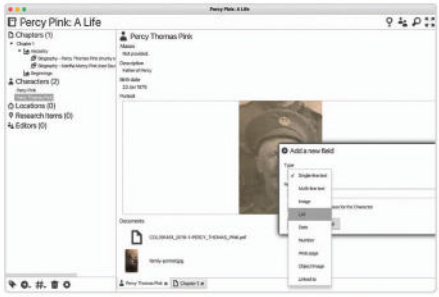
3 Split your chapter

Ctrl-click inside the text editing window and choose New › Scene to divide chapters into sections in the Project sidebar. Type your story beneath a scene's header, and drag and drop scenes to change the running order.



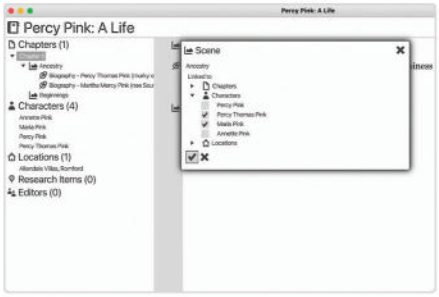
4 Add a plot outline

You can also Ctrl-click and choose New › Plot Outline to further break up chapters and scenes using rough outlines, which help you move your plot along without having to finish writing the full story there and then.



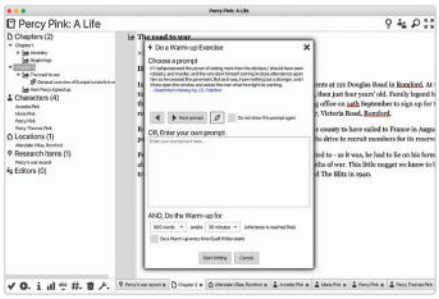
5 Organise your research

Record notes using characters, locations and research item asset types. Fill in basic info (name, description), then Ctrl-click and choose 'Add a new field' to record more information, such as document links, images and more.



6 Link it all together

Create a dedicated Links field to allow you to link one asset to another. Link assets to chapters via the Chapter information sidebar, or click a Scene as shown in the screenshot to link multiple assets to that scene.

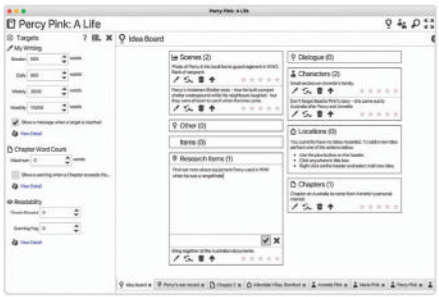


7 Evoke writing aids

Once planned out, Quoll Writer also offers various aids to the writing process – the built-in spellchecker for one, but also warm-up exercises (click the Settings button to access this) as well as a Find Problems tool.

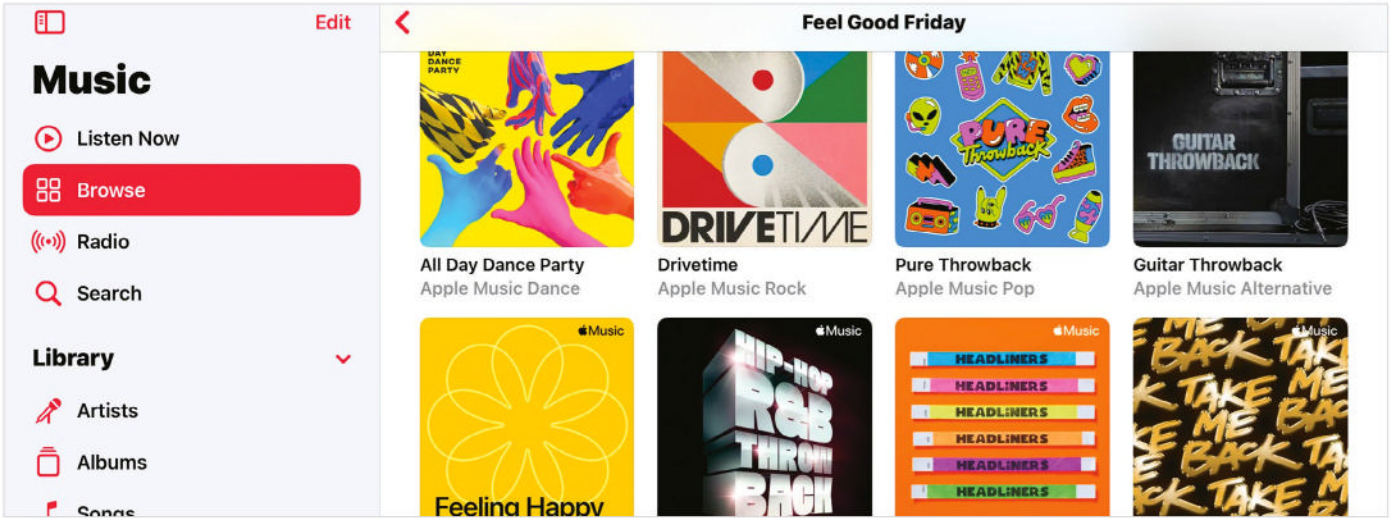
8 Focus in full-screen

When you are warmed up and keen to get a chunk of writing done, click the full-screen button next to Settings. Roll your mouse up to the top to reveal a slide-out menu – click the headphones for distraction-free mode.



9 More tools and tips

Quoll Writer also includes a stats tool with readability score, Idea Board for taking notes, and a free Editor's Service where you can swap feedback. Click Options › 'How things look and sound' to customise the interface.



Master the Music app on iPad

Enjoy music anywhere at home or on the go on iPad

IT WILL TAKE
> 10 minutes

YOU WILL LEARN
> How to make the most of the Music app on iPad, and access iTunes purchases too

YOU'LL NEED
> iPadOS 16 or later, Music app, Apple Music subscription (optional)

Of all the versions of the Music app available on Apple devices, the iPad version is our favourite. It's simpler to use than the Mac app, and less cramped than the one on iPhone, and it offers the best features of both. Better still, the Music app on iPad makes the most of your tablet's bigger screen with a great-looking interface that puts all the key features easily at your fingertips.

To enjoy music on on your iPad you will need at least one of three things: an Apple Music subscription (from £10.99/month); an existing Music library on Mac that you can sync your iPad with using either a cable or over Wi-Fi; or a subscription to iTunes Match (£21.99/month), which puts your music library in the cloud, so you can access it anywhere you can get an internet connection.

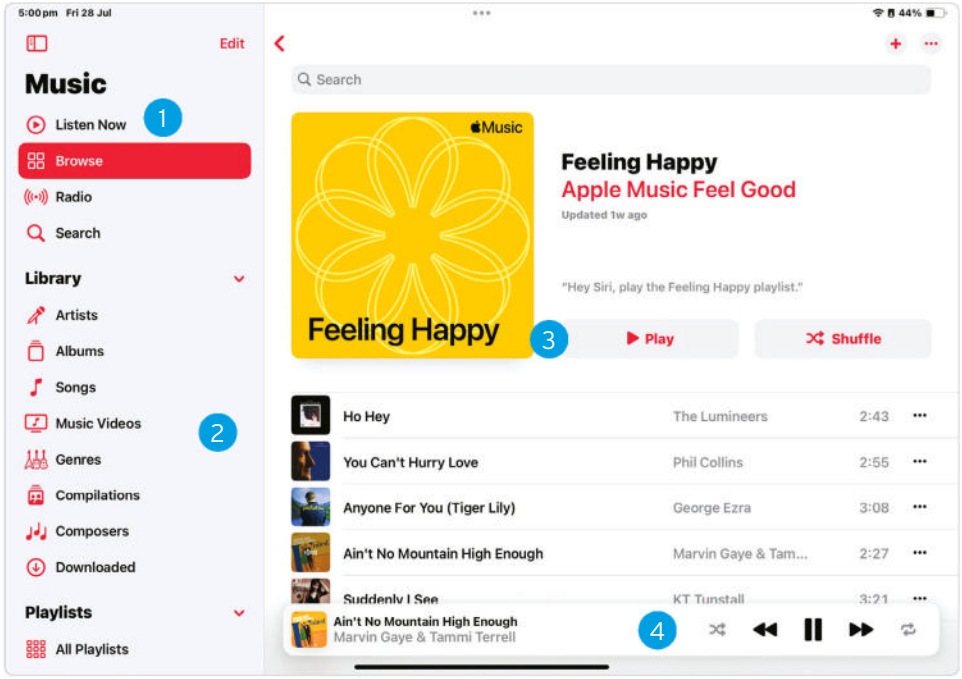
In this tutorial, you'll discover many of the great things you can do with the Music app on iPad – from creating custom playlists to indulging in a spot of karaoke. Plus, we'll show you how you can download and enjoy your existing iTunes Store purchases too.

Rob Mead-Green

EXPLAINED... The Music app on iPad >

1 Apple Music
> Tap Listen Now, Browse or Radio to access the thousands of tracks available on Apple's music service.

2 Library
> The songs you own arranged by Artist, Songs, etc. Downloaded contains the songs stored on your iPad.

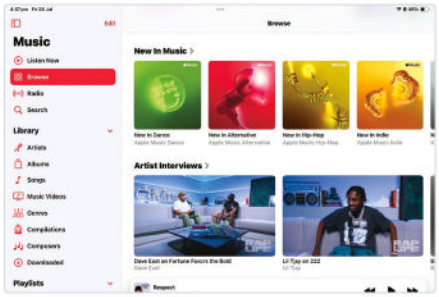


3 Main window
> What you see here depends on whether you're looking the Apple Music or your personal music library.

4 Playback
> This floating window shows the currently playing track. Tapping here invokes the full-screen view.

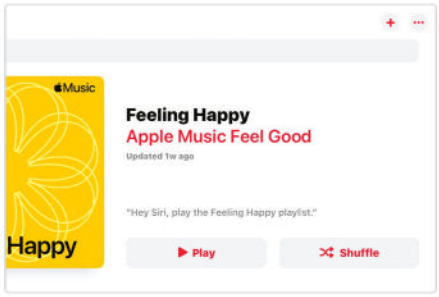
> Image credits: Apple Inc

HOW TO Listen to Music on your iPad



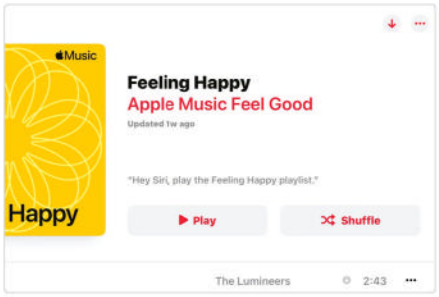
1 Cue the music

Looking for something to listen to? Tap Listen Now, Browse or Radio under Music in the sidebar to see the thousands of songs, albums, playlists and stations available on Apple's music streaming service. Tap one for more details.



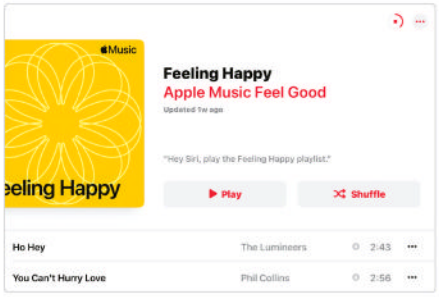
2 Pop goes the playlist

Here we've chosen the 'Feeling Happy' playlist. Tap the Play button at the top to play the tracks in order. Or Tap shuffle for a randomised selection. To add the playlist to your library, tap the '+' button in the top-right corner.



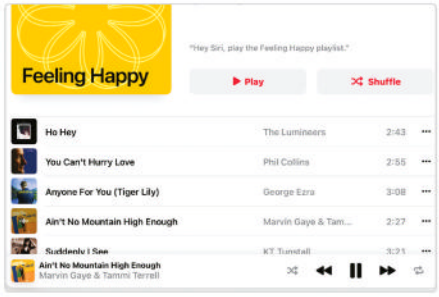
3 Stream the playlist

The '+' button in the top-right corner has now been replaced by a down-arrow button. This means the playlist has been added to your music library, but not yet downloaded. Pressing the Play button now will stream the tracks over the web.



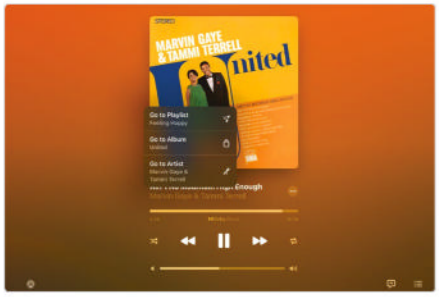
4 Download the playlist

To download individual tracks from the playlist to your iPad, tap the down-arrow button to the right of each track listing. Or, to download the lot, tap the down-arrow button (top right of the playlist) that we mentioned in step 3.



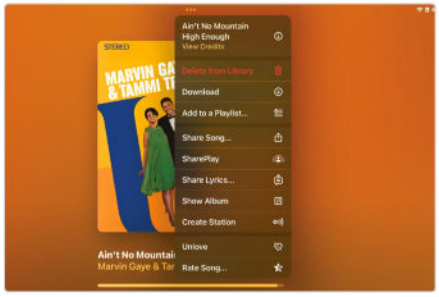
5 Play a selected track

Here we've selected a track from the playlist that we want to listen to first. It'll appear in a floating window at the bottom of the screen. For a more detailed view, tap the floating window. You'll now see a full-screen playback view.



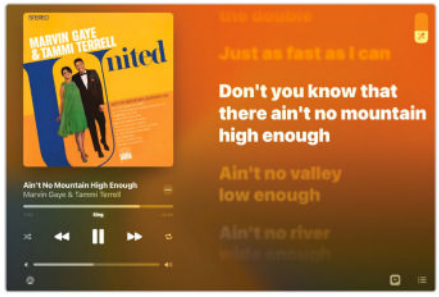
6 Full-screen view

Here's you'll see the album artwork, playback controls in the centre and a few other intriguing-looking buttons. Tap the a name of the track to reveal a contextual menu; for more options, tap the '...' icon to the right of the track name.



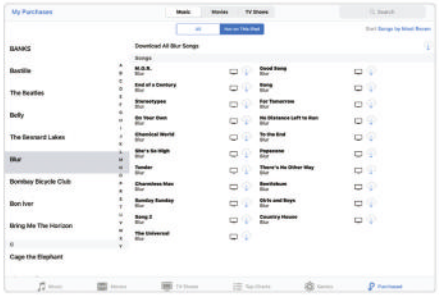
7 See more details

You'll now see a long list of options, all of which enable you to do fun things with the current track. To find out more about a song, tap View Credits. Here you'll be able to see who performed on the song, as well as who wrote it. Cool!



8 Sing along!

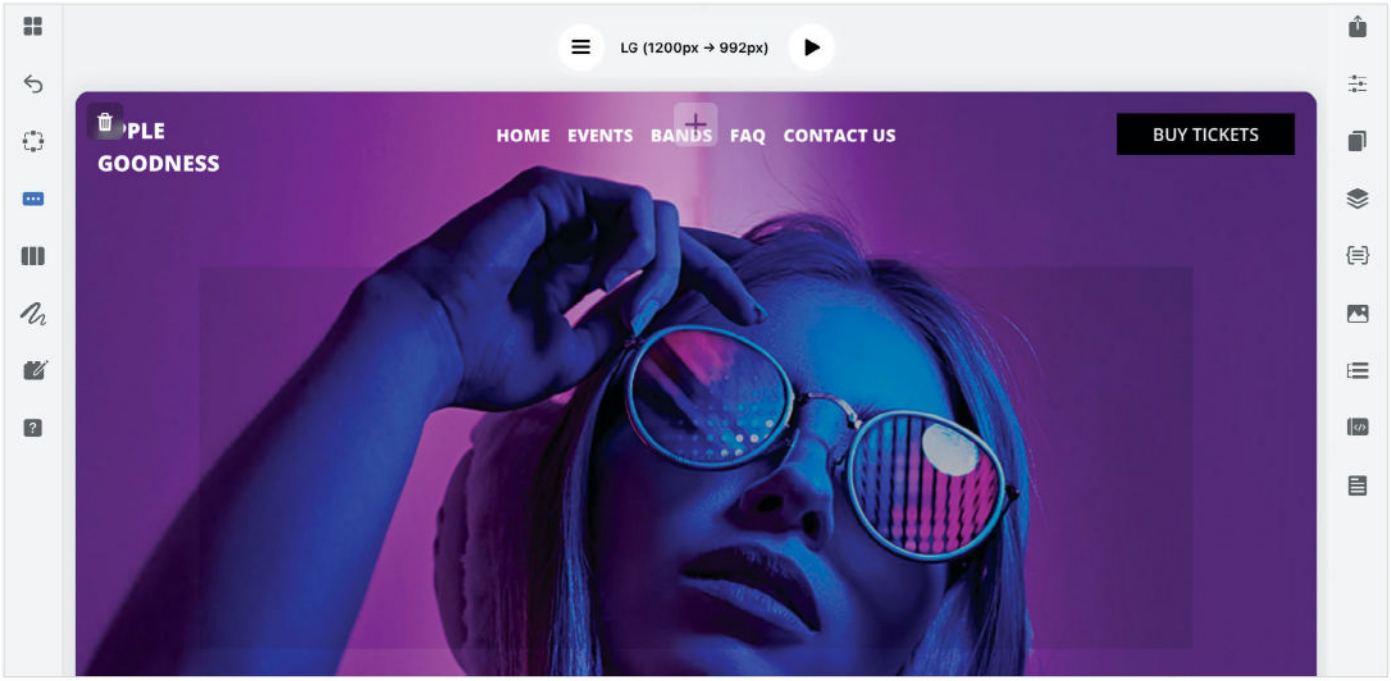
Back in full-screen view, tap the Lyrics icon to see a side-by-side view of the currently playing track, and its lyrics. Tap the microphone icon (top right) to enter Apple Music's karaoke mode, which enables you to sing along with the song.



9 Download purchases

Can't find a song you own in your library? Open the iTunes Store app and tap Purchased (bottom right), then the Music tab to see relevant purchases. Scroll thought the list tap the cloud icon on any track you'd like to download.

Image credits: Apple Inc, Motown Records/UMG Recordings, Inc.



Build your website with Blocs

The power to create responsive websites is at your fingertips with this app

IT WILL TAKE
› 1 hour

YOU WILL LEARN
› How to build a basic website

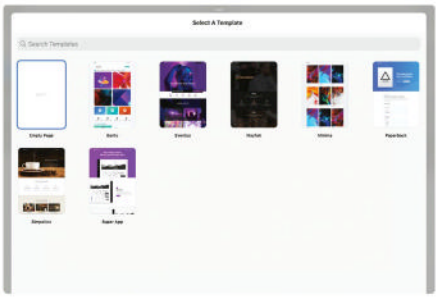
YOU'LL NEED
› Blocs (£3.99/month or £39.99/year), iPadOS 15.6 or later

Blocs has been available on the Mac for a number of years, enabling web designers and developers to quickly create professional-looking websites and WordPress themes without needing to write any code. More recently, it's been launched on the iPad, giving the choice of creating a website from scratch or using a template.

Given the extensive number of features beneath Blocs' simple looking interface, it's difficult to do this app justice. As well as using Bloc sections to structure websites and Bric elements to bring them to life, you can add gradients and shadows, apply CSS filters and add scroll-based parallax effects. Fonts can be imported and the Blocs store contains custom add-ons.

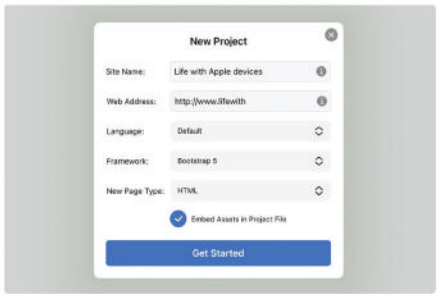
Pages can be saved to iCloud Drive, letting you pick up where you left off on a Mac. They can also be published directly to a server with a few taps. Just be aware there's a small monthly or annual fee if you want to go beyond the free trial. **David Crookes**

HOW TO How to create a site ›



1 Start a new project

Launch Blocs and choose where you want to store your project (iCloud Drive or On My iPad) then tap the '+' icon or Create Document. Next, either begin a project from scratch by clicking Empty Page or use a template.



2 Input key information

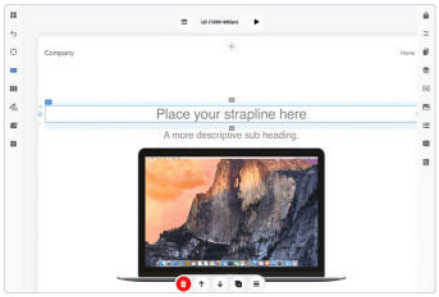
Templates get you off to a flying start; use the wizard to input a name, choose a logo, customise colours and select a font. Starting a new project lends more control; enter the site name, web address and page type.

3 Begin building

When you begin a fresh project, you will see a blank screen. Tap the '+' icon at the centre and choose a section for your site, scrolling down to see options such as navigation, hero, header, feature, forms and gallery.

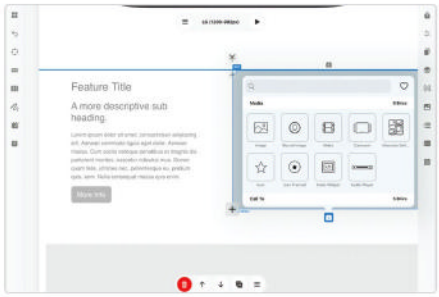
› Image credits: Apple Inc, Cazoobi Ltd

CONTINUED... How to create a site >



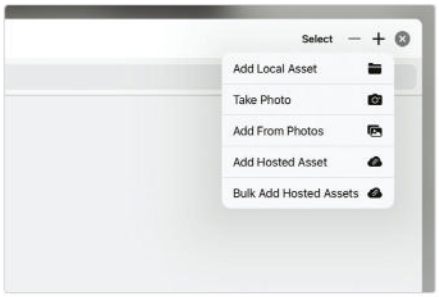
4 Change the elements

You can select any elements in a section (or on a template). Try tapping text to adjust the width and placement of the words, using the left-hand icons to adjust the font size or double tapping to write a replacement.



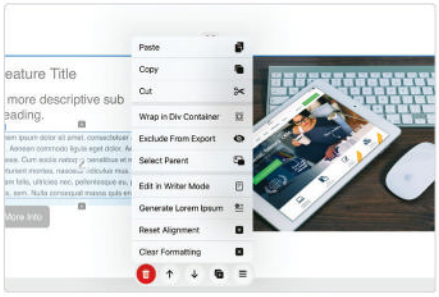
5 Add more sections

Tap the '+' icons to add Bloc sections. We've added a feature column with space for an image. By tapping to highlight the image box, you can select the '+' bric icon and choose a different type of element such as a video.



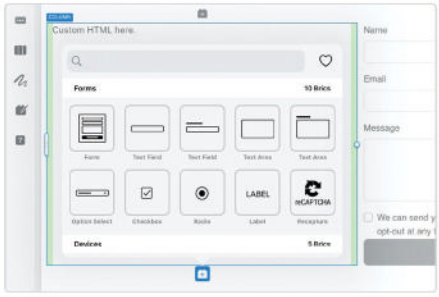
6 Include an asset

To insert content into these sections, you need to add them to Blocs. Tap the image placeholder, for example, and, when the assets screen appears, tap '+'. Choose an existing photo or take a new image then tap to use it.



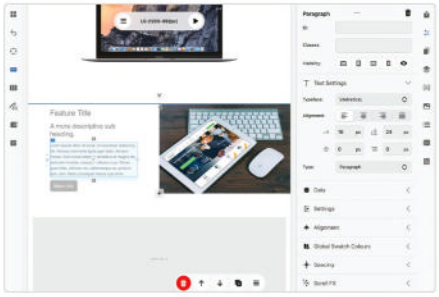
7 Use Quick Edit

Don't worry about making mistakes. Either tap Undo in the left-hand menu or use the floating Quick Edit Tool. It lets you delete or duplicate elements while offering a menu containing options for specific elements.



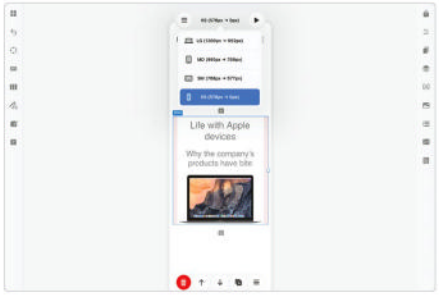
8 Keep going

Continue adding Bloc sections and Bric elements (which include an audio player, icons, code widgets, Tweet buttons, text links, lists, dividers and more) to build your pages. Brics can be tapped, held and dragged.



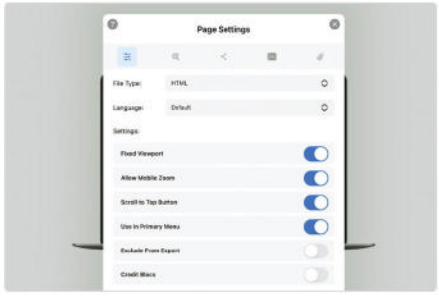
9 Make adjustments

Blocs feels straightforward but there's a surprising amount of depth. Select an element and tap the Inspector icon (right side, second down) to fine-tune text, alter animation, add custom attributes or notes and more.



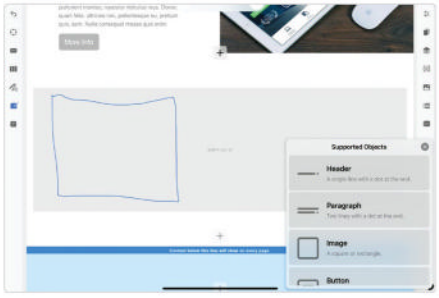
10 Check the sizes

Websites are viewed on different sized screens. Tap the breakpoint selector to see how they'll look on a computer, tablet and phone. Use the Inspector to remove awkward-looking images from specific-sized displays.



11 Alter the settings

The Master menu (to the left of the breakpoint selector) lets you change project and page settings. You can alter the background colour, use a content management system (CMS), add SEO keyboards, include code and more.



12 Use Apple Pencil

For speedy editing of your page, grab an Apple Pencil. Tap the Draw icon (left side, second from bottom) and you can add headers, paragraphs, images and buttons by drawing. Tap the top-left icon to save a project.

Shoot long exposures

Add motion blur and light streaks using Camera or third-party apps on iPhone

IT WILL TAKE
› 15 minutes

YOU WILL LEARN
› To add motion blur; create long exposures

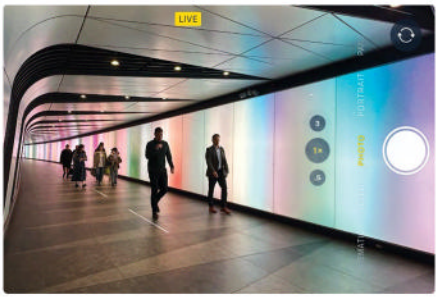
YOU'LL NEED
› Spectre Camera (iOS 15 or later/ Slow Shutter Cam (13.1 or later)

Digital camera users can manually adjust their shutter speed to capture a long exposure. This causes moving objects to become blurred which is a springboard for a variety of creative effects. Ocean waves become abstract paint-like streaks. Cars at night emit laser-like light trails.

Your iPhone chooses its shutter speed automatically to try and capture a sharp, blur-free shot. If you shoot in low light, that might trigger Night mode, where you can manually dial in a longer exposure, up to a maximum of 30 seconds. However, in the daytime you're stuck with the shutter speed that the Camera app chooses.

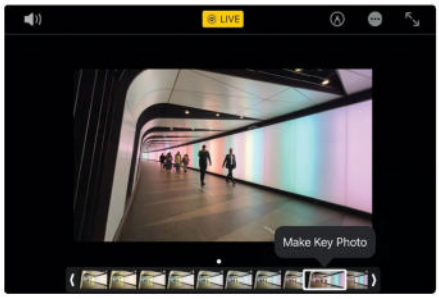
Fortunately, you can mimic the blur caused by a slow-shutter setting using the Camera app's Live Photo mode. And, to give even more control over slow shutter-speed effects, we'll also show you how to use third-party apps Spectre Camera (Free, offers IAPs) and Slow Shutter Cam (£1.99), to add creative blur effects both day and night. **George Cairns**

HOW TO Use Live Photo to add motion blur ›



1 Take a Live Photo

In your iPhone's Camera app, tap the circular Live icon at the top to temporarily display a yellow Live label. Tap the Capture button. This will record a Live Photo which is actually a video with a three-second duration.



2 View Live Photo

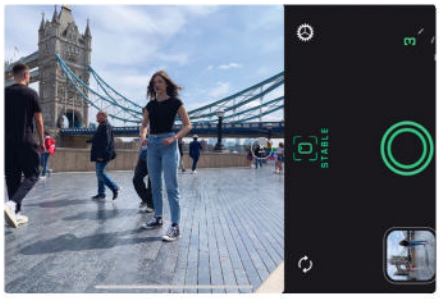
Go to the Photos app to view your Live Photo. Tap Edit. Tap the circular Live icon. Drag your finger in the filmstrip to choose an interesting thumbnail. Tap Make Key Thumbnail. Tap done to display the selected frame.

3 Long Exposure

Tap the Live icon at the top left of the photo. This gives you a list of options such as Loop, Bounce and Long Exposure. Tap Long Exposure. This combines multiple frames to create motion blur from moving subjects.

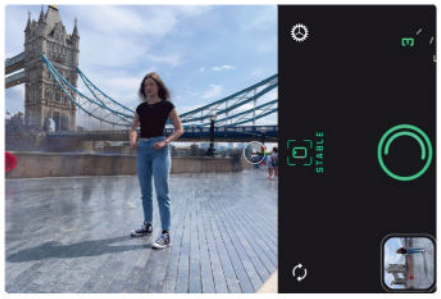
› Image credits: Apple Inc , Lux Optics Inc, Cogitap Software

HOW TO Use Spectre Camera to add motion blur



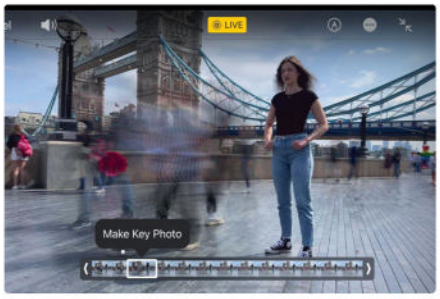
1 Set exposure duration

In Spectre Camera, tap to choose a lens such as 1x. Dial in an exposure time of up to 30 seconds. Here we've gone for three seconds. We've told our main subject to stand still while people walk past her during the take.



2 Take a shot

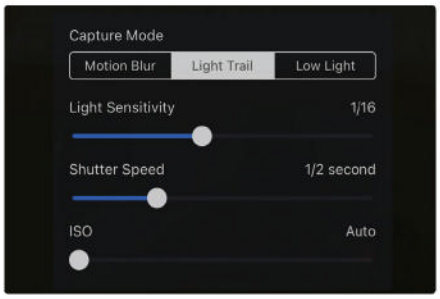
Tap to snap a long exposure. The Stable icon helps keep static subjects looking sharp while blurring moving ones. Hold the iPhone as steady as you can during the exposure. Spectre saves a Live Photo to the Photos app.



3 Fine-tune blur strength

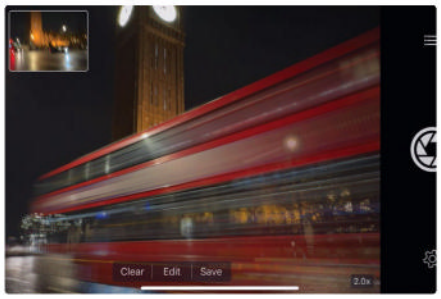
Go to the Photos app. The moving people in Spectre's Live Photo look too blurred. Tap Edit. Tap the Live Photo icon at the right. Swipe to an earlier thumbnail where the motion blur is less strong. Tap Make Key Photo.

HOW TO Create motion blur in Slow Shutter Cam



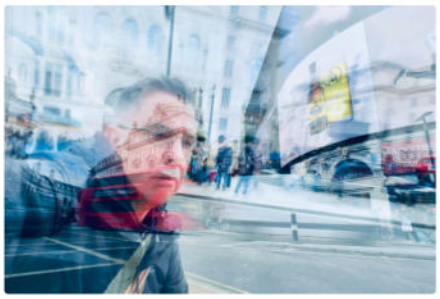
1 Adjust settings

Using Slow Shutter Cam, you can tap the gear-shaped settings icon and choose a mode such as Light Trail. Use sliders to choose Light Sensitivity and Shutter Speed. Tap the shutter button to capture a long exposure.



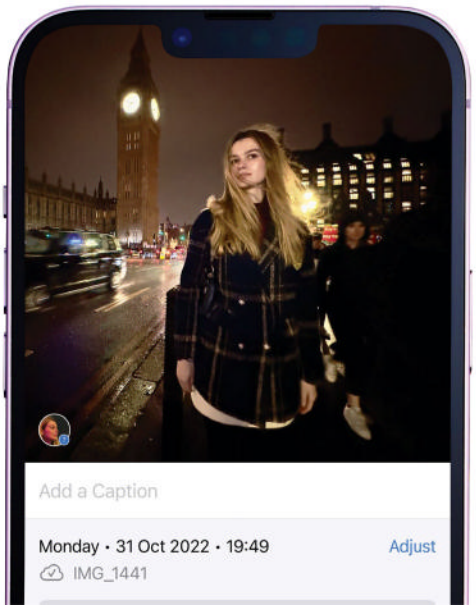
2 Snap a shot

Tap to take a long exposure shot. The motion blur produced by Slow Shutter Cam is superior to the iPhone's Night Mode and the Live Photo long-exposure technique because it's easier to fine-tune the blur amount.



3 Layers

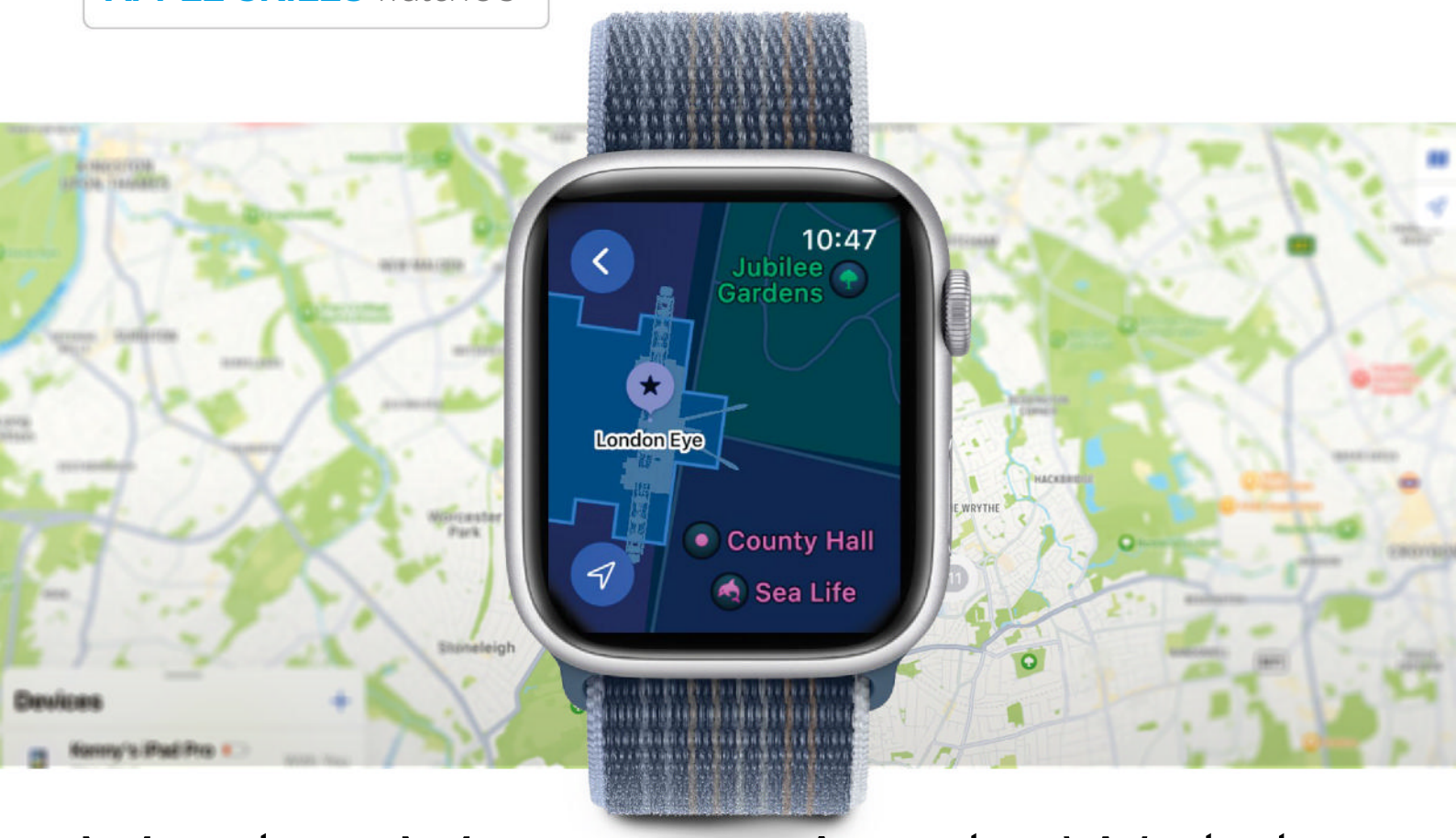
Slow Shutter leaves each long exposure on screen. You have to clear the image to take a new one. Alternatively, you can snap multiple shots without clearing them to build up an abstract montage of blurred subjects.



Need for speed

Find out more about a shot's shutter speed

Capturing an effective long exposure shot can be a hit and miss affair, whether you're using a long Night mode exposure in the native Camera app or dialling in a slow shutter speed in a third-party app. Even shots taken with the native Camera app will have varying shutter speeds depending on the scene's lighting. By tapping the 'i' (Info) icon, you can see what precise shutter speed the iPhone decided to use in every shot. In this example, the shutter speed of 1/29 sec is slow enough to add blur to the car while fast enough to keep the static girl looking sharp.



Master Maps on Apple Watch

The Maps makeover on watchOS makes it even better for getting around

IT WILL TAKE
› 5 minutes

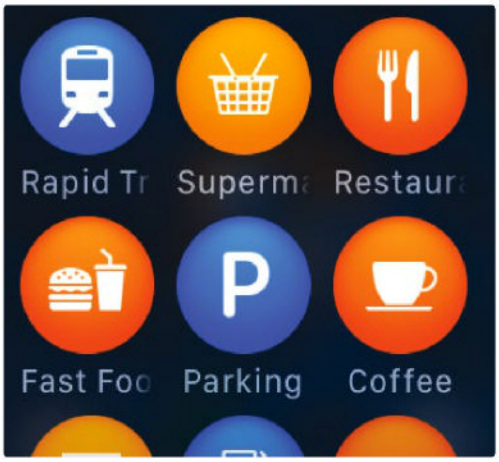
YOU WILL LEARN
› How to find places, get directions and explore using Maps

YOU'LL NEED
› watchOS 9 or later

Genius tip!

› If you're in one of the cities where Maps on iPhone offers directions specifically for cyclists, you can get them on your Apple Watch too.

Maps has been one of the stars on Apple Watch since the very first version, and hopefully we've now all got a bit more used to getting vibrations when driving. Apple has given it a visual makeover for watchOS 10 (we're using the public beta in our screenshots), but the core app works just as it always did; you can get real-time directions, select from a range of transport including walking and public transport, and find nearby places ranging from restaurants and coffee shops to parking and petrol stations.



You'll see a little grid icon in the Search box; tap it to bring up this list of points of interest you can search for nearby.

Integration ease

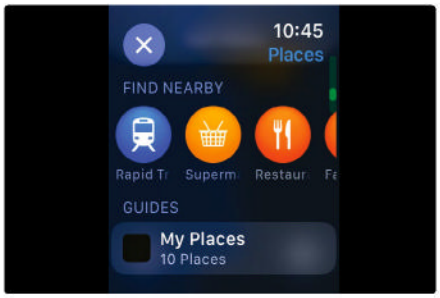
One of the best things about the Maps app on watchOS is that it integrates tightly with the same app on Mac, iPhone and iPad, so it remembers trips you've planned on those devices and enables you to quickly access them from your watch. And if you're a driver, you'll love the way it remembers where you parked your car if you connect to its in-car entertainment via CarPlay or Bluetooth.

In addition to the visual improvements, you'll see in our screenshots that watchOS 10 also brings some significant feature upgrades – although initially most of the new features will be for US customers, such as the new topographic maps with contour lines, elevation and more. iOS 17's new Offline Maps mode will work with Apple Watch, so you'll be able to download maps for areas where you're not sure you'll be able to get a mobile signal.

Carrie Marshall

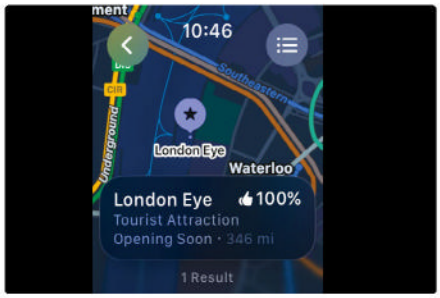
› Image credit: Apple Inc

HOW TO Go anywhere with Apple Watch



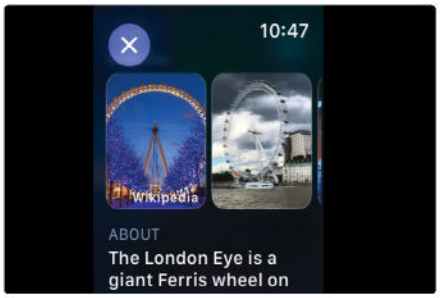
1 Choose your search

In addition to searching, if you scroll down the main Maps page you'll see two more categories; Find Nearby, which helps you find points of interest, and My Places, which is any places you've saved to Maps on any of your devices.



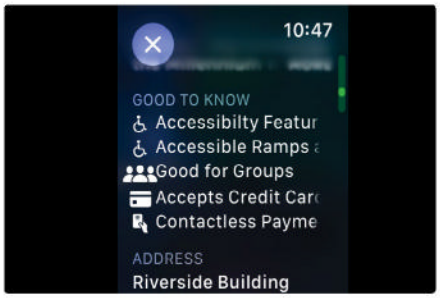
2 Find your destination

Let's use the search option, which you can use with the on-screen keyboard or with your voice. Tell Maps where you want to go and it will come back with likely matches. In most cases, we've found the first result is the one we want.



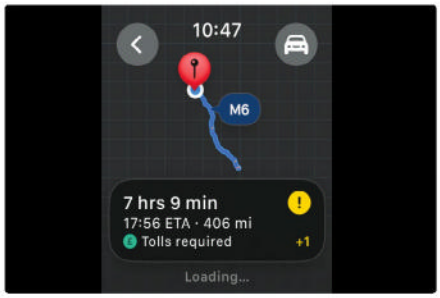
3 Learn about it

Maps doesn't just show you where a place is. It can also tell you about it – so, in the case of tourist attractions, you'll see a description of the attraction as well as photos from Wikipedia. Food places get photos from Yelp.



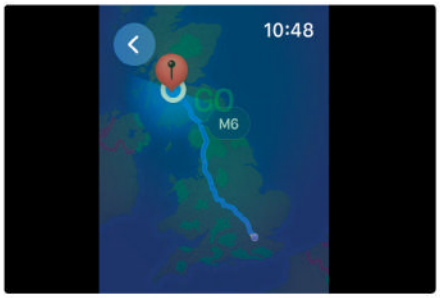
4 Get essential info

Scroll further and you'll get crucial information to let you know whether the venue has accessibility features, whether there are ramps for wheelchair users and even whether you'll be able to use Apple Pay in the gift shop.



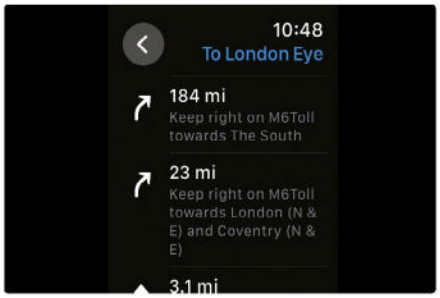
5 See the route

Tapping on your destination will show you the route and any essential warnings. For example, on our trip to the London Eye, the first route involves a toll road and the Low Emission Zone. Turn the Digital Crown for alternative routes.



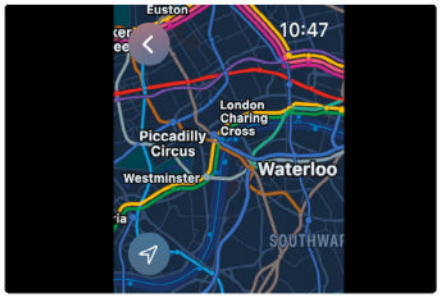
6 Start your engine

Tapping on the route to begin navigation replaces the screen with a big green GO before fading into the map view, as shown here. It's completely unnecessary but adds a nice bit of drama when you're going to the shops.



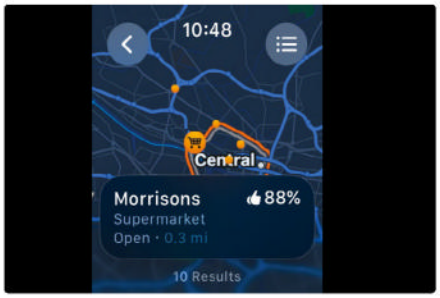
7 Preview the steps

Once you select the route, swiping down the screen changes the view. As you can see here, we've gone for turn-by-turn directions rather than a map view. Swipe back up to return to the map view, and up again for details of your destination.



8 Zoom out for more

If you want to get further away or closer in the map view, turn the Digital Crown; towards you will zoom in on the map, and away from you will zoom out. This image, of London, shows the Underground routes as well as roads.



9 Find some food

Maps is also really useful for local trips, such as finding the nearest open supermarket. When you use the Find Nearby feature, it'll tell you the opening hours of each choice; use the Digital Crown to scroll through the suggestions.

HOW IT WORKS

Apple's Game Porting Toolkit

Apple's new tool for developers could be a game-changer for Mac

YOU WILL LEARN

› How Apple's Game Porting Toolkit helps Windows games run on Mac

Apple's latest M1 and M2 processors provide much better graphics performance

Key fact

› Old Macs that used Intel processors included a piece of Apple software called Boot Camp. This enabled you to install Windows – which was designed for Intel processors – on your Mac, and then switch between the macOS and Windows as required. It was a great option for playing Windows games – but Boot Camp no longer runs on the latest Apple silicon Macs.

Hogwarts Legacy is one of the big-name games that seems to run well using Apple's Game Porting Toolkit.

Whoopi Goldberg caused a bit of a stir online recently, when she criticised games developer Activision-Blizzard for not releasing the critically acclaimed Diablo IV on Mac. But this is nothing new for Mac gamers, and the sad truth is that Macs have never been any good at gaming. What's even worse is that this situation is primarily Apple's own fault. Many Mac models over the years have used underpowered graphics cards that simply weren't powerful enough to handle high-speed 3D graphics and games. And the arrival of Catalina (macOS 10.15) a few years ago caused a kind of gaming apocalypse, killing off dozens of popular Mac games that could no longer run on Catalina, as well as later versions of macOS.

But there are signs of hope for Mac gamers – not least because Apple's latest M1 and M2 processors provide much better graphics performance than previous generations of Macs that used Intel processors. And, to take advantage of that improved performance, Apple recently announced a new Game Porting Toolkit that aims to make life a lot easier for games developers who want to convert – or port – their games for the Mac.

Emulation vs translation

A beta version of the Game Porting Toolkit was publicly available for a few days immediately following Apple's Worldwide Developers Conference (WWDC) in June, but it has now been withdrawn and is only available for people who have officially registered as Mac developers on Apple's Developer website (developer.apple.com). However, we got our hands on the beta as soon as it was available, so we've had some time to get an idea of how it works.

Some people have referred to the Game Porting Toolkit as an 'emulation' tool. That's not entirely correct, though, as emulation programs, such as Parallels Desktop and VMWare Fusion, use software to create a virtual machine (VM) that runs on your Mac and mimics – or 'emulates' – the way that a physical PC works. You can install Windows on the VM, and then install your Windows games and other Windows apps in

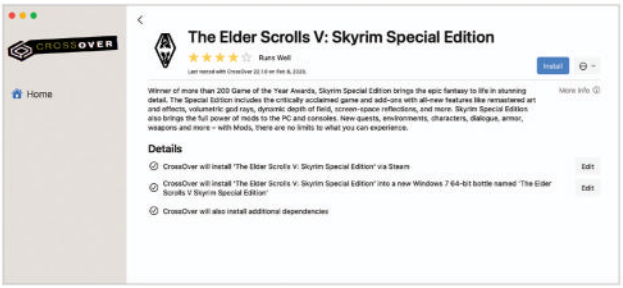
› Image credits: Warner Bros Entertainment Inc/Avalanche Software/ Wizard World & Harry Potter Publishing/JK Rowling/Portkey Games, Apple Inc

Crossing over

Apple's Game Porting Toolkit is actually based on an existing software tool called CrossOver. This was developed by Codeweavers to help Mac fans get their favourite Windows games and apps running on the Mac.

However, CrossOver itself is based on an open-source project called WINE – which stands for 'Wine is not an emulator'. That name emphasises the difference between 'emulation' programs like Parallels Desktop and VMWare Fusion, and the 'translation' features provided by WINE, CrossOver and Apple's own Game Porting Toolkit.

This 'translation' approach also means that you don't need to buy and install a full version of Windows in order to run Windows games on your Mac. And, since your Mac isn't trying to run both the macOS and Windows at the same time, this also means you get better performance for your games. The Apple Game Porting Toolkit is designed for developers, but there's a demo version of CrossOver available to try out (codeweavers.com). Diablo IV – here we come!



A demo version of CrossOver is available to try at codeweavers.com.

order to run them on your Mac. Unfortunately, an emulated virtual machine is nowhere near as fast as an actual physical PC, and emulation isn't really a good option for playing Windows games that need high-speed 3D graphics.

Rosetta for games

In fact, the Game Porting Toolkit is perhaps closer to the Rosetta software Apple provides for Apple silicon M1 and M2 Macs. Rosetta enables old software, originally written for Intel-based Macs, to run on Apple silicon by translating old Intel programming code into 'native' code that runs on the M1 and M2. The Game Porting Toolkit works similarly, but is designed for 3D graphics and audio, as well as for input devices such as a keyboard, mouse, trackpad or gamepad.

Modern games and software can consist of millions of lines of programming code, so translating each individual line of code would slow things down too much. However, modern operating systems use tools known as APIs to simplify many complex tasks. An API – or application programming interface – provides quick access to complex sets of programming instructions, so developers don't have to start from scratch by writing new code for every aspect of their games. Microsoft Windows includes an API called Direct3D that is designed for 3D graphics and games, and which includes a variety of commands for creating graphical effects, such as lighting, shadows or the texture of fabric for a character's costume.

macOS doesn't use Direct3D – which is one reason why porting Windows games on to the Mac involves so much hard work for developers – but it does have its own API for graphics commands called Metal. The Game Porting Toolkit can look at a Windows game and when it sees Direct3D being used to create 3D graphics it can translate the Direct3D commands into the equivalent Metal commands. Other important APIs used in Windows games are Xaudio2 for working with audio, and DirectInput, which enables you to control the game with a keyboard, mouse, or gamepad. The Game Porting Kit is designed to work with all these Windows APIs, automatically translating them into their Mac equivalents, so that developers can see how well their games will run on the Mac.

The Game Porting Kit doesn't work well with all games, but we've heard good reports online from people who have been able to get top Windows games such as Diablo IV and Elden Ring running successfully on Mac. That's great news for Mac gamers, and if a game doesn't run very well, the Game Porting Toolkit can also help developers to identify problem areas and give them an idea of how much time and money they'd need to invest in order to properly adapt their games. **Cliff Joseph**

Death Stranding is one of the first games to come to the Mac using the Game Porting Toolkit.

Key fact

› Apple's M1 and M2 processors include a specialised GPU – graphics processing unit – that handles 3D graphics for games, as well as graphically intensive tasks such as photo or video editing. An affordable Mac, such as the Mac mini includes an M2 processor with 10 GPU cores, while the top-of-the-range M2 Ultra in the new Mac Pro can have up to 76 GPU cores.

› Image credits: Codeweavers Ltd, Kojima Productions/Guerrilla Games

GENIUS TIPS

EDITED BY **HOWARD OAKLEY** >

EXPERT ADVICE

Our resident genius solves your Mac and iOS problems

Contact us

Email your queries and your questions to **genius@macformat.com**

A missing key in virtual macOS

British and US English are so different they require separate keyboards: ISO in the UK, and ANSI in the US. They're easy to distinguish as the ISO version, used in Europe and much of the rest of the world, has different left Shift and Return keys. Count the keys, though, and there's a more 'sinister' difference, as the ISO keyboard has an extra key at the left of the numbers.

Apple supplies ISO keyboards and layouts for many languages, but macOS virtualisation for Apple silicon Macs is an exception as it only supports ANSI. In practice, the difference you'll notice is that missing key: in ISO English layouts, it won't cause a problem, as that provides § and ± symbols. But in French, the ANSI layout loses @ and #, which are commonplace in computing, and make a virtual machine almost unusable.

Blocked email accounts

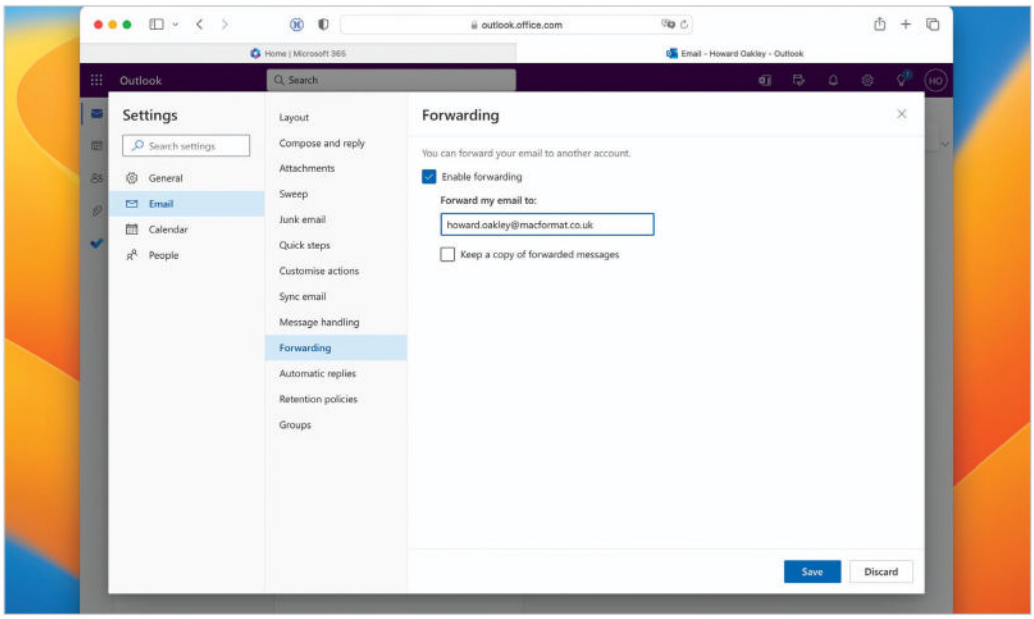
Q My ISP says it's going to block basic authentication, so I can't collect my email using an app on my Mac, but have to use its web interface. How can I keep my local mailboxes?

by OLLIE HAWKSWORTH

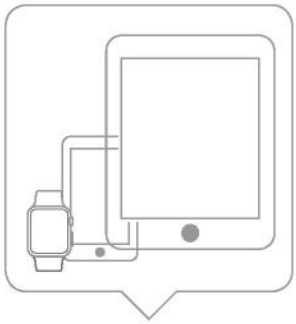
A Some ISPs are telling those with bundled mail facilities that this authentication block is being done by Microsoft to improve mail service security, and there's some truth in that. What's being done is to remove authentication using a username and password.

That has been replaced with modern authentication, typically OAuth2. That requires your mail client to run a one-time setup with the mail server, so it can log in and fetch your mail using either POP or IMAP, and send using SMTP. But those providers aren't enabling that to let Microsoft's own Outlook 365 or clients like Postbox collect their mail securely. Instead, the only services they're supporting are webmail, or Outlook on iOS or iPadOS.

The best workaround is to set up accounts with another mail provider like Gmail, Titan or another, and set your original mailboxes to forward email to that account, from where you collect and read them using your email client. That's easy to configure in Outlook's webmail, although you'll still want to check your original mailbox on the web from time to time.



If your provider only allows web access to email, set it to forward everything to another account from where you can collect it.



iOS software ›

Swipe away your touchscreen troubles and rekindle your love of Apple's mobile devices

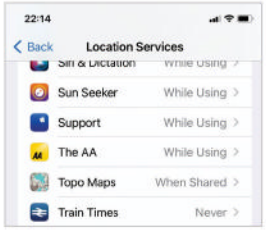
Quick-fire questions ›

Why won't my iPad connect to the App Store?

› Ensure your device has a good Wi-Fi connection. Shut it down, and wait 30 seconds before starting it up again. Then check in Settings › [your name] that it's signed in correctly with your Apple ID. If those are good, check service availability at bit.ly/mac395sysstat.

How to tell which apps track my location?

› Tap Settings › Privacy & Security › Location Services to see a list of all the apps you've allowed to access your location data. To tell which use that the most, those that have accessed location in the last 24 hours are marked with grey arrows; those that have accessed it most recently have purple arrows.



Export your Health data to a spreadsheet

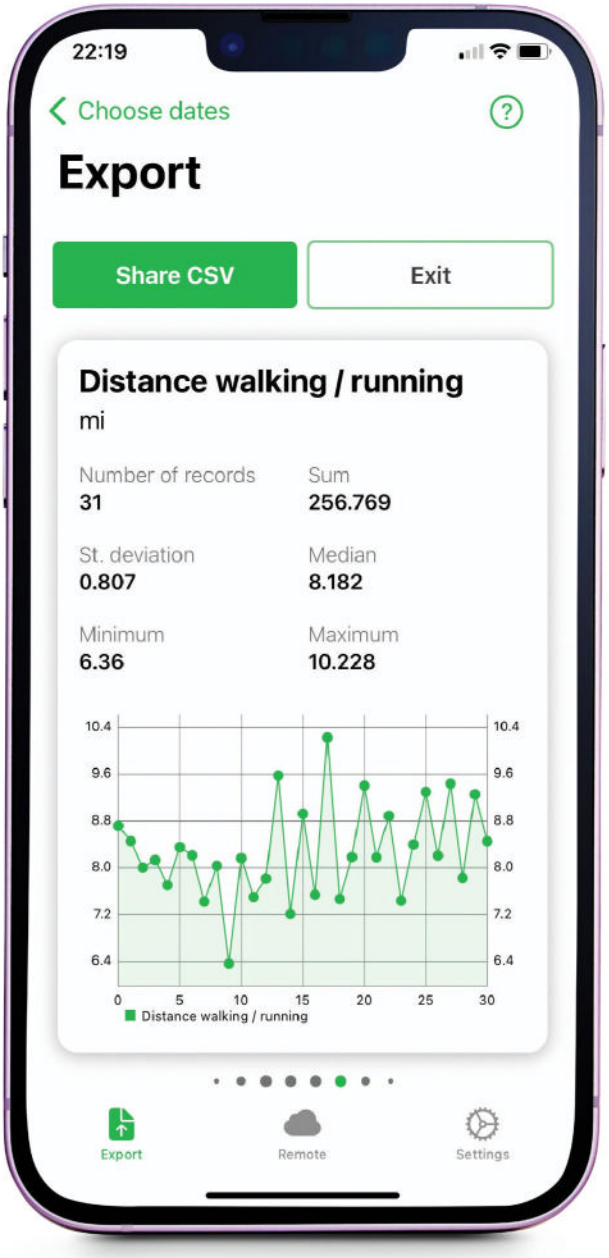
Q How do I go about downloading details of my daily walking distance from the Health app so I can turn the info into charts?

by STEVE WENDEL

A The Health app only provides a way to export all your data in formats unsuitable for spreadsheets. To use that, tap on your user picture at the upper right of the Summary, then on Export All Health Data. The app can take several minutes to prepare those files, and you can then AirDrop them to your Mac or another device, or save them to iCloud Drive. As they contain personal data, you may wish to protect them using encryption. In addition to ECGs and workout routes, there will be two large XML files containing all the data that the Health app uses to create its charts. Finding an app to then do anything useful with those is more of a challenge.

To make your own charts using Numbers or another spreadsheet you need a simpler summary of just the data you want in CSV format, available from Tomáš Pařízek's HealthExport app (healthexport.app). Once you've given permission for that app to access your data, select the data you want it to export; in your case, this is an 'aggregated' type listed as Activity. This can include distances covered by walking, cycling, exercise time, and more.

Then tap on the Export aggregated data button and select the date range and period such as days. The app provides graphical previews of the data being exported, and you can send or save the CSV file as you need, so you can open it in Numbers or Excel.



Preview your Health data before HealthExport shares it in CSV format, to import into your favourite spreadsheet.

› Image credit: Apple Inc

Peripherals

Thinking inside the box to refresh the parts other tips can't reach

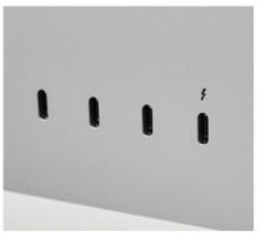
Quick-fire questions

Which printers are supported by macOS Ventura?

Macs can print to all those with full AirPrint support. Apple maintains a list at bit.ly/mac395airprint including a dozen AirPrint-enabled print servers, and some that connect via USB only, so can be used by Macs but not from devices.

Can I connect a USB-C hub to my Studio Display?

Yes, but you may prefer not. It has three USB-C ports supporting up to 10Gbps, and three snags: these don't support faster USB 3.2 Gen 2x2 speeds, and all are fed through one Thunderbolt 3 connection with your Mac. They're active all the time the display is plugged in, but power down briefly whenever the connected Mac shuts down.



Connect an enterprise U.2 SSD

Q Can I connect a U.2 SSD and use it with my Mac?

by ERIC LAMBERT

A Many U.2 and U.3 SSDs are coming onto markets like eBay at present because enterprise users, who have relied on them in their servers, are getting rid of them as they're end of life and need replacement. Models like Samsung's PM1733 originally cost well over £1,000 for 15TB storage and speeds of over 7GB/sec. They present challenges connecting them to Macs.

Some may have had hard working lives. Although Samsung claimed that they 'never die', they do still age, and those in heavily-loaded servers may be nearing their end of life. If you can, read its SMART indicators before spending any more money on it.

If you happen to have a 2019 or later Mac Pro, you can buy an add-in PCIe card for it with U.2 support. For all other Macs with Thunderbolt 3 ports you'll need a special enclosure with a suitable power supply and active cooling, otherwise they'll get exceedingly hot, suffer thermal shutdown and stop working. An OWC Mercury Pro U.2 Dual enclosure at around £336 is ideal, and accommodates a single U.2 SSD in each of its two bays. You can also populate an OWC U2 Shuttle carrier with up to four M.2 SSDs, and use that instead.

It's also possible to put together a string of adaptors to make the connection, including a U.2 to M.2 adaptor, an M.2 enclosure, and a supplementary 15-pin SATA power adaptor, but in this instance you'll then need to provide your own cooling fan.

Enterprise SSDs in U.2 and U.3 formats require the right connections and power supply, and good active cooling or they won't work.

Email your queries and your questions to **genius@macformat.com**

Try resolving problems with external displays and Intel Macs by disconnecting them and resetting the SMC and NVRAM.

External displays stuck in standby

Q After updating Ventura, my Intel iMac's two external displays refuse to come out of standby mode. How can I fix them?

by PHIL THOMPSON

A Problems connecting to displays aren't easy to resolve as they should just work automatically, and there are precious few controls.

First shut your Mac and both displays down, and disconnect their cables from the ports on your Mac. Then start your Mac up and reset its NVRAM and SMC according to the instructions detailed at bit.ly/mac395smcreset. Once your Mac is up and running again, power up and connect the first external display. Hopefully that will appear in System Settings › Displays, where you can set it up. After that, repeat the process with the second display.

If that doesn't work, consider changing the cables connecting the displays to your Mac for better quality branded ones, or changing any settings offered by the displays, if that's possible. If you still can't get any joy with them, contact Apple Support, who may be able to escalate this to someone who can do something about it for you.

How to defragment an APFS external hard drive?

› The APFS file system has its own support for defragmentation, and no third-party utility is available. This doesn't help fragmentation of the file system metadata itself, though, which is thought to be largely responsible for slowing access to hard drives.

Can I use a Touch ID keyboard with my Intel Mac?

› No, as they're only supported by the Secure Enclave Processor in Apple silicon Macs. Intel notebooks with T2 chips have built-in support for Touch ID on their internal keyboards, but even they can't support it in an external keyboard.

Self-disconnecting SSDs

Q Why do some USB 3.2 SSDs connected through a Thunderbolt 3 dock suddenly disconnect themselves from my Mac?

by MARC BROWNE

A There are two main issues to focus on: cables and sleep. To connect to Thunderbolt 3 ports, cables should have a positive click to lock them home at both ends, which some USB-C cables don't have. The sockets on some external drives don't provide this either, and don't give confidence in their connection. Careful selection of a Thunderbolt 3 or 4 cable should provide a more positive feel and ensure that they don't drift. It can be worth trying several different cables until both connections are secure and you're confident of them.

Sleep is a little more tricky to deal with, and it's worth observing carefully whether this disconnection occurs when your Mac goes to sleep or wakes up. If there is an association, use Ohanaware's unique SleepAid from ohanaware.com to fully investigate what's going wrong to cause this.

Some SATA enclosures need firmware updates for them to become reliable with recent versions of macOS, so it's worth checking with the individual manufacturer's support site to see if that might be required.

If you still can't avoid these sudden disconnections, it could well be that the SSD is faulty. If it's still within its warranty period, contact the manufacturer to make a warranty claim for its replacement.

If an external SSD keeps disconnecting from a dock, ensure its cables click home securely and don't come adrift.

› Image credit: Apple Inc, Other World Computing Inc

macOS ›

Shine a spotlight on the solutions to your most irritating Mac problems

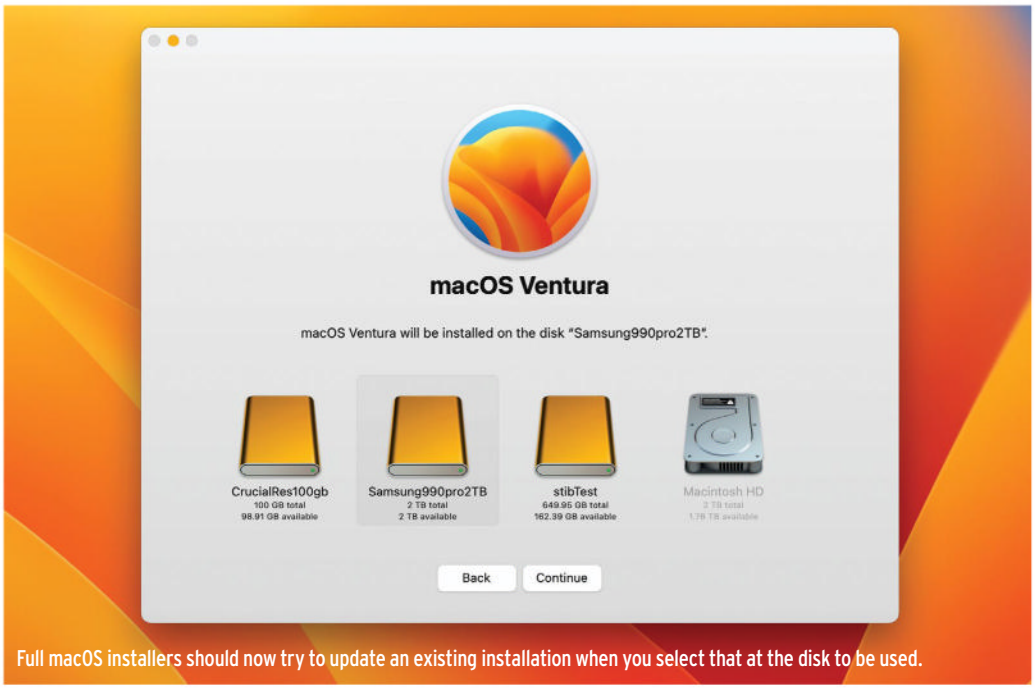
Quick-fire questions ›

How to stop apps saving old versions of documents?

› There's no control to do this, although some apps might offer it in their Settings. One workaround that may work is to delete the hidden folder named .DocumentRevisions-V100 on the volume storing your documents, and replace it with a locked file of the same name. This could cause other problems, though.

Why can't Spotlight find any apps on my Mac?

› It's likely that you've inadvertently disabled that from its results. Open System Settings and select Siri & Spotlight. In the Search results section, tick Applications. As Spotlight should still have been indexing your apps even though it wouldn't return any results, that shouldn't require any re-indexing before it works fully.



Full macOS installers should now try to update an existing installation when you select that at the disk to be used.

macOS updates have changed

Q How to obtain a 'Combo' updater for Ventura 13.5?

by RACHEL VALENTINE

A Since Big Sur, macOS installers and updaters have been quite different from those of the past. Instead of just copying across system files to a volume on your startup disk, they now have more work to do to create the snapshot that forms the bootable system, to firmlink parts of that to its paired Data volume, and to secure the whole system using hashes to verify its integrity.

From Big Sur onwards, Apple has provided only two ways to update macOS: online updates, delivered through Software Update or its command-line equivalent, softwareupdate, or using a full installer app. Updates completed online automatically cater for different starting versions, so they can take any previous version of macOS 13 straight to the latest version, but that's the only destination available. You don't get any choice or flexibility.

Combo updaters of the past sometimes fixed problems with broken updates. That's no longer necessary, as the hash system used to verify the integrity of the system ensures that it's perfect down to the very last byte.

What you can do instead is install the macOS version of your choice. Those available can be listed in Terminal using the command

`softwareupdate --list-full-installers`

and you could download the full 13.5 installer using

`sudo softwareupdate --fetch-full-installer --full-installer-version 13.5`

then entering your password. You'll then get an installer package containing the full installer app for macOS Ventura 13.5. Apple guarantees the result is identical to updating from any previous version of Ventura.

› Email your queries and your questions to **genius@macformat.com**

Keep two versions of macOS

Q How to keep Ventura available on my M2 MacBook Pro when I upgrade it to Sonoma?

by GUY JACKSON

A The best solution depends on what you still want to be able to do in Ventura. If you want to run App Store apps, access iCloud or do anything else dependent on your Apple ID, then the only way to keep access to an older version of macOS is to install it on your Mac's internal or an external drive. If you don't need those, then it's quicker and simpler to run Ventura in a virtual machine (VM).

Dual-booting between different macOS can prove fiddly to set up, and some find it unreliable. While you could install both on your Mac's internal SSD, if anything goes wrong it could put your primary Sonoma system at risk. Running Ventura from a bootable external SSD is safer, but requires assignment of 'ownership' to that disk for it to become bootable. That's detailed at bit.ly/mac395venturaboot.

If you can live with the limits imposed in a VM situation, you could use Parallels Desktop, UTM or my own free Viable from bit.ly/mac395viable. Performance is near-native, you don't have to restart into Ventura to use it, and it's really convenient.

How do I reset a firmware password?

› The only way to remove or change a firmware password is in Recovery, and requires you to enter the firmware password. If you can't do that, take your Mac with proof of ownership to an Apple Store and get them to remove the password for you.

How to copy Time Machine backups to a new drive?

› If your backups are made to APFS, you can't copy or move its backups from that storage because they're snapshots that can't be copied to a different volume. You can still copy backups from older HFS+ volumes.

Customise your apps

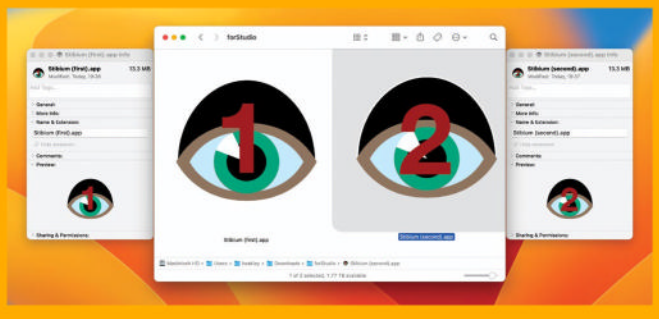
Q How much can I customise an app in Ventura without breaking it?

by DAN MCDONALD

A In the case of third-party apps you've installed, it's perfectly safe to change their icon and name, but little else. Look inside an app and you'll see it's a 'bundle' consisting of a single folder named Contents. You should avoid tampering with anything inside that, as that would risk breaking the app's signature, so rendering it unusable: every time you'd try to open it, macOS would crash it deliberately because the hash fingerprints of its code files no longer matched those baked into its signing certificate.

Giving it a different icon can be performed safely by pasting a replacement image into the existing place at the top left of the Finder's Get Info dialog, which saves that icon into a hidden file named 'Icon?' outside its Contents folder. You can also change its name in the Name & Extension section below, but don't try changing its extension as that too will cause problems. You can of course lock it and add tags and comments as you wish.

Apps bundled by Apple within macOS are different, as they're baked into the system and can neither be changed nor copied elsewhere. The latter is the result of launch constraints introduced in Ventura, which mean that the only place that a bundled app can be run from is where it is in the macOS System volume.



Customising app icons and names can have practical value should you need to run two copies at the same time.

› Image credit: Apple Inc

BROADCAST YOURSELF!

Calling all influencers! With some hardware, some software and a little know-how, you can be a superstar on YouTube too

Written by Carrie Marshall **Artwork** Grace Morris

The artist Andy Warhol famously said that one day everybody would be famous for 15 minutes. He got the number right and the unit wrong: today, everybody can be famous for 15 seconds. That's how long a song on TikTok lasts – although the video it contains can be a little longer.

There's been an explosion of people uploading music, video and podcasts for people to stream live or listen to at their leisure, an explosion in places to share content, and a whole new world of hardware and software to help make the most of it. It's never been easier to share on social media – although making money from it is more difficult. But money isn't the only reason to broadcast yourself. It's a lot of fun, and you never know where your clips might take you.

Over the next few pages we'll discover the hardware, software and hosts you need to get the most out of sharing. We'll look at the gadgets and apps that do all the difficult stuff for you, explore how to edit your video to make it pop, and show you how to look good on camera. Although we'll mainly be talking about the Mac here, lots of the kit, apps and advice apply to iPad and iPhone too.

STREAM DECK

WHAT YOU WILL NEED

The hardware and software you need to save and stream

First things first, in order to turn your bright ideas into something others can see or stream, you're going to need a few items of both hardware and software.

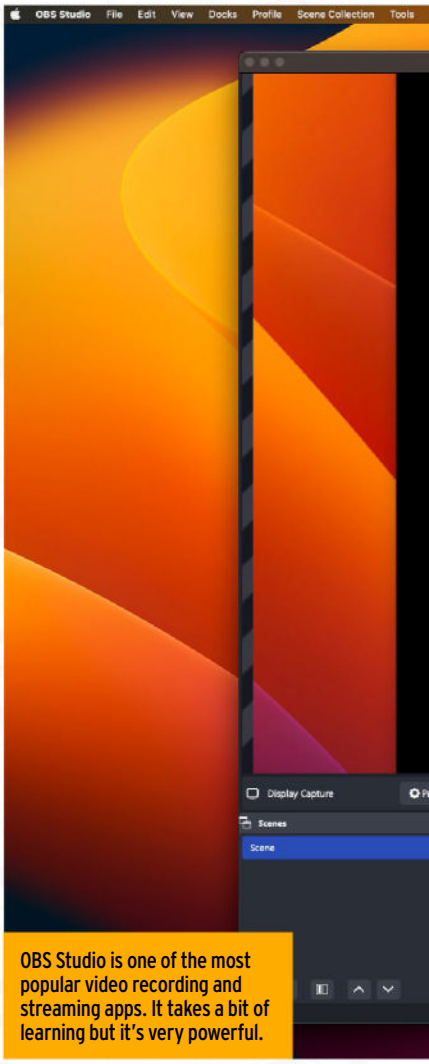
The hardware you need depends on the content you plan to make and where you're going to put it. For example, you can make videos for TikTok or Instagram reels with just an iPhone and Apple's free Clips app, and you can also get iMovie for free in order to access more professional tools, such as effects and editing. You can record a podcast directly into GarageBand and use its built-in effects to make it sound great, and if you want to record people over Zoom or FaceTime there's our old favourite Audio Hijack, which can record pretty much any audio that plays on your Mac.

The most important part of your setup is the hardware that records your sound or your video. For podcasting or voiceovers that means a good quality USB microphone to plug directly into your Mac (or your iPhone or iPad via USB-C or Apple's USB to Lightning converter) or a non-USB microphone connected via a USB audio interface such as a Focusrite Scarlett Solo, M-Audio M-Track Solo or a Komplete Audio box.

For video, if you have a reasonably recent iPhone then its camera is better than many budget cameras and almost all webcams, and if you have macOS Ventura and iOS 16 or later you can use Continuity Camera to make your iPhone work as a webcam for any video app.

If you're a fan of gaming streamers or other video

If you're recording podcasts, Audio Hijack makes it easy to bring in Zoom or FaceTime guests, record multiple mics or capture any Mac audio.



OBS Studio is one of the most popular video recording and streaming apps. It takes a bit of learning but it's very powerful.

Must-have hardware

You don't need to spend a fortune on studio-quality equipment, but there are some upgrades that will make a huge difference. A good-quality mic, a warm white light, or a decent video camera will seriously improve the quality of your content.

Blue Snowball Ice

› £55 › logitech.com

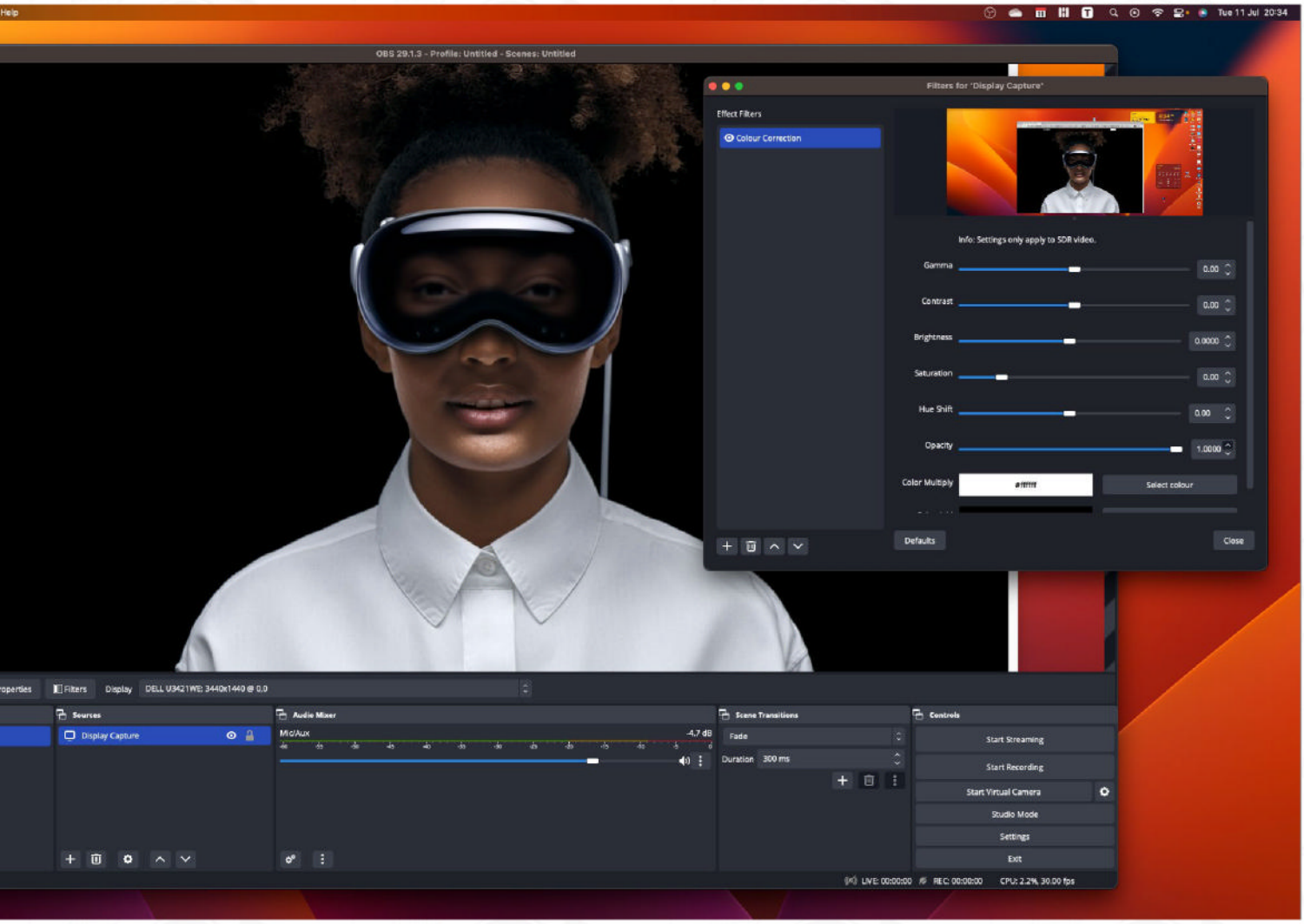
› **A USB microphone can plug directly into your Mac or a recent iPad and, with the right adaptor, you can use it on Lightning iPads and iPhones too.** Designed for podcasting and streaming, this desktop mic is a huge audio upgrade over the built-in mics on your Mac.

Stream Deck Mk2

› £159.99 › elgato.com

› **Turn your Mac into a radio or TV studio with this brilliant little add-on.** You can program its 15 LCD keys to play jingles and stings, control your lighting, play back recorded audio and pretty much anything else media-related you can think of. No wonder video influencers love it so.

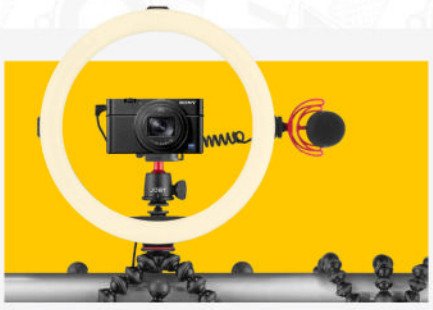
› Image credits: Logitech, Elgato



streamers, you might have seen the Legato Stream deck on the streamer's desktop. That's an interface designed specifically for live streaming, and it features 15 programmable LCD keys you can use to control your video app, trigger audio effects, adjust your audio, control smart lights and more, and there are over 100 plug-ins for specific streaming platforms and hardware.

For recorded audio and video you can simply export your completed content and upload it. But for live streaming you'll need an app. There are lots to choose from, and one of the most popular is OBS Studio. That's free and open source, and if you're willing to take some time to find your way around it's enormously powerful and customisable.

You don't need OBS Studio to live stream; if you have a YouTube account, you can tap on the Go Live button (although when you first go to use it, you'll have to wait 24 hours for authorisation), and Twitch has the Twitch Studio Beta app. But the benefit of learning OBS Studio is that if you change where you stream you don't need to learn a whole new app to do it.



Joby Beamo Ring Light

› £24.95 › joby.com

› **Ring lights with adjustable colour temperatures are the little secret of pretty much every big-time social media streamer; put it in front of your phone and it'll bathe you with flattering light.** It's handy for work video calls and taking selfie photographs too.

Sony ZV-1 II

› £870 › sony.co.uk

› **It's not cheap, but Sony's ZV-1 II photo and video camera has been specially designed for vloggers and podcasters and will make you look and sound spectacular, thanks to its wide-angle lens and triple mic array.** The ZV-1 is still available, often for less than the £649.

Komplete Audio 1

› £89 › native-instruments.com

› **The Komplete Audio 1 is a simple but great-sounding single-input audio interface for microphones and other audio sources and it comes with a good software bundle.** We've used its big brother for years and it's never let us down.

› Image credits: Videndum Media Solutions Spa, Sony Europe BV, Native Instruments GmbH

SCRIPT, CREATE, EDIT

Make sure you get your message across when talking to the camera

Talking into a mic is a craft; the more you do it, the better you get. But that doesn't mean you can't cheat.

If you don't feel confident enough to ad lib, it's a good idea to spend a bit of time scripting what you're going to say. How you do this very much depends on what kind of person you are. Some people prefer to tightly script everything and rehearse. If that's the case, you can use your iPhone stopwatch to get the timings right; writing apps such as our old favourite Ulysses can give you a good estimate of reading time too. Pages' Presenter Mode can turn your iPhone or iPad into a kind of autocue, or you could do the low-tech comedian's trick of scribbling keywords on your hand.

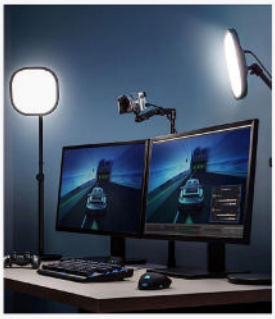
You'll probably find that the sweet spot for you is to script it a little bit but not so much that you're simply reading. And you'll find that the more you do it, the more relaxed and able to go off-script you'll become.

Of course, you can't script everything – so if you're talking over a gaming stream or in a multiple-guest podcast there's no space for scripting. In these instances, write down key questions you want to ask or key points you want to get across.

Get the light right

Don't film yourself with the sun or another very bright light source right behind you; that turns you into a silhouette. And don't do the reverse either, because you're more likely to squint. Not only that, but overly bright light will make any imperfections more apparent.

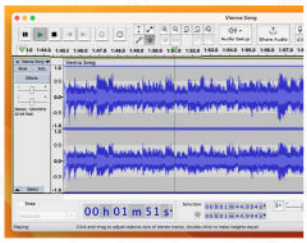
Just like filmmakers do, many vloggers and streamers use artificial lights even in daytime. They're typically positioned in front of and slightly to the side of the camera, or they're ring lights that are circle around the camera – a popular choice for TikTokers and Instagrammers filming on iPhones. Your light should be warm toned – yellowish, not blue.



Professional streamers use one or more LED light to make them look better on camera.

The 5 best editing apps

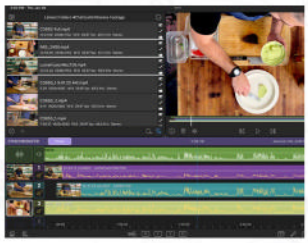
› **You don't need to go Pro with Apple's most expensive apps.** Whether you want to take the umms and aahs out of your audio, resize and resample your video or produce a Hollywood-worthy production, these free or very affordable apps will help you organise your audio and make your videos even more vivid.



Audacity

› Free › audacityteam.org

› **Audacity is a wonderful, free audio editor.** The software makes quick work of fixing recording problems, removing background noise and generally making you sound fantastic. And as it's a multi-track recorder you can use it to record your audio too.



LumaFusion

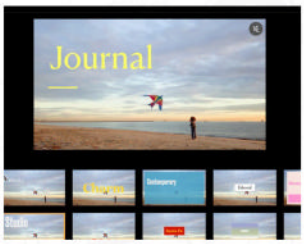
› £29.99 › luma-touch.com

› **Prefer to edit your video from the sofa or do it when you're out and about?** If so, LumaFusion is one of the best heavyweight mobile video editors around. It makes full use of an iPad touchscreen and, if you have an M-series Mac, it'll run on Mac too.

Premiere Rush

› £8.99/month › adobe.com

› **This streamer-friendly sibling of Adobe's famous video-editing app is exceptionally easy to use.** The app is designed specifically for online sharing, and there's a free starter edition to give the app a try without having to subscribe to the full version.



iMovie

› Free › apple.com/uk

› **Apple's free movie making software hasn't had a massive update for a while.** The most recent release was last Autumn, but if it ain't broke, why fix it? iMovie remains an easy and effective way to edit video on Mac, on iPhone and on iPad too.

OpenShot

› Free › openshot.org

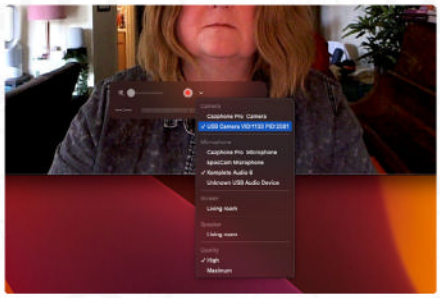
› **This free and open-source video editor is like an even friendlier iMovie.** It's cross-platform, so you can use it on PCs as well as Mac – handy if you're in a mixed computer environment. It's not as polished as some apps but it's great for beginners.

› Image credit: Audacity, Luma Touch LLC, Elgato, Adobe, Apple Inc, OpenShot Studios LLC

HOW TO Edit video easily ›

1 Open QuickTime

For simple recording, you can use a webcam on your Mac: just open QuickTime Player and choose New Audio Recording, New Screen Recording or New Movie Recording. Let's go for the Movie Recording option.

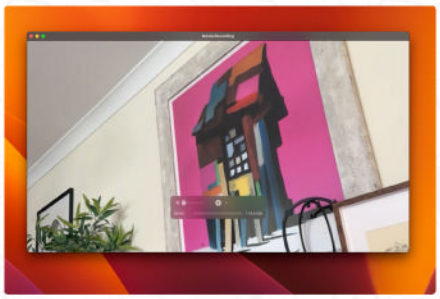


2 Change the camera

If you have an iPhone, its camera is probably better than the FaceTime camera on your MacBook or any external USB camera. Click the drop-down next to the red Record button and you can select your iPhone under Camera.

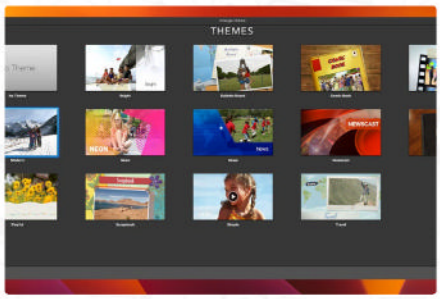
3 See the results

Switching to your iPhone should happen immediately, and you'll now see the live feed from your iPhone's main camera. The next step is to position it: you can buy iPhone mounts that sit on your monitor or prop it up on your desk.



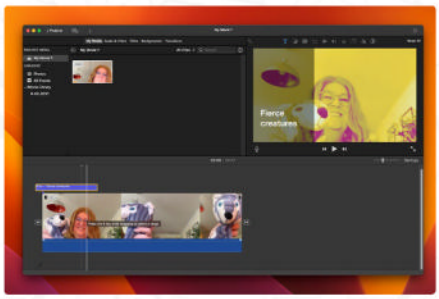
4 Click the red button

Clicking on the red Record button starts recording; clicking it again stops recording. To the left of the control panel you'll see the elapsed time, and to the right you can see how much SSD or disk space you're using so far.



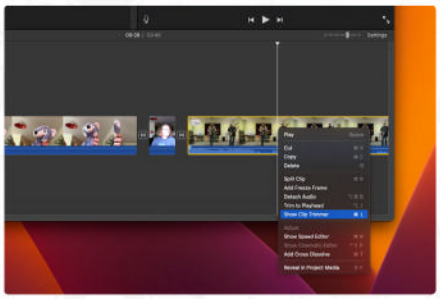
5 Open iMovie

When you're finished recording you can save it or export it in a particular resolution. The next step is to open iMovie, create a new project and pick a theme. This is a design for on-screen elements such as titles.



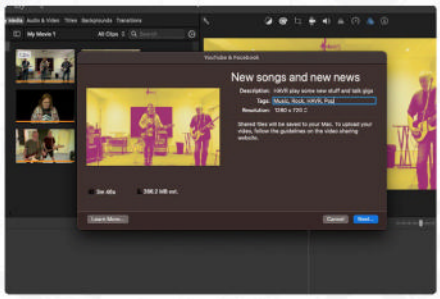
6 Add your clip(s)

You can import your video file(s) either by dragging and dropping them from your Desktop or the Finder, or by using the Import Media button. You can then drag individual clips to the timeline to arrange them.



7 Combine your clips

One of the simplest ways to combine multiple clips is to drag them on to the timeline area one after another. You can then adjust clip lengths, apply transitions between clips and add any visual effects you might like.



8 Export for YouTube

In addition to the usual export options, iMovie has a Share › YouTube & Facebook option. This enables you to output video in a social-media friendly format, and makes sure you tag it by getting you to fill in this screen first.

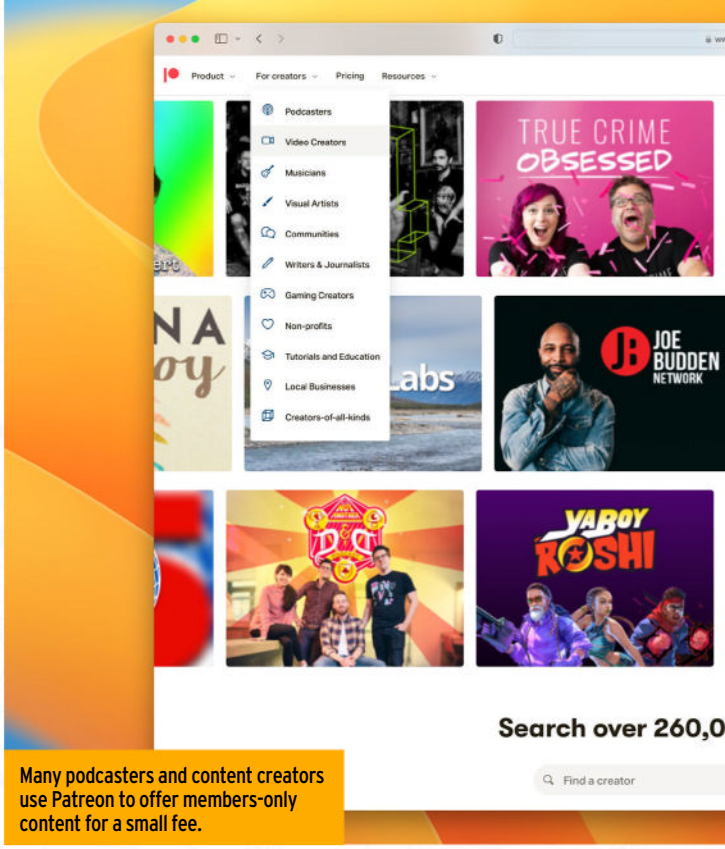
9 Test your clip

The export process takes a while, especially if you're using 1280x720p resolution, so this would be a good time to make a cup of tea. Once your clip has finished, test it first before uploading to the social network of your choice.

› Image credit: Apple Inc

BECOME INTERNET FAMOUS

You've baked your content cake. How do you get people to consume it?



Many podcasters and content creators use Patreon to offer members-only content for a small fee.

Making a podcast, a vlog or a live stream won't magically attract an audience. And unfortunately, attracting an audience is where the bulk of the work is.

There's no single trick to this, but there are lots of little things you can try, and everything starts with knowing who your potential audience is and where to find them online. Collaborating with other creators, for example by going on their podcasts or having them in your videos, is a great way of introducing yourself to other audiences. And using your existing social media is a good way to introduce what you do to the people who follow you.

Go where your target market is – so if they're on Reddit, be a good contributor to appropriate subreddits; if you're on social media, contribute positively to trending hashtags and topics; if you're looking for gamers, join their Discords.

Promotion is one area where broadcasting is actually bad; you want to be working one to one, not one to many. Blasting people with promotional messages and links is a turn-off for most, so if you want to grow your audience you need to be interacting constructively.

If you're doing longer content, consider clipping it: a punchy 15-second TikTok or Facebook Reel can be an effective way of promoting the bigger picture of your YouTube video or your podcast, just like trailers do for movies. Funny is always good, but so is surprising or helpful.

> Collaborating is a great way of introducing yourself to other audiences

Don't forget about your visual identity too. There's a reason why YouTube thumbnails for particular genres all look the same and have incredibly similar headlines; that particular format is what people on YouTube are used to, and expect.

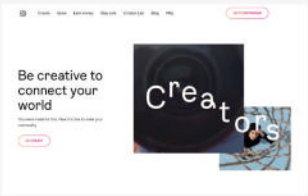
Money, money, money

It's very hard to make money from online media if you're not doing big numbers, but if you are then there are quite a lot of options. The simplest one is to get a cut of advertising revenues. So for example, in YouTube, you can join the YouTube Partner Programme if you have 1,000 subscribers and 4,000 public watch hours in the last year. You can then run ads on your channel.

For game streamers, Twitch Affiliates can integrate ads, and you might be

Sharing your videos online

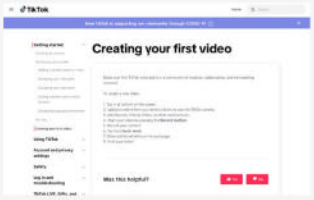
Whether you're uploading funny videos, streaming from your desktop or producing podcasts, there are plenty of places to post and stream your content. Many of them have lots of handy hints, tools and tips to help you learn the ropes and build your online brand too.



Instagram

› creators.instagram.com

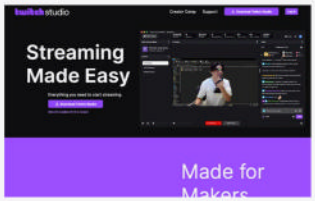
› The original home of the influencer has lost some of its cachet with the rise of rivals such as TikTok, but Insta is still the place to be for all kinds of creatives and its Instagram Creators section offers useful advice on how to attract an audience.



TikTok

› tiktok.com

› Going viral on TikTok is the goal of many content creators, and that means lots of competition – but, if you go viral on TikTok, you have a serious hit! You'll find a dedicated creator portal offering tips and advice at tiktok.com/creators/creator-portal/.

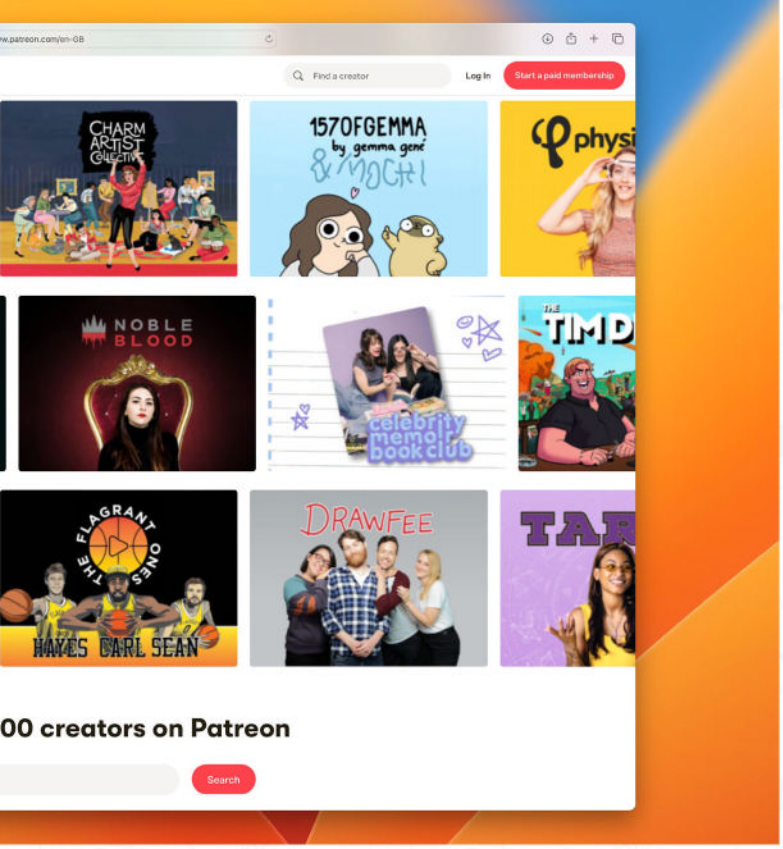


Twitch

› twitch.tv

› Anyone can stream on Twitch, and you don't need to a huge audience – affiliates only need to have three average viewers per stream in order to unlock special features – but you'll need 75+ per stream if you want all the advertising options.

› Image credit: Patreon, Meta, TikTok, Amazon.com Inc



approached by someone who wants to sponsor your channel too. Instagram has a similar programme but the entry requirements are higher: 10,000 followers.

Just watch out if you're going to be promoting other people's products in your feeds; in the UK, all paid commercial content must be clearly labelled as such. That includes endorsements, product placements, reviews of 'free' gifts and so on.

For many online broadcasters, the money comes from physical things rather than ads; for example the ADHD As Females podcast sells merchandise and goes on tour, selling tickets online. Podcasts, such as the popular Maintenance Phase, also sell merch, and they use Patreon to offer paid subscriptions that deliver extra episodes and other exclusive subscriber-only content.

Just be careful: if you're too aggressive in trying to monetise your broadcasting, you could end up driving some of your hard-won listeners or viewers away.

YouTube

› youtube.com

› With a YouTube account, you can create your own channels and then upload video or live stream. The analytics offer lots of useful info including where viewers give up, and if you have enough followers you can monetise with adverts.

Apple Podcasts Connect

› podcastsconnect.apple.com

› Podcasts Connect is an iCloud-style dashboard that makes it easy for you to upload podcasts and see how well they perform, with graphs to show who's listening, what they're listening to and where they're coming from.

Q&A: CHRIS PHIN, CREATIVE DIRECTOR

Chris Phin has moved from publishing to podcasting.

Former *MacFormat* editor Chris Phin now works as a creative director in podcasting, where he presents, produces and advises others on how to broadcast better.

MF› Is there a particular piece of valuable wisdom you could share with us?

With very few exceptions, everybody feels like a chump when recording, and hates how they look and sound when they're editing or reviewing. Be kind to yourself. I promise that you'll get used to it, and I promise the result isn't as bad as you fear – both because, well, first, it just isn't! There's literally nobody outside your head who's a harsher critic. But also because unless you're working live, you can do it again and again, or tweak takes, until you merely hate the clip, rather than hating yourself!

MF› Is there a particular piece of hardware or software you can't imagine doing your work without?

Bad audio is more tiring to consume than lacklustre video. Get your mic right. Though there are exceptions, a dynamic mic with a cardioid pickup pattern, such as the entry-level Samson Q2U (about £100, samsontech.com), is a good choice – but learn how to use it. It should be a fist width from your mouth and angled away at 45°.

MF› What kind of mistakes do people tend to make when they're new to all of this?

The sooner you can take the plunge into more advanced apps (say, Logic vs Audition – though actually GarageBand is great); processes (say, recording each voice on to its own track); and platforms (say, Riverside.fm rather than Zoom), the quicker you'll realise pros don't use them just because pros like being fancy. They are daunting, but as well as usually being capable of better results, they are ultimately faster and, counter-intuitively, easier too. The learning curve is steep though.

MF› What one piece of advice would you offer would-be vloggers and content creators?

Script the intro, script the outro and wing it a bit in the middle!

› Image credits: Google LLC, Apple Inc

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THE iPAD MAGAZINE YOU READ ON THE iPAD

iU magazine

Find us on the App store by searching 'iPad User Magazine' or scanning the QR code!

Clean up your hard drive

Whether you're rapidly running out of space or simply want to put your files and apps in better order, the answer lies with a clear out of your Mac's storage

WRITTEN BY **NICK PEERS**

However much storage you have on your Mac, you'll always find a way to fill it. You might vow every time you buy a new model to keep it running swift and smooth, but over time your best intentions get overwhelmed, whether that's down to a lack of time or falling into bad habits.

Even if your Mac's storage is still relatively empty, you'll have noticed it start to fill up. Perhaps you've taken a brief tour of your personal user folders and realised there's junk on there that needs clearing out. Or maybe you're just desperate to find a new home for files you no longer need on a daily basis but might want to access to later.

Whatever your motivations for clearing out your Mac's storage drive, we're here to show you everything you need to know, from easily identifying those files that you no longer need, to ensuring no-longer-needed apps get thoroughly removed when you're done with them. Over the next four pages you'll discover the best tools to comb through your system, and learn how to move your largest files without disturbing your current setup.

So without any further ado, let's get your virtual dustpan and brush out and start cleaning up!

Image credit: Apple Inc

Clear out junk quickly

Let's begin by identifying – and removing – those files you no longer need

Before you can start to clear the rubbish off your Mac, you need an overview. Open System Settings and navigate to General › About, then click Storage Settings. At the top, you'll see a colour-coded chart representing your internal storage and how the space on it has been used up. There are five categories: Documents (basically all personal files, including media), Apps, macOS itself, System Data and a miscellaneous 'Bin and Others' category.

Beneath this chart, you'll see these and other categories (iCloud Drive, Mail, Messages and Other Users), all displayed with the actual amount of space they're taking up shown in gigabytes (GB) or megabytes (MB). Next to most of these is an 'i' button; click this and a new window will open enabling you to view the selected category in more detail, such as a list of applications with the largest apps displayed first. Documents gives you a choice of four views: Large Files, Downloads, Unsupported Apps and File Browser.

Find elusive files

› System Settings does a good job of revealing the largest files and apps on your system, but if you want a more visual overview of your storage drive's layout then you need a tree map. This provides you with the ability to identify not just large files on your drive but discover where they're hiding in your file system. If you find the tree map provided by Grand Perspective (right) a little confusing to follow, try DaisyDisk (£9.99, daisydiskapp.com) instead, which uses a sunburst map to help you navigate to any large files on your drive.

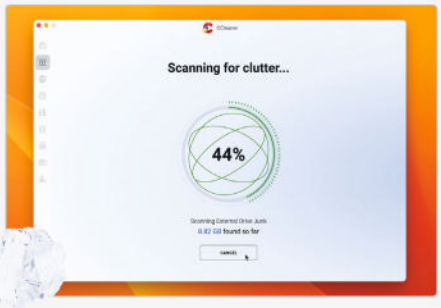
A fail-safe backup

› What happens if you accidentally delete the wrong file – one that might contain a precious, irretrievable memory if lost forever? The answer lies in making sure your Mac is backed up. The simplest way to do this is through Time Machine (System Settings › General › Time Machine). By default, it's set to back up every hour, so should have you covered. Should you need to recover any accidentally deleted files, open your Time Machine backup drive, then click 'Enter Time Machine Backup', then browse to the folder containing the file you deleted to retrieve it.

Automatic clean-up

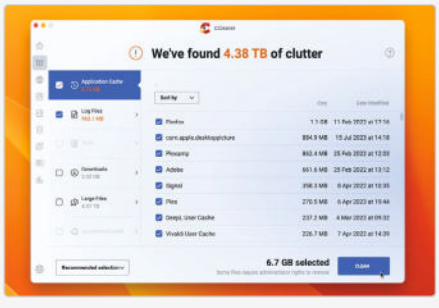
› There's one automated clean-up function built into macOS, and that's the ability to prevent the Bin from filling up over time. Open Finder, then select the Finder › System Settings › Advanced tab and tick 'Remove items from the Bin after 30 days'. If you want to automate any other folder cleaning, however, you'll have to investigate Hazel for $42 (about £40, 14-day trial, noodlesoft.com). This makes it easy to build a script that will – for example - allow you to automatically move files that have been in the Downloads folder for more than four weeks into the Bin.

HOW TO Clean up your hard drive with CCleaner ›



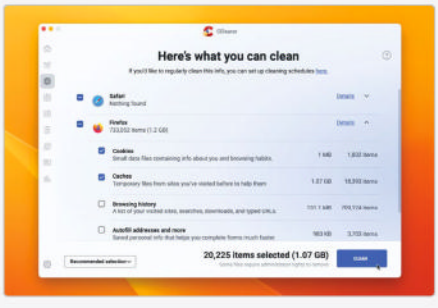
1 Quickly remove clutter

Open CCleaner (ccleaner.com) after installation and click the Scan button next to 'Clean clutter', giving access to any drives CCleaner requests. You'll see a progress bar appear revealing how much potential trash has been found.



2 Review and remove

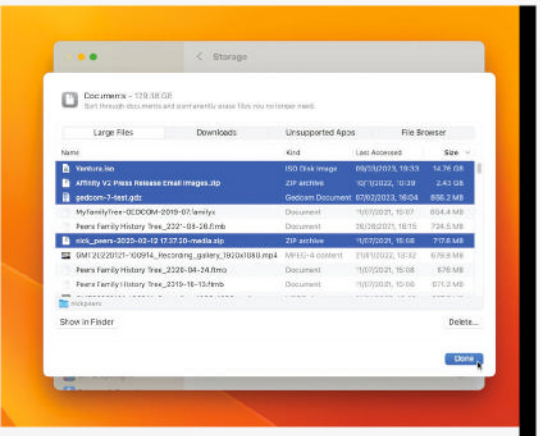
You'll be shown a summary of what's been found, with certain sections automatically ticked for removal. Click one to review the details of what's been found (and untick individual items). Click Clean to remove your selected files.



3 Clean up your browser

Over time, your web browser can accumulate quite a lot of junk. Click Scan under Clean Browser to see how much you might save. You can go with CCleaner's recommended selection, or click Details to pick and choose what to remove.

› Image credits: Apple Inc, Piriform Software Ltd



System Settings can help you quickly reclaim lost space by revealing the files taking up most space on your system.

From here, you can identify the largest files on your system and clear them off to free up space if you're running low – note that when you click Delete, you'll be warned that the files will be immediately removed – they won't end up in the Bin as a kind of fail-safe.

But this merely scratches the surface; to perform a more thorough clean of your system, we recommend looking at the list to the right here, which reveals five free clean-up tools that can do a better job than System Settings. Then follow the step-by-step guide below to discover how to use the free version of CCleaner to perform a deep clean of your Mac.

Top 5 Free cleaning tools

The following collection of tools are designed to help you with your clear up – they're all free to use and will help you reclaim even more space from your overburdened Mac storage through a variety of techniques.

Grand Perspective

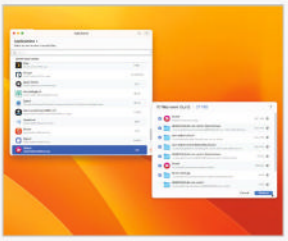
grandperspectiv.sourceforge.net

Let Grand Perspective scan your system drive for a visual tree map of your Mac's storage, with files represented relative to their size and location. Roll your mouse over one for its name and file path.

Monolingual

ingmarstein.github.io/Monolingual

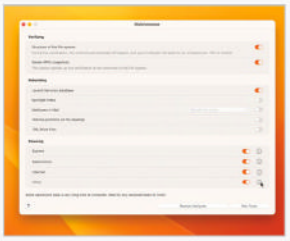
Monolingual makes it easy to reclaim hundreds of MBs of space by removing unused languages – your default language isn't selected, so review the list and click Remove. Read the warning and click Continue to finish.



AppCleaner

freemacsoft.net/appcleaner

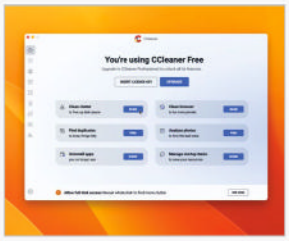
While you can thoroughly clean apps in CCleaner, AppCleaner lets you see exactly what files it's found when scanning for program leftovers. If you want complete control over app removal, this is the tool to choose.



Maintenance

titanium-software.fr/en/maintenance.html

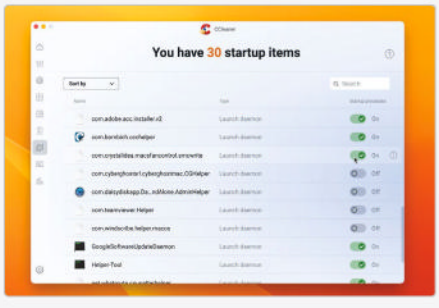
Maintenance is a cut-down version of the Onyx system tool – it's more user-friendly and offers four tools: System, Applications, Internet and Other. Click 'i' next to each one decide what to clean.



CCleaner

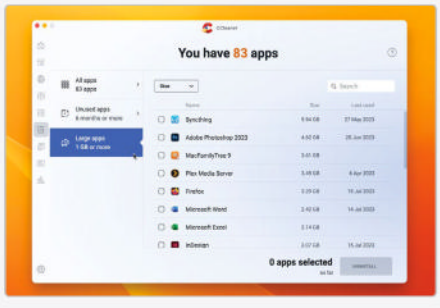
ccleaner.com

As general-purpose cleaning tools go, CCleaner has plenty going for it, not least the fact its key functionality is free. The step-by-step guide reveals how it can help quickly clear lots of clutter from your Mac.



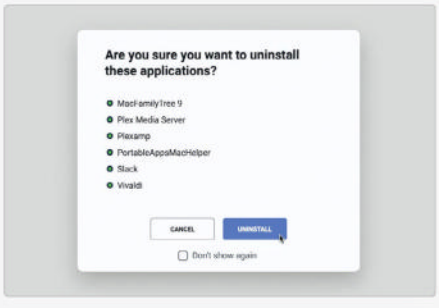
4 Weed out startup items

Click Show under 'Manage startup items' to reveal which programs and processes are set to start with your Mac. Reclaim memory and speed up log-in times by flicking the switch next to unused or unwanted items to Off.



5 Uninstall unwanted apps

Click Show next to Uninstall Apps for a quick and easy way to remove apps from your Mac. You can view three lists: 'All apps', 'Unused apps' (those not opened in six months or more), and 'Large apps'. Tick those apps you want gone.



6 Complete removal

Like AppCleaner, CCleaner doesn't simply remove the app from the Applications folder, but it also hunts down leftover files such as library items, plug-ins, preferences, and more to ensure more traces of the programs are gone.

Image credits: Apple Inc, Erwin Bonsma, Ingmar Stein, FreeMacSoft, Titanium Software, Piriform Software Ltd

Recover even more drive space

If space remains tight, find out how to restore – and increase – capacity

Find visually similar pictures >

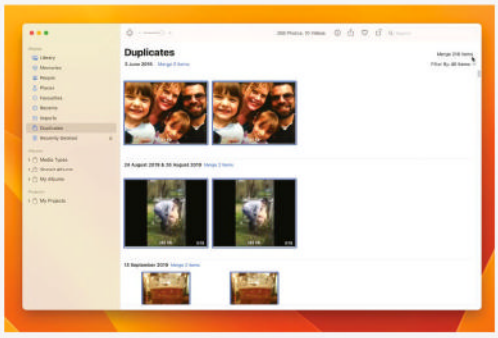
> If you're looking to find more than just exact duplicates, then we recommend giving dupeGuru (dupeguru.voltaicideas.net) a spin. This free tool offers two additional scan modes – Music and Pictures.

Music lets you scan your files for tags to weed out duplicates in different formats, while Pictures offers a 'fuzzy' scan that enables you to identify visually similar – but not identical – photos.

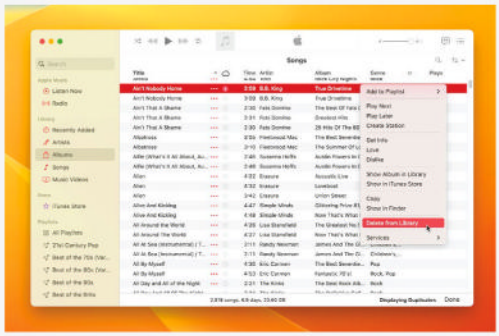
dupeGuru can help you remove close variants of a photo.

After your first clean-up, you'll be able to use the tools we've covered so far to keep your system in check, but over time you'll find the space being regained lessens even as your drive capacity continues to shrink. So what else can you do to ensure you're not left facing dreaded 'disk full' messages?

One major cause of wasted storage space is duplicate files. Don't confuse these with backups; they're simply redundant copies of files and may be spread across multiple folders or even storage drives. Duplicates don't have to be identical either – how many times have you taken multiple photos on your phone with the intended aim of keeping only the best shot only to leave them all piling up, slowly eating away at your Mac's storage space?



Duplicate files can be responsible for a lot of wasted space on your Mac – so weed them out.



When you're looking through duplicate items in Music, be sure to check for different versions of the same song.

There are two free tools we recommend for this task. The first is our old friend CCleaner (see p.72) and its 'Find duplicates' tool, which scans files by their contents as opposed to merely comparing filenames to identify exact duplicates. By default, your home folder is selected for scanning – if you're simply looking for possible duplicates within your Mac's storage drive, click Scan to see what it finds; alternatively, widen your search to include other drives and folders by clicking Add, remembering to exclude any folders containing actual backups.

The initial scan can take some time to complete – particularly if you're scanning non-solid-state drives – so be prepared to leave CCleaner for an hour or two to complete the scan. Once it's complete, a summary of how much file space is taken up by potential

Expand your storage

If your Mac has limited storage capacity, one long-term solution is to upgrade it. Since the internal storage in most Macs these days is fixed at the time of purchase, that may not be an option.

The solution lies in purchasing a new external drive, but rather than go for the biggest capacity, look for the fastest drive you can afford to maximise performance. This means pairing a NVMe drive with a Thunderbolt 3/4 enclosure that can deliver speeds to rival your Mac's internal drive – around 2,000-3,000MB/sec.

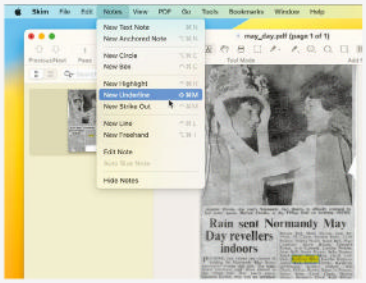
Expect to pay £170 (512GB) to £200 (1TB) for a Samsung 980 Pro NVMe drive (samsung.com) and Anyoyo enclosure (anyoyo.com). If you can make do with slower speeds (around 1,000MB/sec – still quicker than a SATA SSD), pair the Crucial P3 1TB drive (uk.crucial.com) with a Ugreen USB-C enclosure (eu.ugreen.com) for under £70. Check amazon.co.uk for a range of these types of combinations.

> Image credit: Apple Inc

Find some slimmer apps ›

› Obviously removing apps is one way to quickly free up space, but you don't necessarily have to give up functionality to do so. For example, do you really need Adobe Reader (517MB when installed) when you can view PDFs in Preview or your web browser?

Also look to see if you can source slimmer versions of the apps you currently use – for example, if you want a dedicated PDF viewing app, then Skim (skim-app.sourceforge.io) takes up just 29MB of space. Visit (alternativeto.net) to track down more alternative apps.



Don't burden your Mac with bloated apps – Skim takes up just 5% of the space Adobe Reader demands.

duplicates will be shown – click View Duplicates to see them all side by side or use the categories on the left to filter by specific file types. Use the 'Sort by' button to change the sort order (choose Size to zero in on those duplicates taking up most space, for example). Double-click an item to open its path in Finder, enabling you to compare each duplicate to determine which one to keep.

You can manually comb through the list selecting which duplicate you want to keep or click the 'Nothing selected' drop-down menu to choose 'Keep oldest' or 'Keep newest' to make a quick selection. Once you're happy with your choice, click Clean. Again, there's no fail-safe move to the Bin before files are removed, so proceed with caution.

Clean up Music and Photos

One way to remove visually similar photos is to use dupeGuru as outlined opposite, but if you're already managing your photos using Apple's Photos app, then you'll find tools for managing duplicate photos in there too – particularly for those photos synced to your Mac from your phone via iCloud.

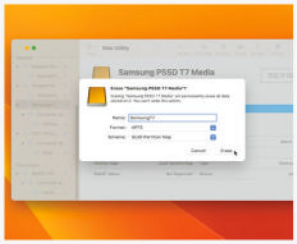
Simply open Photos and select Duplicates for a list of all photos that match Photos' definition of a duplicate: visually identical, but not necessarily having the same metadata, formats or resolutions. You can then 'merge' these individually or press Cmd+A to select them all and click 'Merge [xxx] items' in one go.

Photos will pop up a fail-safe dialog giving you the option of merging only exact copies of files, or you can go ahead and merge all items. Whichever option you choose, the redundant files will be placed in the password-protected Recently Deleted folder from where you can recover any you've mistakenly removed or delete them now, rather than wait for Photos to delete them automatically after around 30 days.

You can also rationalise your music in a similar way – open Music and choose File › Library › Show Duplicate Items. You'll get a list of all items that share the same title and artist, but be careful to properly scrutinise each one, particularly the track's length and album – you could find that different versions of the same song are marked as duplicates. Ctrl-click an item and choose Get Info for a detailed view, then choose 'Delete from Library' followed by 'Delete Song' for any tracks you're happy to lose.

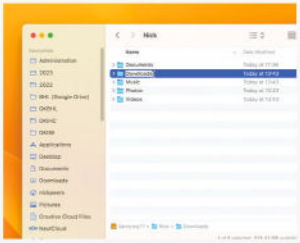
Move large files

› **Still running out of storage space despite your clean-up efforts?** Attach a USB SSD or NVMe drive to double or even treble your drive capacity, then discover how to move items across without disrupting your experience.



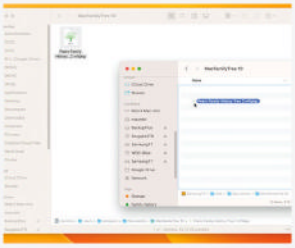
Prep new drive

If you're connecting a new drive for the first time, open Applications › Utilities › Disk Utility. Select the drive; assuming it's not already APFS-formatted, click Erase, make sure APFS/GUID Partition Map is selected and click Erase again.



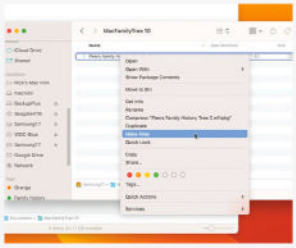
Set up folders

Browse to your new drive and set up a simple folder structure that mirrors your user folder on your system drive, so a parent [Your name] folder, inside which are separate sub-folders for Pictures, Documents and so on.



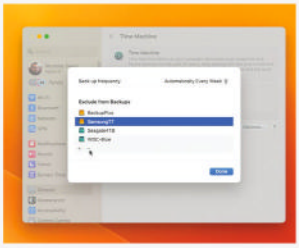
Copy file/folder

Locate your first large file or folder on your main storage drive, then copy it across to the relevant folder on your secondary drive. Once it's been copied across, you can delete the original on your main drive to free up space.



Create aliases

Once copied, Ctrl-click the file or folder and choose 'Make Alias' to create a shortcut. Move this back to its original location for easy access – the alias will always know where to find the original, even if you move it again.



Update backup

Once you've freed up space on your main drive, open Time Machine via System Settings › General. Click Options and check to see if your new drive is in the excluded list – if it is, select it and click – followed by Done.

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★★★★☆
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★★★☆☆
Worth considering

★★☆☆☆
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★☆☆☆☆
A waste of your money

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Image credits: Nothing Technology, Koninklijke Philips N.V., Nanoleaf, Firaxis Games/Feral Interactive

Nothing Ear (2)

Feature-packed wireless earbuds

› £129 › FROM nothing.tech › FEATURES Adaptive active noise-cancelling, personal sound profiles, LHDC hi-res codec, USB-C or wireless charging

Playback is rich and expansive with powerful low end, clear mids and sparkling highs. Music sounds joyous

The Ear (2) is the latest release by London-based Nothing, a company that specialises in wireless audio. These earbuds are an upgrade on its original Ear model, and also drop slightly in price. The first thing that strikes you is the design, with the case and buds both using clear plastic for a unique look. The whole thing is also very lightweight and well built, with the earbuds offering IP54 and the case IP55 dust and water resistance, making both of them suitable for use in light rain, for example.

The case charges via USB-C with the included cable and there is also 2.5W wireless charging capability, which is a nice bonus. The buds give up to 6.3 hours of playback with ANC off and up to 36 hours in total from the case, or up to four hours and 22.5 from the case with ANC on. The buds' capacity isn't stellar by modern standards, though a 10-minute fast charge of the case will give eight hours of total playback, which is handy when you're in a rush.

Pairing is as simple as opening the case. You will also want to download the Nothing X app, which provides access to a wealth of customisation features. The buds have an unusual pinch-to-press system that can be set up in the app to control things like track skip, volume, ANC mode and answering calls. It works well and some people prefer it to the touch surfaces used elsewhere (as these can be too easy to press accidentally while securing the buds in your ears). The Ear (2) comes with three sizes of tips and the earbuds are comfortable and secure when worn.

The earbuds look great, sound great and are more affordable than the closest rivals – what's not to love?

Fully featured

The list of features continues with in-ear detection and dual device connection. It's possible to manage in the app which two devices will auto-connect. There's personalisation available too, with the app offering multi-step processes to tailor both the playback and ANC profiles to your hearing. Three mics in each bud help power the highly effective environment-adaptive ANC and ambient modes, with variable strengths available. They also facilitate making calls, with voice clarity sounding good in our tests.

The buds use 11.6mm dynamic drivers and support multiple codecs including LHDC for up to 24-bit streaming as well as having the latest Bluetooth 5.3 version. While standard playback is decent, it's a good idea to run through the personalisation process, since this offers greater clarity and detail. Crucially, however, once you have done the analysis you have more options – namely low, medium or high levels of enhancement and within each one a variable amount slider. So it's not simply on or off but you can really fine-tune the processing, even if the lack of a manual EQ is a shame.

In our test we found that the medium setting with around a 50% enhancement level offered the perfect balance versus the unprocessed sound. The playback really is stunning, rich and expansive with powerful but balanced low end, clear mids and sparkling highs. Music sounds joyous, bursting with energy and there's bags of volume available. The fidelity and soundstage are remarkable and easily rival buds costing significantly more.

While battery life in the earbuds could be a little better, these sensibly priced in-ear headphones remain an excellent choice and an easy recommendation whatever your listening needs might be. **Hollin Jones**

Mac FORMAT

VERDICT

› Superb-sounding earbuds with a wealth of features at a very reasonable price.

★★★★☆

- ⊕ Wonderful, rich sound
- ⊕ Excellent noise cancelling
- ⊕ Loads of features
- ⊕ Attractive price
- ⊖ Buds battery life a little short
- ⊖ No manual EQ

The buds allow extensive customisation using the Nothing X app for iOS.

› Image credit: Nothing Technology Ltd

The monitor has a very thin bezel designed for minimal distractions.

Philips Evnia 25M2N5200P

Can this mid-level gaming monitor beat the opposition?

› **£269.99** › **FROM** philips.co.uk › **FEATURES** 24.5in IPS LED Full HD display (1920x1080 pixels @ 89.91ppi), HDR10 support, 400cd/m² brightness, 0.5ms response time, 2x HDMI 2.0, 1x DisplayPort 1.4, USB hub with USB 3.2 Gen 1, 1x USB-B, 4x USB-A (2 with fast charge)

An excellent contrast and colour gamut mean a game's scenery always looks rich and detailed

Philips' Evnia is the latest set of monitors and peripherals designed with the gamer in mind. Its name comes from the Greek word for 'smart thinking', which is apt. A lot of intelligent planning has gone into this new gaming display.

Evnia monitors come in three tiers. At the top of the range are the 7000 and 8000 series, which offer unrivalled quality with a price tag to match. The 5000 series are cheaper but still good quality, and the entry-level 3000 series are great for those on a budget.

This particular 5000-series monitor has a 24.5-inch, 1080p screen, a 280Hz refresh rate and a fast IPS display, which looks great even at the shallowest of angles. The stand is sturdy and ergonomic, and is assembled without any tools. You can turn the screen left and right on its base, and rotate it into portrait mode. You can also adjust its height to get your viewing position just right. The bezel is very narrow for minimal distractions, except for the overly bright LED used to show when it's switched on.

For input in, the monitor has two HDMI 2.0 ports and a DisplayPort 1.4. You can connect via USB and use the four-port USB 3.2 hub as well, two of which support fast charging. There are no speakers with this Evnia, but there is an 3.5mm audio output, which can be controlled through the monitor's settings.

With a 1080p resolution you wouldn't expect Retina-quality reading, but it does a good job of rendering text. You can see pixels, but the characters are clear and defined. Our standard Photodisc image was reproduced with excellent colours and accurate tones, and gradient ramps were smooth and consistent. The Evnia 25M2N5200P also did a great job of distinguishing between very light and white, and very dark and black.

In motion

Because the Evnia is a gaming monitor, it's moving images that we're interested in here. *Tomb Raider* ran smoothly, with no choppy frame rate, no screen tear and no ghosting. The fire effects were especially impressive and flickered away beautifully. An excellent contrast and colour gamut mean the scenery always looks rich and detailed, without ever appearing washed out. Happier, cartoony games with blue skies and smiling protagonists look equally good. Colours are vivid, movement is smooth and the action draws you in. If you want to fine-tune the visuals, choose between different preset visual modes in the monitor's settings.

While text reproduction isn't as easy on the eyes as a Retina display, this Evnia monitor is perfect for games, movies and general use, especially at this price. **Ian Osborne**

Mac FORMAT

VERDICT

› A great, affordable gaming monitor, or a second screen for productivity; robust and versatile too.

★★★★☆

- ⊕ Excellent for gamers
- ⊕ Great value for money
- ⊕ Very well built
- ⊖ Not Retina resolution

› Image credit: Koninklijke Philips NV

Belkin BoostCharge Magnetic Wireless Power Bank 2.5K

Low-cost MagSafe-ready battery booster

› **£34.99** › **FROM** belkin.com › **FEATURES** MagSafe compatible (works with iPhone 12 or later), 5W wireless charging, 2500mAh capacity, 1m USB-C to USB-C cable included, LED light indicator, 65x97x13mm

Mac FORMAT VERDICT

› **A great accessory to have in your pocket – even if it is a little slow.**

★★★★☆

⊕ **MagSafe ready**
⊕ **Emergency power**
⊕ **Small, neat, relatively unobtrusive**
⊖ **Slow iPhone charging**

While Apple's made great efforts to boost the iPhone's battery life, gaming, web surfing and movie viewing all take their toll - and if you're shooting 4K video too? You'd better have a spare battery to hand. Belkin's BoostCharge Magnetic Wireless Power Bank 2.5K is just the thing. For £35, you get a 2500mAh battery pack that attaches to your iPhone 12, 13 or 14 using MagSafe and gives the battery a boost. We say 'boost', because the power bank isn't enough to recharge your battery from 0-100%, but it *will* top up its power.

Available in black or white finishes, it has a USB-C port for charging, with a button and LED indicator lights to show how much charge remains in the battery.

In use, the BoostCharge stayed securely on our iPhone despite being popped in and out of our pockets. However, at 65x97x13mm and 110g, it does add a little bulk.

The BoostCharge is handy if you need a top-up but it likes to take its time.

While Apple's MagSafe Battery Pack (£99) offers up to 7.5W of charge, the Belkin maxes out at 5W – and that means charging times are slow. However, given its low cost vs Apple's version, we know which pack we'd pick. **Rob Mead-Green**

ESR iPad Rebound Hybrid Case 360

Affordable protection with a twist

› **£51.29** › **FROM** esrgear.com › **FEATURES** Available for the iPad Pro 11-inch and 12.9-inch, comprising a clear back case with magnetic cover (7 colours available)

Mac FORMAT VERDICT

› **An affordable alternative to Apple's Smart Folio with a flexible form factor.**

★★★★☆

⊕ **Affordable protection**
⊕ **Landscape and portrait stand**
⊖ **Slightly fiddly design**

When spending money on an iPad, it pays to protect your investment, and the Rebound Hybrid Case 360 promises to do just that.

Designed for iPad Pro 11-inch and 12.9-inch, it comes with a back case featuring a clear shell, protective camera cutout and rubberised bumpers that can be used on its own; and a matching wrap-around magnetic cover, which takes some of the features of Apple's £89 Smart Folio case and gives them a novel twist.

The magnetic cover has a magnetic flap on its leading edge that can be used to keep your Apple Pencil in place and the cover closed (something Apple's own Smart Folio lacks). It also comes in handy when you're using the magnetic cover as a stand.

That's because while Apple's Smart Folio has been designed to be used mainly in landscape orientation, the flap on the Rebound case enables you to use your iPad in portrait mode too – it's a neat idea even if the overall design is a little fussy.

ESR's iPad case offers all-round protection and extra features.

Available in seven different colours, the case feels robust with a soft but tough finish. However, you need to use the hybrid case and magnetic cover together for maximum protection. **Rob Mead-Green**

› Image credit: Belkin, ESR

Nanoleaf 4D

Screen-matching smart lights are colourful fun

› **£89.99** (up to 65-inch) / **£119.99** (up to 85-inch) › **FROM** nanoleaf.me/en-GB › **FEATURES** Addressable Gradient Lightstrip, Screen Mirror Camera with magnetic privacy cover, Nanoleaf 4D controller, 2.4GHz 802.11b/g/n Wi-Fi, HomeKit compatible

The effect is pleasing and fun, and does everything you'd expect an Ambilight TV to do.

Back in 2004, Philips wowed TV watchers with Ambilight, its first TV equipped with a rear-mounted light strip. The TV claimed to produce a more immersive viewing experience by splashing colours on the wall behind it to echo those on screen. The effect was also said to reduce eye-strain. Philips has continued to iterate on that idea ever since, with its latest Ambilight TV line-up starting at 65 inches and costing from £599.99. Philips says it has more than 10 million Ambilight 'lovers' worldwide.

While Ambilight is a lot of fun, it's hardly essential, especially when it means having to buy a whole new television in order to take advantage of it. However, smart-lighting geniuses Nanoleaf have come up with a better way... Nanoleaf 4D takes the Philips Ambilight idea and runs with it, enabling anyone with a television (i.e. almost all of us) to achieve a similar effect with minimal outlay. To that end, it has created two Nanoleaf 4D kits – one at £89.99 for TVs with screens up to 65 inches and one at £119.99 for screens up to 85 inches.

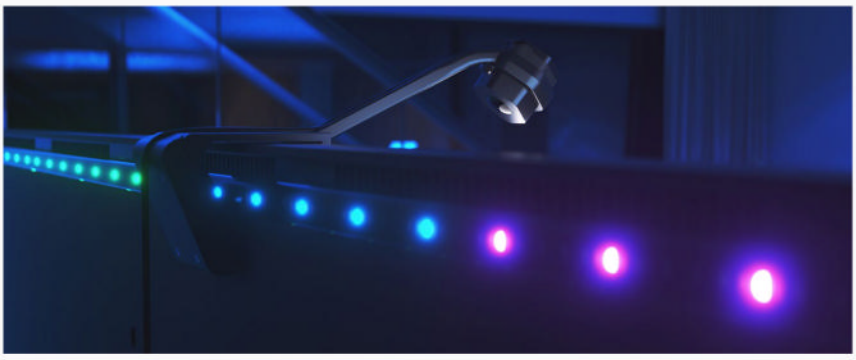
In the box, you'll find Nanoleaf's first addressable light strip, which comprises a string of LED lights (10 per metre) with an adhesive back, a black Screen Mirror Camera and a matching Nanoleaf 4D controller. Also included in the kit are four corner pieces for the rear of your TV, plus all the cables you need.

To get the Nanoleaf 4D up and running, you must first attach the four black plastic corner-pieces (using the double-sided sticky pads supplied) to each of the four corners of your TV. You can then run the addressable light strip around the corner pieces, peeling off its backing as you go, pressing the adhesive side to your TV's rear. Any excess light strip can simply be trimmed away. The USB-C connector cable is then plugged into the Nanoleaf 4D controller, along with the power cable and the lead for the Screen Mirror Camera.

Attaching the light strip to your TV is fairly simple using the pieces in the box.

Ah, the camera. Nanoleaf's Screen Mirror feature has been available on its Mac app for a while – but its utility has been rather limited. That's because Screen Mirror only works on the screen of your laptop or desktop, or on a display connected by HDMI. You can't use Screen Mirror via AirPlay and it doesn't work with High-bandwidth Digital Content Protection (HDCP)-enabled sources, meaning it won't play nice with TV and movie content available on Apple TV+, iTunes or other streaming services. The Screen Mirror Camera gets around that.

Simply put, the Screen Mirror Camera watches the colours displayed on your TV, then sends that information to the Nanoleaf 4D controller, which translates those into the colours the addressable light strip splashes on the wall behind your TV. The camera can be mounted above or below your TV and points directly at it (like a reverse webcam). The camera doesn't record anything and has only been designed to watch your TV, although there is a magnetic privacy cover included if you feel you need that. You can tweak what the



The camera keeps an eye on your TV screen so it can match the colours to the light strip.

Choose how many colours you want to appear and how vibrant you want them to be.

camera sees on your screen using the Nanoleaf app for iPhone and iPad, where you'll also find calibration and other set-up options for the Nanoleaf 4D itself.

Let the fun begin!

Getting the system up and running is fairly straightforward with the Nanoleaf 4D hooking into Apple's HomeKit. This means it can be conveniently controlled from the Home app on your Apple devices (Mac, iPhone, iPad, Apple Watch, HomePod or HomePod mini) or via Siri. You can also group it with any other smart-lighting setups that you happen to have at home to create a Scene ("Hey Siri, switch to Cinema mode"), or have the lighting switch on automatically when you arrive home or at sunset. Now let's get watching...

In the Nanoleaf app, you'll find that Nanoleaf 4D has five Screen Mirror modes: 1D, 2D, 3D, 4D and Off. You can also switch the lights to Rhythm mode so they respond to sounds as well as pictures (handy for sitting-room discos when watching Apple Music videos, for instance). Plus, there's Sync+, which enables you to invite other Nanoleaf smart lights to the Screen Mirror party.

You can also choose how bright the LED fireworks behind your TV are by choosing between Cinematic, Vivid and Custom from the Vibrancy settings. And you'll find Basic, Scene and Rhythm options, just like you would get on other Nanoleaf systems.

The Screen Mirror's 1D, 2D, 3D and 4D modes are a bit of a curio: 1D splashes a single-colour (usually white) onto the wall behind your TV; 2D does something similar, but uses the dominant on-screen colour; 3D mixes ambient lighting with some dynamic effects based on what's happening on-screen; and 4D delivers a fully immersive dynamic effect, again based on what's happening on-screen. As for Vibrancy, Cinematic is best for evening TV viewing, while Vivid works best during the daylight hours. Custom, of course, enables you to tweak colour saturation and other options to suit your personal taste.

And it works brilliantly. Screen Mirror is pleasing and fun and really enhances your viewing experience, and does everything you'd expect an Ambilight TV to do – Splashing the wall behind our TV with splashes of red, white and orange during the climatic battle on Crait in *Star Wars: The Last Jedi,* for example, while delivering more subtle effects elsewhere.

Whether you've been longing to bring screen mirroring from your Mac to your TV, or you just want to have more fun when watching movies or gaming, the Nanoleaf 4D is for you.

Rob Mead-Green

Mac FORMAT ★★★★★ EDITOR'S CHOICE

Mac FORMAT

VERDICT

A fun and affordable smart-lighting system that could change the way you watch movies and TV.

★★★★★

- ⊕ Fun and immersive
- ⊕ Fairly easy to set up
- ⊕ Works with HomeKit
- ⊖ Some interface quirks

Image credit: Nanoleaf

Xencelabs Pen Tablet Medium Bundle

Everything you need from a drawing tablet

› **£329.90** › **FROM** xencelabs.com › **FEATURES** Pen Tablet Medium (320.5x232.5x8mm, 710.5g) Quick Keys remote, 1x Thin Pen (12g) and 1x 3-Button Pen (17g) both with 8,192 levels of pressure sensitivity, Wi-Fi or USB-A connectivity (USB-C adaptor supplied), up to 16 hours of battery life

The Medium Tablet Bundle comes with a tablet, two pens, a Quick Keys controller, plus a pen case.

The intial set-up was painless, the driver comes with presets for all the major apps

Mac FORMAT ★★★★★ EDITOR'S CHOICE

Mac FORMAT

VERDICT

› **Possibly the best tablet on the market, suitable for enthusiasts and professionals alike.**

★★★★★

- **Stuning build quality**
- **Wireless or wired connectivity**
- **Fuss-free setup**
- **Class-leading drawing experience**

When it comes to fully featured graphics tablets, Xencelabs is on a tear right now – and it's easy to see why. The company's Pen Display 24 wowed us last month (*MF394*) with its incredible build-quality and cool features. Now it's the Xencelabs Pen Tablet Medium Bundle's turn. And it's great.

For £329.90 you get a medium-sized graphic tablet (measuring 320.5x232.5x8mm), a Quick Keys remote control, two styli (the 3-Button Pen and the Thin Pen with two buttons) and a pen case, which comes with all kinds of add-ons and accessories. An equivalent Intuos Pro tablet from Wacom would cost £329.99 just for the tablet alone – accessories like a second thin pen and spare nibs will cost extra.

The Xencelabs Medium Tablet Bundle's pen case is, ahem, a case in point. Not only does it contain the two aforementioned pens, it also has 10 spare combo nibs, six standard nibs and four felt nibs. Plus a Bluetooth dongle, a nib extracting ring and a USB-C adaptor inside.

As for the pens, both have an eraser button on top and offer up to 8,192 levels of pressure sensivity, along with 60 degrees of tilt, making it easy to turn doodles into gorgeous graphics.

Going hand-in-hand with the tablet and pens is the Quick Keys remote. This marks a key point of difference between Xencelabs' and Wacom's tablets, as while Wacom's extra function buttons and controls are built into the tablet, Xencelabs' are largely separate. On the Quick Keys remote you'll find a jog wheel, eight programmable buttons (with up to 40 presets) and an OLED display for ease of use.

The Pen case keeps everything in place – including spare nibs.

The advantage of having these functions on a separate controller becomes obvious when you use it – whether you're left- or right-handed, the controls can be moved to exactly where you need them, minimising the risk of covering up the buttons when drawing.

Under pressure

The Medium Tablet measures 8mm thick and is just a little larger than a sheet of A4 paper. It has a sturdy metal base and rubber feet, plus a palm rest so your wrist always remains comfortable during long drawing sessions. The drawing area is framed by four corner LEDs, which are customisable with eight different colours. There are also small programable buttons along the top.

Set-up is painlesss. The driver comes with presets for major apps that support tablet input and we never suffered any lag while using it, or instances of un-registered contact. Pressure sensitivity is easy to judge, and easily repeatable, which makes for a natural drawing experience.

This is a stunning piece of hardware, and proves Xencelabs is a serious contender. The bundle is great value, while the build quality and design are exceptional. **Paul Blachford**

› Image credit: Xencelabs

The two additional screens can match your MacBook Pro's display settings.

Monduo 16 Pro Duo Display

Supersize your MacBook Pro display

› **$799** (about **£750**) › **FROM** monduo.co › **FEATURES** 2x 16-inch IPS displays at up to 2560x1600 pixels, 144Hz refresh rate, USB-C power, HDMI

Adding serious screen real estate to a laptop generally requires using conventional desk monitors, but the Monduo 16 Pro Duo Display is a different proposition entirely. In its folded form it is roughly the same size and weight as a 16-inch MacBook Pro but made of plastic to keep it as light as possible. Open it out and it sits over the back of your laptop's display, with one side sprung to allow a snug fit. At the base of the central panel is an extendible foot which makes the whole thing steady when placed on a flat surface, less so if resting it on your knee. The Monduo's twin screens can be positioned flat or in a more curved arrangement.

Each display has two USB-C ports and an HDMI port which can carry video and power from your laptop. For those with fewer ports you can run HDMI from one display to the other though you'll need to power the second display separately. The displays can also accommodate 100W passthrough power, and a range of cables are included to facilitate such setups. macOS recognises the new displays automatically and you can use the Displays settings to arrange them. There are touch controls on the bezels for brightness, contrast and other tweaks though you'll want to download the Monduo control panel app which provides easier menu bar control and also unlocks a higher maximum resolution than that stated in the specs.

Neat solution

When set up to your liking, the displays perform well and are highly responsive. We found it necessary to set them to their max brightness of 500 nits and slightly cool the colour temperature to match our MacBook Pro. The P3 wide colour gamut looked rich and accurate and there's up to 144Hz refresh rate for gamers. These higher settings did cause our Intel-based Mac to fire up its fans sometimes but that's not uncommon.

It's definitely designed to be used in static fashion on a flat surface and is ungainly to move around when unfolded. When detached and folded, however, it can slip easily into a bag with your laptop. While you'll want to be powering your laptop to avoid battery drain, the fact screens work entirely over two short USB-C cables is the neatest solution possible.

Adding two 2K screens with minimal cabling or bulk is a game changer, not just for creatives but anyone juggling multiple apps, and going back to a single screen feels quite limiting. A slightly more solid build would be ideal but would also add weight. There's also the high price, however it's a unique product that performs admirably. **Hollin Jones**

Mac FORMAT

VERDICT

› An excellent – if pricey – way to triple your screen space with a minimum of fuss.

★★★★☆

⊕ Triples your screen space
⊕ Powers from laptop
⊕ Excellent image quality
⊖ Relatively expensive

› Image credit: Monduo

THE BEST VIDEO-CALLING APPS

Chat with friends, family and colleagues on your Mac

Group test

Reviewed by
ALEX BLAKE

ON TEST...

- Discord
- FaceTime
- Google Meet
- Microsoft Teams
- Skype
- Zoom

Image credit: Getty Images

When the pandemic struck in 2020, the world got a fast lesson in video-calling apps. If you didn't know how to use one before, you certainly did after and, for many of us, the world of work was changed forever.

These days, video-calling apps are still with us – for many people, they're an absolutely essential part of day-to-day life. But they're not just for work, and are ideal for catching up with friends and family in your downtime. Whether you need to discuss your tasks with colleagues or just want to hang out with mates for casual group chats or organising get-togethers, you can bet there's an app tailored to what you need.

With so many options, which one should you pick as your videoconferencing app of choice? That's what this group test is all about. We've put together six of the best video-calling apps, from the casual Discord to the work-focused Teams, with plenty more spanning the spectrum in between. By the end, you'll know exactly which one fits your needs. So, let's dive in and sort the video wheat from the virtual chaff.

How we tested

Using Continuity Camera with an iPhone 12 Pro for consistency, we set up each of the video-calling apps on our Mac and called friends and family members to assess each app's capabilities. Aside from video and audio quality, we tested the apps' extra features, including call recording, noise cancellation, screen sharing, and more. We also investigated their mobile companion apps, although the focus remained primarily on the Mac versions.

Things to consider...

1 Call time limit
While some apps like Discord and FaceTime let your calls go on indefinitely, other apps impose limits and ask you to pay for more time.

2 What's the purpose?
Do you need a video-calling app for work or chats with friends? If it's the former, cloud storage and screen sharing may be important. For the latter, look for text chat and fun extras.

3 Invitation only
It's better if your chosen app makes it easy to invite other people to your calls. Integrations with email and calendar apps can help here.

4 Paid or free?
Every app here has a free tier, but only FaceTime forgoes paid options entirely. Check if the features you need are locked behind a paywall – and how much it costs to unlock them.

Discord

› **Free** (offers IAPs) › **FROM** discord.com

1 **Discord is primarily a communication tool for gamers, and it incorporates chatrooms and emojis alongside its video-calling features.** However, that helps give it an extra dimension that makes it a strong option for hanging out with friends.

Discord is centred around servers, each of which works as a set of chatrooms linked by a common topic. You can set up a server for your friends and have rooms to discuss whatever you want. Voice channels allow for video calls and text chat too, making it super convenient to chat with other members.

Video quality is good and you get unlimited call time for free. Discord has subscriptions, but there's no free trial, and even with a paid membership, the limit of 25 group call participants is low. There's no end-to-end encryption and no email or calendar integrations. It's best for informal chats, particularly if you enjoy streaming (since Discord has built-in screen broadcasting). For work, it's less than ideal.

VERDICT

- ⊕ Great chat features
- ⊕ Fast and easy to use
- ⊕ Unlimited call time
- ⊖ Few business features

★★★★☆

FaceTime

› **Free** › **FROM** apple.com/uk

2 **FaceTime's advantage is it's already on your Mac, and for many people it'll be the default choice.** It makes a strong case to stay that way, since it's completely free (with no in-app purchases) and offers unlimited call time. It fits in nicely with other Apple features like SharePlay, and its video quality and resolution are excellent.

However, it falls behind in other areas. It doesn't have its own background blur, meaning you rely on Continuity Camera's Portrait mode or nothing at all (this blur is accurate, though). There's no text chat and no breakout rooms, while the maximum number of group call participants (32) is lower than every app other than Discord. We repeatedly had issues connecting to group calls, and while Windows and Android users can join FaceTime calls, they can't start their own.

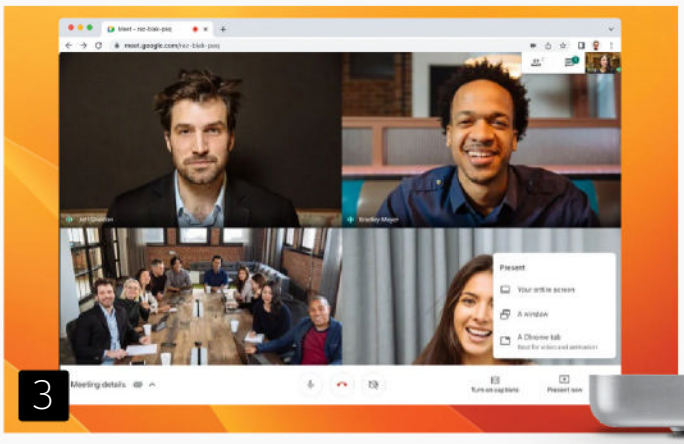
FaceTime is a good option for no-frills, unlimited video calls. But if you want a more comprehensive app, you're better off looking elsewhere.

VERDICT

- ⊕ Free, unlimited call time
- ⊕ Extras like SharePlay
- ⊖ No text chat
- ⊖ Issues with group calls

★★★☆☆

› Image credit: Discord, Apple Inc



Google Meet

› **Free** (offers IAPs) › **FROM** meet.google.com

3 **Google Meet is the only option here that doesn't have its own app, instead running entirely in a web browser window.** Yet don't write it off too quickly – it's a really strong contender.

It's one of the easiest options to get started with, and beginning a call or meeting is extremely fast and straightforward. The video quality is excellent right off the bat, and it's the only app here that offers two levels of background blur. We also appreciated its screen-sharing setup, which shows both your shared content and your webcam's output so you can monitor both.

It may be a browser-only app, but unfortunately its background blurs and effects won't work in Safari (you'll need a Chromium-based browser). Its iOS app is also a disappointingly bare-bones affair. And, while its interface is clean and intuitive, Zoom's interface requires fewer clicks to adjust common settings. Still, Google Meet is a great option, especially if you don't want another app to install.

VERDICT

- ⊕ **Terrific video quality**
- ⊕ **Very easy to use**
- ⊖ **Requires Chromium**
- ⊖ **Interface outdone by Zoom**

★★★★☆

Microsoft Teams

› **Free** (offers IAPs) › **FROM** microsoft.com

4 **On the face of it, Teams should be a pretty good video-calling app.** After all, it's primarily made for business use, and if there's one thing business leaders love, it's a video conference. Yet in practice, it falls far short of what you would hope for.

Call quality is fine, and we like how video-calling features are well integrated into the app's chatrooms, making it easy to start a call with a group of friends or colleagues. Inviting other people into a call is also comprehensively done, with email invites and a built-in calendar integrated into the app. And it offers call transcription and screen sharing features.

Yet the whole thing has an edge of the old familiar Microsoft glitchiness. The app is slow and cumbersome (as is the iOS app), and often had to be restarted when it didn't open (or close) correctly for us. Using the app never really feels fun or smooth – and is frequently frustrating – condemning Teams to a pretty lowly finish.

VERDICT

- ⊕ **Works well with team chat**
- ⊕ **High number of callers**
- ⊖ **Slow and buggy experience**
- ⊖ **Excessive background blur**

★★☆☆☆

› Image credit: Apple Inc, Google Inc, Microsoft

Skype

› **Free** (offers IAPs) › **FROM** skype.com

5 **Skype feels a little like the younger, more playful sibling of Teams (which is ironic, since Skype has been around longer).** Despite both being made by Microsoft, the differences are obvious, with Skype being much more focused on casual calls than Teams' buttoned-down approach.

That's manifested in a bubblier, more crowded app home screen, and that can be distracting. That said, the app feels more pleasant than Teams, and useful controls are easier to find. Interestingly, Skype's background blur is actually a little softer than the one you get in Teams. Its max call length of four hours is generous (but beaten by Discord and FaceTime), and you can call and text mobile numbers from the app (if you have enough credit).

Sharing a video call via email could be easier, and we're not fond of how text chat overlaps the video window, obscuring anyone underneath it. It's a decent enough app overall, but won't win awards.

VERDICT

- ⊕ Simple interface
- ⊕ Decent max call length
- ⊖ Screen-share content obscured during calls
- ⊖ Cluttered home screen

★★★☆☆

Zoom

› **Free** (offers IAPs) › **FROM** zoom.us

6 **Zoom is one of the most popular video-calling apps in the world, and with good reason.** It's full of helpful features, including call recording, chatrooms, emojis and reactions, and whiteboards that let you draw for an audience. There are tons of apps that can be integrated into Zoom, and you can easily adjust common settings and tools at the bottom of the screen. The mobile app is full of features yet is still (mostly) uncluttered.

Video quality starts out a little poor, but resolution and crispness improve immensely once you enable the HD option in video settings. You can blur your background, but like many apps here, the blurred edges are not the most accurate. There are, however, plenty of free backgrounds and effects. Sharing a meeting with others is quick and easy, and there are handy mail and calendar integrations.

Aside from its wealth of features and the fact it's such a comprehensive app, it's just plain satisfying to use. That speaks volumes.

VERDICT

- ⊕ Good video quality
- ⊕ Tons of great features
- ⊕ Very easy to use
- ⊖ Poor initial video res

★★★★★

› Image credit: Microsoft, Zoom Video Communications Inc

THE WINNER

Zoom

Fast, feature-packed and easy to use

Mac FORMAT BEST ON TEST

Microsoft Teams offers a lot of tools, but its laggy, buggy experience makes it too vexing to recommend.

Microsoft sibling Skype is fun and light-hearted, but its cluttered interface and lack of killer features puts it out of the running here.

Despite FaceTime's totally free offering, it's just too fiddly to start calls, with groups or one-on-one. Meanwhile, we're torn when it comes to Discord. We love its unlimited call length and support for multiple chatrooms, but its lack of common video-calling features like calendar invites and end-to-end encryption limits its utility.

Google Meet and Zoom are the last apps standing. Google Meet combines ease of use with great quality, but its web browser-based model feels a little clunky and restrictive.

That leaves Zoom, which is both incredibly simple to use and packs in a huge array of features for free. Its short maximum free call length is a little disappointing, but we can overlook it considering how many other features are included. For video calls, it has the most on offer.

How do they compare?

Specs	Discord	FaceTime	Google Meet	Microsoft Teams	Skype	Zoom
Website	discord.com	apple.com/uk	meet.google.com	microsoft.com	skype.com	zoom.us
Price	Free (offers IAPs)	Free	Free (offers IAPs)	Free (offers IAPs)	Free (offers IAPs)	Free (offers IAPs)
Maximum call participants (free)	25	32	100	100	100	100
Maximum call length (free)	Unlimited	Unlimited	60 minutes	60 minutes	Four hours	40 minutes
Chatrooms/ team chat?	Yes	No	No	Yes	Yes	Yes
Break-out rooms?	Yes (sort of)	No	Yes (paid)	Yes	No	Yes
End-to-end encryption?	No	Yes (on by default)	Yes (on by default)	Yes (opt in, one-on-one only)	Yes (opt in, one-on-one only)	Yes (opt in)
Recording?	No	No	Yes (paid)	Yes (paid)	Yes	Yes
Screen sharing	Yes	Yes	Yes	Yes	Yes	Yes
Polls/Q&As?	Yes (limited polls)	No	Yes (paid)	No	No	Yes (paid)
Transcription/ captions?	No	Yes (Live Captions)	Yes	Yes	Yes (captions only)	Yes
Extras	Game streaming, moderation tools	Memoji, SharePlay	Google Docs integration, whiteboards	Microsoft Office integration, whiteboards	Call cell numbers, emoji reactions, news feed	Whiteboards, recurring calls
Overall	★★★★½	★★★½☆	★★★★½	★★☆☆☆	★★★½☆	★★★★★

Note: The final verdict scores reflect the overall opinion of a product and are not necessarily an average of the criteria listed in the table.

Image credit: Discord, Apple Inc, Google Inc, Microsoft, Zoom Video Communications Inc

Logic Pro for iPad

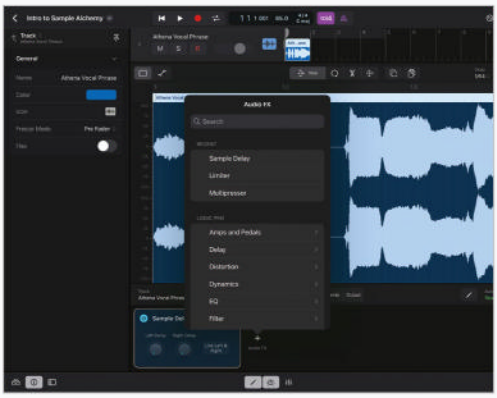
Pro-level music tools come to iPad

› £4.99/month, £49/year (one-month free trial) › FROM apple.com/uk
› NEEDS iPadOS 16.4 or later (device with A12 Bionic chip or later)

Many of Logic's classic software instruments and effects plug-ins have been carried over

Apple has been trying to convince us for a number of years that an iPad can replace a Mac for professional creative work and, in a handful of cases, like art and graphics that's arguably been true. For music production, however, serious Digital Audio Workstations (DAWs) haven't made the leap to iPad, with the notable exception of Steinberg's Cubasis. Perhaps in an effort to remedy this, Apple has created Logic Pro for iPad. Light years more powerful than GarageBand, it's also not a direct port of Logic Pro for Mac. Instead, Apple has created a supremely powerful new app that will be familiar to existing users but is completely reworked for the touch interface.

Unlike Final Cut Pro for iPad with its exacting graphics requirements, Logic Pro works on any iPad with an A12 Bionic processor or better, which includes all recent models. This, combined with its one-month free trial, means a great many people will be able to try it out for themselves. While the app is around 700MB, a full install of all its loops and content weighs more like 15GB which, when combined with space for recordings, could be an issue for



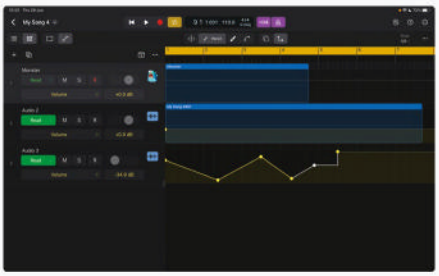
A good selection of instruments and effects in included.

iPads with lower capacities. We tested on an M1-powered iPad along with an A12 version and, while performance on the M1 iPad was buttery smooth, it was slower but still acceptable on the older model.

This is a remarkably accomplished music production suite and one that perhaps only Apple with its vast resources could have pulled off. As such it's possibly a little daunting for newcomers, but a number of excellent tutorials and walkthroughs are provided to get you up and running. There are several track types

APP TIPS

Getting the best out of Logic Pro

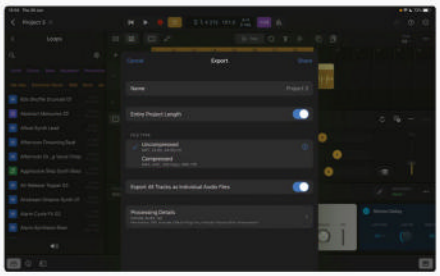


Automate volume and pan

Logic lets you use your finger or an Apple Pencil to enter automation curves to change volume, panning, filters and many other parameters over time for a more interesting and dynamic mix.

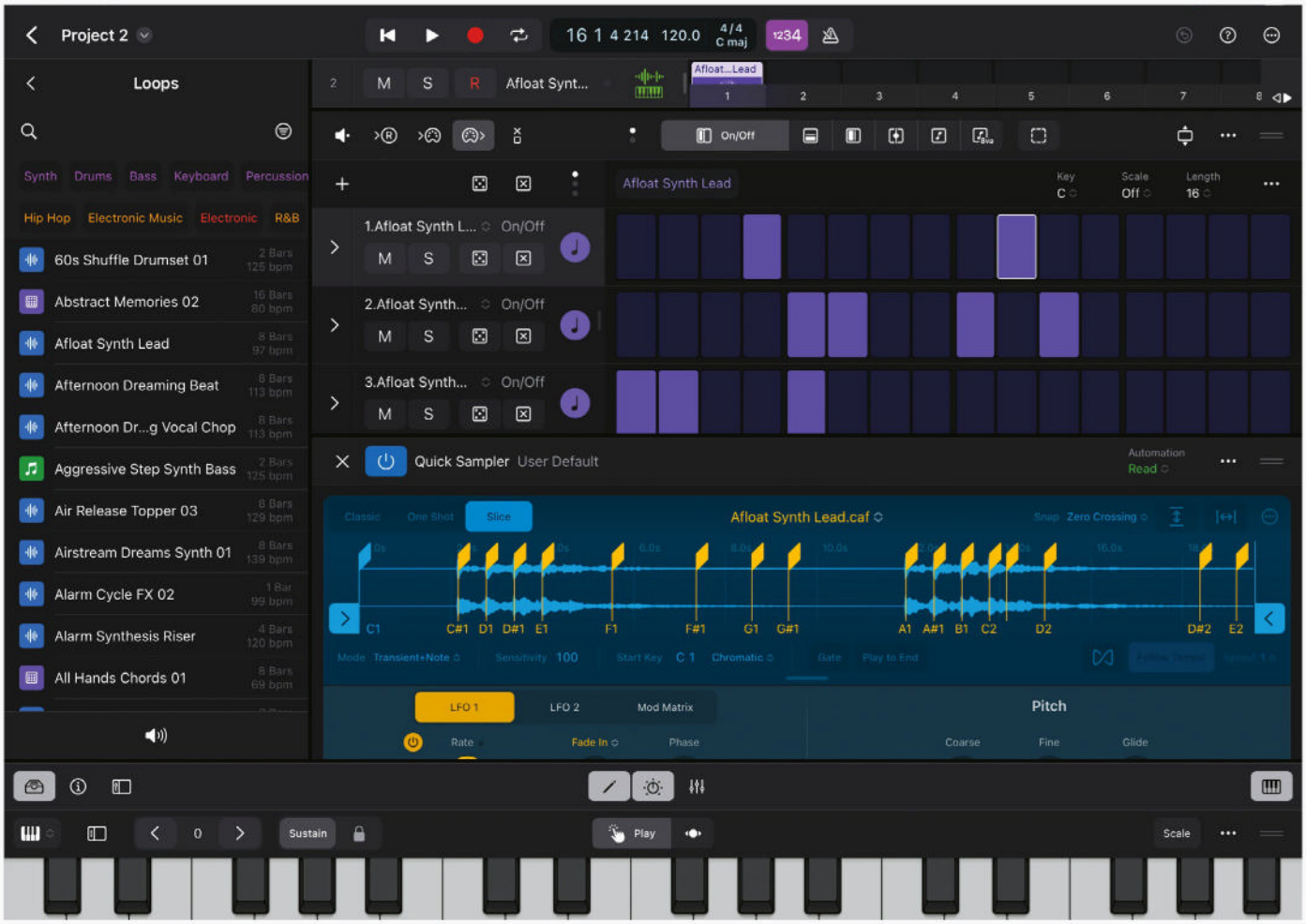
Play your way

There are multiple touch-based ways to play including a keyboard, drum pads and chord pads. These can be further configured to behave the way you want, adding real-time controls like sustain.



Export for mixing

While you can mix on the iPad, it's also possible to move to Logic on Mac, or export each track separately to mix on a different system entirely. This gives you plenty of options for finishing a project.



available – MIDI and pattern-based software instruments, audio and drummer tracks. The content library lets you preview patches, loops and samples and drag and drop these into your project. For each track type, advanced, desktop-class editing tools are available and these extend to beat-stretching audio, generating MIDI patterns and much more. Extensive Apple Pencil support makes tasks like drawing automation curves a breeze.

Customisable interface

Many of Logic's classic software instruments and effects plug-ins have been carried over and are available to load into projects. Audio Unit plug-ins for iOS are supported but these are not nearly as commonplace as they are on the desktop. So while you can transfer projects between iPad and Mac via iCloud or the share sheet, any Mac plug-ins will need to be bounced down to audio before they can go over to the iPad. Hopefully the release of this app will encourage developers to up their game when it comes to iOS audio plug-ins.

Logic's design is superb, doing away with windows in favour of a highly customisable interface that encompasses plug-in chains, a powerful mixer, arranger section, audio and MIDI editors and much more. You really can record, program, edit and mix whole projects in it, to a highly professional standard. You'll want to add an iOS-compatible audio interface for proper recording and monitoring and maybe a MIDI keyboard too, but the same is true of a laptop.

This is by some distance the most powerful and well-designed music app for iPad ever made. There's the odd niggle – iPadOS still limits you in a way macOS doesn't – and beginners will take a little time to come up to speed. And the subscription model will have its detractors too, it doesn't feel like something a company as rich as Apple really needed to do. But Logic Pro for iPad really does justify the 'pro' label, a slick and powerful app that will complement or even for some users replace the desktop version. **Hollin Jones**

The touch interface is especially good for working with loops and MIDI patterns.

The interface lets you show and hide multiple elements easily.

Mac FORMAT ★★★★★ EDITOR'S CHOICE

Mac FORMAT

VERDICT

A hugely accomplished music production app for iPad that deserves the Pro label.

★★★★★

- ⊕ Very powerful tools
- ⊕ Superb touch-centric design
- ⊕ Excellent content included
- ⊖ Subscription model

› Image credit: Apple Inc

Sid Meier's Railroads!

You won't need a ticket for this ride

› £11.99 › FROM feralinteractive.com › NEEDS iPadOS 15.5 or later

Constant increases in your wealth thanks to trains shuttling back and forth

From 2006 comes an iOS port of yet another classic PC game, this time a railway tycoon sim in which you plot steam-based financial dominance with not a care for the huge amounts of industrial pollution you're inflicting on the world.

And while it's possible to play your way through various careers and scenarios, a better fit for mobile is the Train Table mode, in which you're set loose on the landscape with no goals, infinite cash, and may find yourself reaching for an engine driver's cap.

The actual game, in which you play against up to 20 would-be railroad barons, isn't exactly stressful, however. The process of linking resources such as farms with cities and trying to do so as efficiently as possible is an optimisation problem which, mixed with lovely countryside and the gentle chuff of the locomotive, can actually be quite relaxing. You'll still swear – often at yourself for failing to foresee right back at the start of the game the precise situation you find yourself in now, trying to splice new tracks onto an existing network that doesn't go in quite the right direction – but the constant increases in your wealth thanks to trains shuttling back and forth between locations makes up for it.

Charming little animations bring the world to life.

Display all your routes to easily see the extent of your network.

When the line comes to life

Once you've got your rail backbone laid out – less like a spine, more like the webs produced by spiders who've been given LSD – the map comes to life, and you're able to put down branch lines to connect nodes you'd overlooked in the first pass, as well as improving cities by building new industries in them. There's the ability to buy and sell stocks too, hoping to keep your opponents down by denying them the ability to make a quick buck, or giving your own finances a sudden boost.

Keep your trains chuffing along nicely

Tap with precision

One of the fiddliest things about the game is adding new track. It does a good job of pathfinding, but you'll find yourself unable to tap the end of existing track if there's something else in the way. An Apple Pencil can help.

Plan ahead

There's a 'parallel track' button if you want to plan ahead and make sure your most important trains can pass through a busy area unimpeded. A congestion report will tell you the average wait times for your locos.

Pick a character

There are many characters to play as, all of whom made some contribution to the history of the railways, but they have no impact on the gameplay. Want to be Czar Nicholas II in the midwest USA? Go right ahead.

Maps include parts of Europe and the US, and there are 16 scenarios to pit your planning abilities against. None of them are especially challenging, though it's possible to increase the difficulty by introducing rules, like only one train being allowed in any given spot, that increase the realism too.

Working through the different scenarios becomes a matter of having enough time, rather than attempting to untie a clue with your mind. The interface has been greatly changed in the port, the new touch-friendly way of doing things streamlining the process of laying track and finding information, although the size of your digits may impact whether you find the process easier than using a mouse.

Placing track means a simple tap and drag with the finger.

Time moves on and so does the Industrial Revolution, opening up new engines to use on your tracks, new methods of powering them, and patents you can take out to give your trains an edge against the competition.

Romance and ratio

In fact, it's all enough to make you wonder why playing with trains gets such a bad rep in our always-online, instant gratification world. Would seeing a network you've meticulously planned out working at peak efficiency feel the same if you were working with space freighters or data packets instead of something as romantic as a steam engine? It might, as the popularity of games such as Opus Magnum and Satisfactory show, but there is something undeniable about steam trains that means a shed at the bottom of the garden and a thorough understanding of the 1:43.5 ratio surely beckons.

Until then, being able to develop a world-beating rail system on iPad (or on the smaller screen iPhone) is the next best thing, and Railroads! is capable of eating away at many an afternoon when you're supposed to be working, even if the actual challenge is outweighed by the simple satisfaction of watching the engines steaming around.

Ian Evenden

As your cities expand, you'll see new industries added to them.

Mac FORMAT

VERDICT

Clear your timetable: catching this classic railway sim is a day trip to some relaxing gaming.

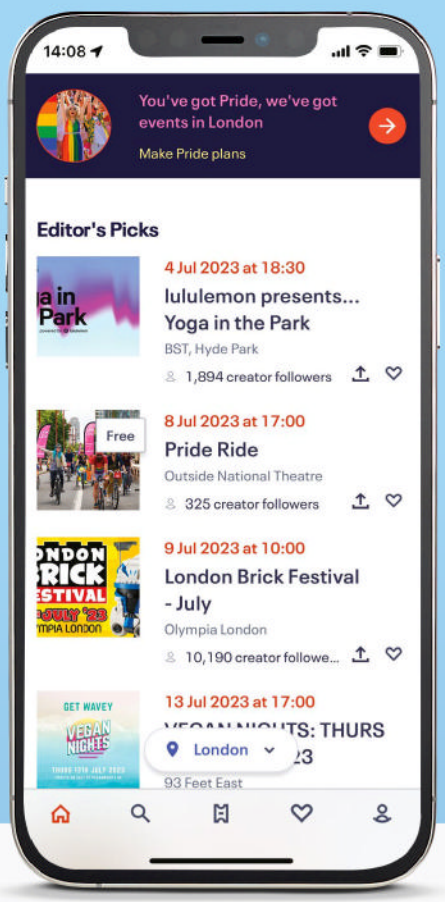
★★★☆☆

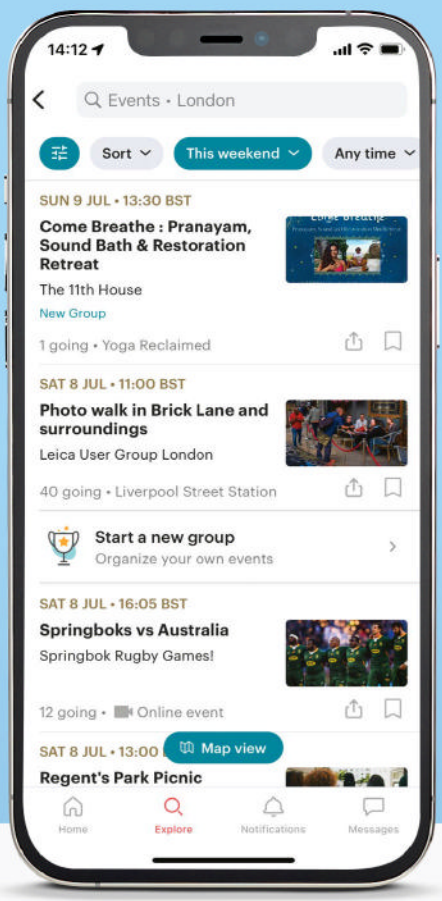
- ⊕ Good touchscreen conversion
- ⊕ Relaxing to play
- ⊖ Not especially deep
- ⊖ No multiplayer

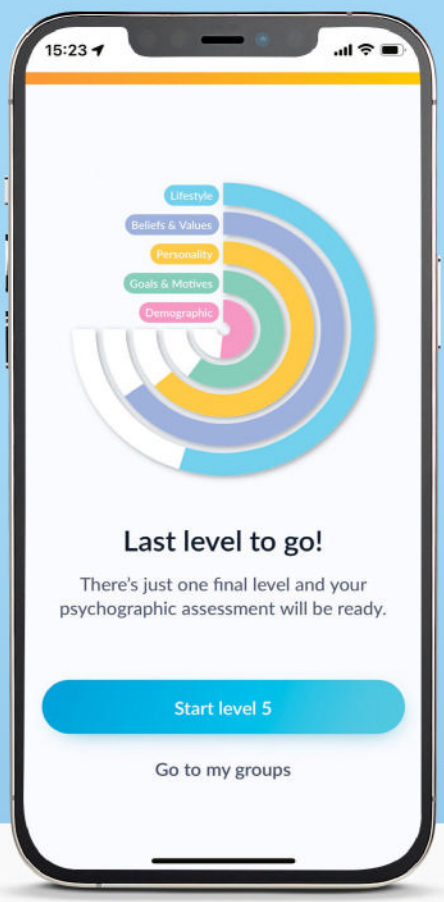
› Image credit: Feral Interactive Ltd

6 apps... for finding great new activities

Try something new in your local area







Eventbrite

› **Free** › **FROM** eventbrite.com
› iOS 15 or later

If you're looking for local activities, Eventbrite is the perfect place to start. It's packed with things to do, from gigs and festivals to classes and conferences. You can buy tickets in the app, and many of the events are free. And if you connect to your contacts, you can find the events your friends are going to and tag along with them. With tons of registered users and a huge variety of listings to browse, it's the best way to get out and about in your area.

Meetup: Social Events & Groups

› **Free** (IAPs) › **FROM** meetup.com
› iOS 15 or later

While Eventbrite is focused mainly on events, Meetup combines activities with the opportunity to meet new people. If you want to expand your social circle and have fun while doing it, this app will be right up your street. With millions of members, there's always a group waiting for you to join, whether you're looking to find a fresh hobby, see the sights of a new city, make more professional contacts, or make new friends.

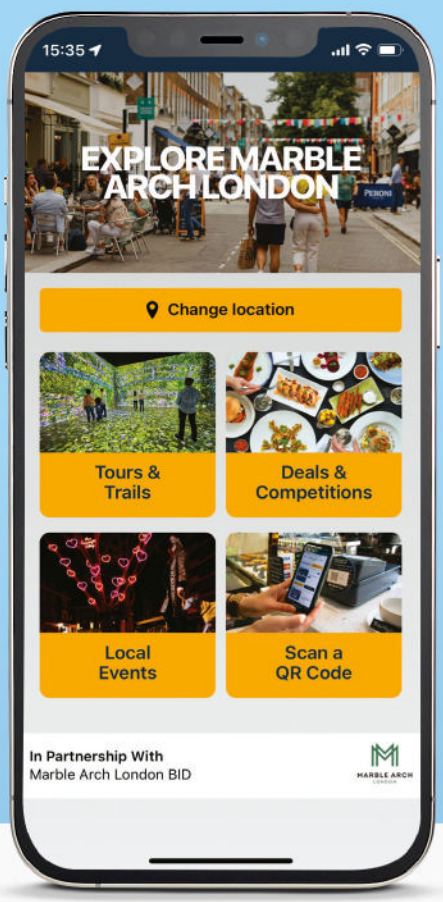
We3: Meet New People in Groups

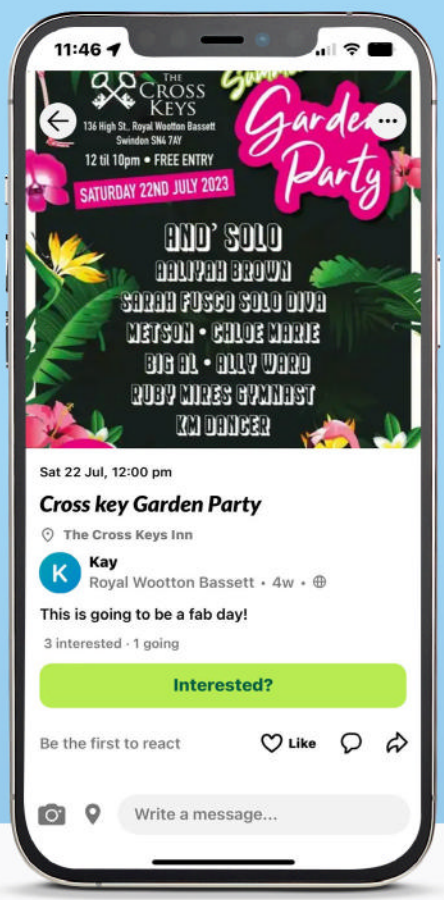
› **Free** › **FROM** we3app.com
› iOS 11 or later

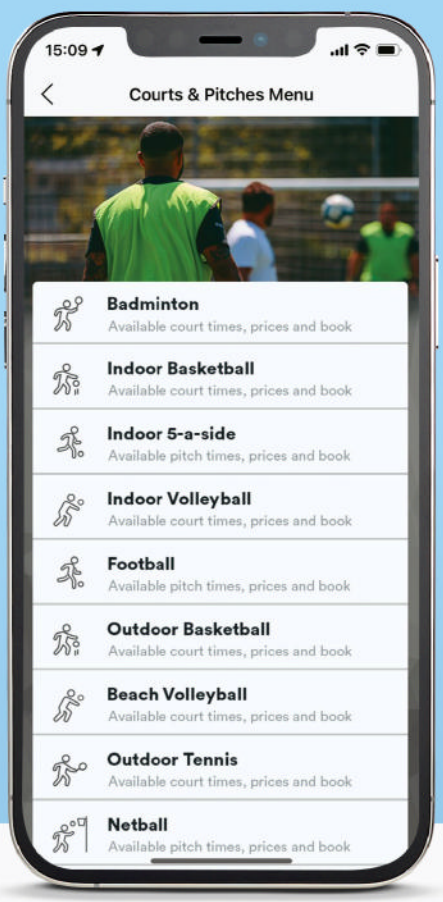
We3 believes that meeting people is better when it's done in groups of three. The thought is there will be fewer awkward moments and mismatched meetups, yet the group will be small enough that everyone can get to know each other. Once you've found a group of people, you can chat, hang out and explore your local area, and make new friends while doing it. It's a great balance of small-scale familiarity and larger group enjoyment.

› **Image credits:** Eventbrite, Meetup, We3, Meet People Inc

It's fair to say that some people can live in an area for a long time and never really know what – or who – is on their doorstep. Fortunately, a fair few app developers think that's a bit of a shame. And, in response, have created apps that make it easier to mingle with fellow human beings in your vicinity. With these apps, you can get together for some stimulating chat, book up for a new hobby, get involved in a sport you've never tried, or find the best deals at your nearby shops, and more. **Alex Blake**







LoyalFree

› **Free** › **FROM** loyalfree.co.uk
› iOS 11 or later

What if you could shop locally and get rewarded for doing it? That's what you get with LoyalFree, which nabs you exclusive deals and savings when you explore what your local area has to offer. It lets you collect loyalty points too, and you can enter competitions to win prizes. It lists pubs, restaurants, exercise classes, shops, and more, all with plenty of filters so you can narrow down your results to find what you want. Exploring your neighbourhood has never been so rewarding.

Nextdoor – Neighbour App

› **Free** › **FROM** nextdoor.co.uk
› iOS 15 or later

One of the best ways to find out what's going on in your neighbourhood is through the Nextdoor app. It can let you know about all sorts of interesting events within easy reach, and help you get to know people who live near you. You can also find recommendations for local shops and restaurants, buy and sell second-hand goods, and get a pet minder while you're away. It's great for staying up to date on all the goings on in your area.

Everyone Active

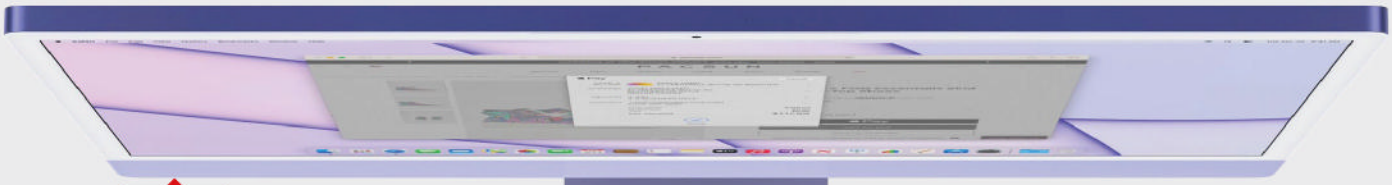
› **Free** (IAPs) › **FROM** everyoneactive.com
› iOS 12 or later

Want to get fit and healthy but don't know where to start? Try Everyone Active. It helps you discover local sports clubs, teams looking for members, and exciting new activities that you might not have tried before. If you're a member of a sports club already, you can catch news, schedules and updates, book appointments and classes, get offers and money off, and much more. It all syncs with your Apple Watch and the Apple Health app too, so you'll be able to keep up with your latest stats.

› Image credits: LoyalFree Ltd, Nextdoor Inc, Innovatise GmbH

STORE GUIDE

Your guide to the best Apple hardware and third-party accessories



EXPECTED NOV 2023
UPDATED APR 2021

Mid-range and top-tier iMacs comes with a Magic Keyboard with Touch ID. The entry-level has a standard Magic Keyboard.

iMac

› From £1,399

› Ever since the Bondi Blue iMac debuted in 1998, Apple's all-in-one desktop computer has been setting standards for design and performance.

The current 24in model is certainly Apple's finest yet – thanks to its 4.5K (4480x2520) Retina display and the Apple-designed M1 chip, which is available with either an 8-core CPU/7-core GPU at the entry-level, or an 8-core CPU/8-core GPU on the mid-range and top-tier versions. All models come with 8GB of memory as standard (upgradeable to 16GB), with solid-state drive (SSD) storage ranging from 256GB on the entry-level and mid-range versions to 512GB on the top tier, although you can add more – up to 1TB on the entry-level and up to 2TB on the mid-range and top-tier models if you wish via Apple's build-to-order options.

Available in a choice of seven gorgeous colours (Green, Yellow, Orange, Pink, Purple, Blue and Silver), each M1 iMac also comes with a 1080p FaceTime camera, a six-speaker sound system and support for Spatial Audio. You'll also find two Thunderbolt/USB 4 ports on each model, with mid-range and top-tier options gaining two additional USB 3 (USB-C) ports. Prices start at £1,399.

iMac 24inch £1,399
(Entry level)

Display: 23.5in 4.5K Retina (4480x2520) with True Tone
Chip: Apple M1 with 8-core CPU (4 performance cores, 4 efficiency cores), 7-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 16GB)
Storage: 256GB (upgradeable to 512GB or 1TB)
Ports: 2x Thunderbolt/USB 4, 1x Gb Ethernet (option)

iMac 24inch £1,599
(Mid-range)

Display: 23.5in 4.5K Retina (4480x2520) with True Tone
Chip: Apple M1 with 8-core CPU (4 performance cores, 4 efficiency cores), 8-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 16GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 2x USB 3, 1x Gb Ethernet

iMac 24inch £1,799
(Ultimate)

Display: 23.5in 4.5K Retina (4480x2520) with True Tone
Chip: Apple M1 with 8-core CPU (4 performance cores, 4 efficiency cores), 8-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 16GB)
Storage: 512GB (upgradeable to 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 2x USB 3, 1x Gb Ethernet

Apple Magic Keyboard with Touch ID and Numeric Keypad

› From £179

› This extended keyboard is a great upgrade option for any Mac and comes with Touch ID for faster Mac logins. The black version costs £199.

Apple Magic Mouse

› From £79

› Design quirks aside, (we're looking at you, Lightning Port) the Magic Mouse is a great pointing device, thanks to its Multi Touch support. The black version costs £99.

Apple Magic Trackpad

› From £129

› This Multi Touch glass trackpad is a thing of beauty, giving you lots of control over macOS and it's rechargeable too. The black version costs £149.

› Image credit: Apple Inc

EXPECTED JUNE 2024
UPDATED JUNE 2023

MacBook Air

From £999

Released in June 2023, the new 15-inch MacBook Air actually has a 15.3-inch Liquid Retina display. The laptop boasts a silent, fanless design, an all-new six-speaker sound system (the 13in has a four-speaker set-up), and immersive Spatial Audio. As per the 2022 Air update, the 15in model also comes with an M2 chip. The M2 features an 8-core CPU, offering 18% faster performance than the previous M1, along with a 10-core GPU, giving a 35% boost in graphics performance. The M2 also has up to 50% more memory bandwidth than the M1. Both M2 MacBook Air models come with 8GB of memory as standard, configurable to 16 or 24GB.

According to Apple, the new 15in Air is the thinnest 15in laptop available – 40% thinner than comparable PC laptops; it's just 11.5mm thin and weighs 1.51kg. The 13in Air is 11.3mm thin and weighs 1.24kg. The Liquid Retina display in the 15in MacBook Air has a resolution of 2880x1864 pixels, while the 13in has 2560x1664. Both support up to one billion colours.

Both the M2 MacBook Air models come with 1080p FaceTime HD cameras, MagSafe 3, two Thunderbolt/USB 4 ports and a headphone jack as well as Wi-Fi 6 and Bluetooth 5.3. You also get up to 18 hours of battery life when viewing video or 15 when web surfing.

Prices for the M2 13in Air start at £1,149, while the 15in model options start at £1,399. (The M1 MacBook Air is also still available from £999.)

MacBook Air £1,149
(Mid-range)

Display: 13.6in Liquid Retina with True Tone
Chip: Apple M2 with 8-core CPU (4 performance cores, 4 efficiency cores), 8-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 3.5mm headphone jack

MacBook Air £1,399
(Ultimate)

Display: 15.3in Liquid Retina with True Tone
Chip: Apple M2 with 8-core CPU (4 performance cores, 4 efficiency cores), 10-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 3.5mm headphone jack

EXPECTED JAN 2024
UPDATED JAN 2023

Mac mini

From £649

Apple's most affordable desktop may not come with a mouse, a trackpad or keyboard, but it's also great value starting at even less than the last model at £649.

Despite the reduction in price, the Mac mini now boasts Apple's M2 chip, boasting an 8-core CPU, 10-core GPU and 16-core Neural Engine. The 8GB of memory can now be boosted up to 24GB, while SSD storage options range from 256GB all the way up to 2TB. There is now also an M2 Pro version with a 10-core CPU/16-core GPU (configurable to 12-core CPU/19-core GPU), with 16 to 32GB memory and 512GB to 8TB SSD storage.

Entry-level and mid-range M2 Mac mini models continue to come with two Thunderbolt/USB 4 ports, but the M2 Pro model has now has four.

Mac mini £649
(Entry level)

Chip: Apple M2, 8-core CPU (4 performance cores, 4 efficiency cores), 10-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 2x USB-A, 1x HDMI 2.0, 3.5mm headphone jack, Gb Ethernet (10Gb Ethernet option)

Mac mini £1,399
(Ultimate)

Chip: Apple M2 Pro with 10-core CPU (4 performance cores, 4 efficiency cores), 16-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 16GB)
Storage: 512GB (upgradeable to 1TB or 2TB)
Ports: 4x Thunderbolt/USB 4, 2x USB-A, 1x HDMI 2.0, 3.5mm headphone jack, Gb Ethernet (10Gb Ethernet option)

TV 4K

From £149

Apple's third-gen little black box with A15 Bionic chip now adds HDR10+ to the mix. Prices now start at just £149 (Wi-Fi only); the standard version now comes with 64GB of storage, while paying £20 extra gets you 128GB and Ethernet support.

Apple HomePod/ HomePod mini

£99/£299

Apple's Siri-powered speakers sound great, you can link two for stereo sound, and use them as smart home hubs. The mini comes in five colours; the 2nd-gen Midnight/White HomePod (£299), offers higher spec and spatial audio.

Watch Series SE, 8 and Ultra

From £259

The 8 and SE are water resistant to 50m, but the new titanium Ultra is water resistant to 100m. The 8 and the Ultra boast an always-on display, and all three offer Emergency SOS and Crash Detection.

MacBook Pro

› From £1,349

EXPECTED JAN 2024
UPDATED JAN 2023

› **While the MacBook Pro 13-inch got the M2 treatment back in June 2022, January 2023 sees the introduction of the M2 Max or M2 Pro in the 14in and 16in models.** The new 14-inch M2 Pro model is available in a variety of CPU/GPU flavours – 10-core CPU/16-core GPU, 12-core CPU/19-core GPU, with 16 or 32GB memory options. Alternatively, if you step up to the M2 Max option, you can go for a 12-core CPU/30-core GPU or 12-core CPU/38-core GPU, with 32 or 64GB unified memory. All range from 512GB SSD storage to 8TB SSD storage. The 16in offers an M2 Pro 12-core CPU/19-core GPU, with 16 or 32GB memory. The M2 Max comes in either 12-core CPU/30-core GPU, with 32 or 64GB memory flavour or 12-core/28-core GPU, with 32 to 96GB memory. Again, all range from 512GB to 8TB SSD storage.

MacBook Pro 13in £1,349
(Entry level)

Display: 13.3in Retina (2560x1600) with True Tone
Chip: Apple M2 with 8-core CPU (4 performance cores, 4 efficiency cores), 10-core GPU, 16-core Neural Engine
Memory: 8GB (upgradeable to 24GB)
Storage: 256GB (upgradeable to 512GB, 1TB or 2TB)
Ports: 2x Thunderbolt/USB 4, 3.5mm headphone jack

MacBook Pro 14in £2,149
(Mid-range)

Display: 14.2in Liquid Retina (3024x1964) with True Tone
Chip: Apple M2 Pro with 10-core CPU (6 performance cores, 4 efficiency cores), 16-core GPU, 16-core Neural Engine
Memory: 16GB (upgradeable to 32GB)
Storage: 512GB (upgradeable to 1TB, 2TB, 4TB or 8TB)
Ports: 3x Thunderbolt/USB 4, HDMI port, SDXC card slot

MacBook Pro 16in £3,749
(Ultimate)

Display: 16.2in Liquid Retina (3456x2234) with True Tone
Chip: Apple M2 Max with 12-core CPU (8 performance cores, 4 efficiency cores), 38-core GPU, 16-core Neural Engine
Memory: 32GB (upgradeable to 96GB)
Storage: 1TB (upgradeable to 2TB, 4TB or 8TB)
Ports: 3x Thunderbolt/USB 4, HDMI port, SDXC card slot

Mac Studio

› From £2,099

EXPECTED JUNE 2024
UPDATED JUNE 2023

The Mac Studio is Apple's most powerful desktop Mac to date – it's pricy though.

› **The Mac Studio finally received a long-hoped-for update in June 2023 with the new model sporting Apple silicon M2 Max and M2 Ultra chips.** The new Mac Studio is up to six times faster than the most powerful Intel-based 27-inch iMac and up to three times faster than the M1 Ultra Studio that preceded it.

The Studio's aluminium body is very compact for a desktop Mac, measuring 197x197x95mm, but it's what's inside that counts. The M2 Max chip has a 12-core CPU, a 30-core GPU (upgradeable to 38-core), and 32GB of memory (configurable to 96GB). The M2 Ultra comes with a 24-core CPU, 60-core GPU (upgradeable to 76-core), and 64GB of unified memory (upgradeable to 192GB). Storage options on both scale up to 8TB.

The Mac Studio M2 Max starts at £2,099, and the M2 Ultra starts at £4,199, so these machines are not for everyone. But both offer an incredible array of connectivity options and support for the more pro user.

Mac Studio £2,099
(Entry level)

Chip: M2 Max with 12-core CPU (8 performance cores, 4 efficiency cores), 30-core GPU, 16-core Neural Engine
Memory: 32GB (upgradeable to 96GB)
Storage: 512GB (upgradeable to 1TB, 2TB, 4TB, 8TB)
Ports: 4x Thunderbolt 4, 2x USB-C, 2x USB-A, HDMI 2.0, 3.5mm headphone jack, 10Gb Ethernet, SDXC card slot

Mac Studio £4,199
(Ultimate)

Chip: M2 Ultra with 24-core CPU (16 performance cores, 8 efficiency cores), 60-core GPU, 32-core Neural Engine
Memory: 64GB (upgradeable to 192GB)
Storage: 1TB (upgradeable to 2TB, 4TB, 8TB)
Ports: 4x Thunderbolt 4, 2x USB-C, 2x USB-A, HDMI 2.0, 3.5mm headphone jack, 10Gb Ethernet, SDXC card slot

Studio Display

› From £1,499

› **Launched alongside the Mac Studio in March 2022, the Studio Display is a great addition to any Mac setup.**

Powered by Apple's A13 Bionic and running iOS, it features a 27-inch Retina display with 5K resolution (5120x2880 pixels) and True Tone, a 12MP Ultra Wide camera with Centre Stage, and a six-speaker sound system with support for Spatial Audio. A range of stand options are available, and you can choose nano-texture glass for £250 more.

› Image credit: Apple Inc

iPad/mini

› iPad (10th gen) From £499
› iPad mini From £569

› **Apple celebrates the iPad's 10th incarnation by increasing the display to 10.9in and boosting its internals to an A14 Bionic chip.** You now get an Ultra Wide 12MP front and updated 12MP back camera. The iPad now also finally adopts the USB-C port, and comes in Blue, Pink, Yellow and Silver. Prices start at £499.

The iPad mini is like a shrunk down iPad Air, with an all-screen design centred around its 8.3in Liquid Retina display. The £569 version comes with 64GB of storage (but can be upgraded to 256GB), comes with a 12MP Wide camera, second-gen Apple Pencil support and USB-C charging.

iPad Air

› From £669

› **Like the iPad, iPad mini and iPad Pro, the iPad Air has an all-screen design that makes the most of its 10.9in Liquid Retina display.** Inside its super-slim chassis, you'll find the same Apple silicon M1 chip as the entry-level MacBook Air and Mac mini. Plus it's available in a choice of storage options (64GB or 256GB), has 802.11ax Wi-Fi (aka Wi-Fi 6) and Bluetooth 5.0 onboard, and there are Wi-Fi+Cellular variants with 5G starting at £719.

The iPad Air also supports Apple's second-gen Apple Pencil and can be teamed with Apple's Magic Keyboard for powerhouse productivity on the go. Augmented reality fans will love its LiDAR-equipped 12MP Wide camera, plus it also has Centre Stage.

iPad Pro

› From £899

› **Apple's priciest iPad is also its most fully featured.** Available in 11in and 12.9in sizes, the iPad Pro models now boast M2 Apple silicon, which turbocharges the performance, and iPadOS 16 enables the new Apple Pencil 'hover experience'.

The 12.9in model's Liquid Retina XDR display boasts miniLED backlighting, but even the 11in model gets 120Hz ProMotion refresh rates, plus a Thunderbolt/USB 4 port for charging and connection to a wide range of external devices. And both support the second-gen Apple Pencil, Magic Keyboard, and Centre Stage. The 12.9in now makes an even greater MacBook replacement.

iPad

Display: 10.9in
Chip: A14 Bionic
Storage: 64GB, 256GB
Ports: USB-C
Unlocking: Touch ID

iPad mini

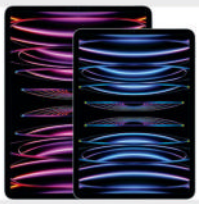
Display: 8.3in
Chip: A15 Bionic
Storage: 64GB, 256GB
Ports: USB-C
Unlocking: Touch ID

iPad Air

Display: 10.9in
Chip: Apple M1
Storage: 64GB, 256GB
Ports: USB-C
Unlocking: Touch ID

iPad Pro

Display: 11in or 12.9in
Chip: Apple M2
Storage: 128GB-2TB
Ports: Thunderbolt 4
Unlocking: Face ID



Apple Smart Folio

› From £69

› Available in a range of stylish colours, these wrap-around magnetic cases will keep your iPad mini, iPad Air and iPad Pro looking good for years, and they double as handy stands.

Apple Pencil

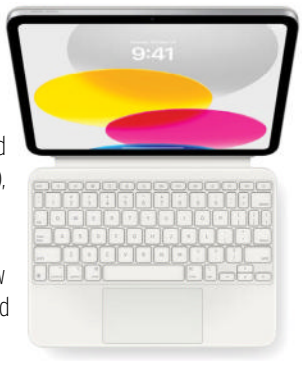
› From £89

› Available in first-gen and second-gen variants, the Pencil brings pinpoint accuracy to your iPad interactions, making it great for sketching, painting and creating handwritten notes. And lots more besides.

Apple Magic Keyboard/Folio

› From £279

› The Magic Keyboard (for iPad Air/iPad Pro), comes with backlit keys and easy-to-use trackpad. There's now also a Magic Keyboard Folio for iPads.



iPhone SE

› From £449

› Apple's most affordable iPhone is now even better value, thanks to a March 2022 update that saw it receive the same A15 Bionic chip as the rest of the iPhone line-up and gain 5G to boot. Old-school design aside, the iPhone SE has most of the things people love about iPhone, from iOS's phenomenal ease of use to a 12MP Wide main camera with 4K recording – perfect for shooting photos and videos.

Battery life is decent too with the iPhone SE lasting for up to 15 hours between recharges (with Qi wireless charging onboard too). The main thing the iPhone SE misses out on is Face ID unlocking, making do with Touch ID on the Home button instead.

iPhone SE
Display: 4.7in
Chip: A15 Bionic
Storage: 64GB-256GB
Connectivity: 5G, Wi-Fi
Unlocking: Touch ID

iPhone 14/ Plus

› iPhone 14 From £849
› iPhone 14 Plus From £949

› The iPhone 14 retains the 6.1in screen of the 13, although the mini has been discontinued, and there's a 14 Plus with a 6.7in screen.

The two handsets retain the A15 Bionic chip, and the Main, Ultra Wide TrueDepth cameras are still 12MP but the phones now boast a Photonic Engine for better low-light images.

The iPhone 14 lasts up to 20 hours for video playback; the Plus up to 26 hours. All four handsets feature Emergency SOS and Crash Detection – Apple's latest ways of establishing an accident and contacting the emergency services.

iPhone 14
Display: 6.1in
Chip: A15 Bionic
Storage: 128GB-512GB
Connectivity: 5G, Wi-Fi
Unlocking: Face ID

iPhone 14 Plus
Display: 6.7in
Chip: A15 Bionic
Storage: 128GB-512GB
Connectivity: 5G, Wi-Fi
Unlocking: Face ID

iPhone 14 Pro/Pro Max

› iPhone 14 Pro From £1,099
› iPhone 14 Pro Max From £1,199

› The iPhone 14 Pro and Pro Max come with the Dynamic Island, an interactive area around the new TrueDepth camera, that integrates alerts, activities, and notifications.

The Pro 14 and Pro Max are powered by a new A16 Bionic chip, and despite now offering an always-on display, the 14 Pro can last up to 23 hours for video playback, while the 14 Pro Max can keep going for up to 29 hours. Photography gets an upgrade too, as a new quad-pixel sensor on the Main camera provides 48MP quality at 12MP optimisation.

iPhone 14 Pro
Display: 6.1in
Chip: A16 Bionic
Storage: 128GB-1TB
Connectivity: 5G, Wi-Fi
Unlocking: Face ID

iPhone 14 Pro Max
Display: 6.7in
Chip: A16 Bionic
Storage: 128GB-1TB
Connectivity: 5G, Wi-Fi
Unlocking: Face ID

Apple AirTag

› £35

› Ideal for keeping track of keys, bags and other easily mislaid items, AirTag hooks into Apple's Find My network, with precision finding on the iPhone 11 or later, thanks to their built-in U1 chip.

Apple AirPods/ AirPods Pro 2

› From £179

› Third-gen AirPods and second-gen AirPods Pro boast Spatial Audio with dynamic head tracking. The Pro also support ANC and Adaptive Transparency.

Apple AirPods Max

› £549

› These premium headphones aren't for everyone – especially at that eye-watering price tag. They are supremely comfortable and great-sounding though.

› Image credit: Apple Inc

BEST BUYS...

› EXTERNAL DISPLAY

Philips 27B1U7903

£1,099, philips.co.uk

› *An excellent monitor that satisfies on every level. It's expensive, but you do get a lot of quality for your money.*

★★★★★ *MF392*

› BLUETOOTH SPEAKER

Marshall Middleton

£269.99, marshallheadphones.com

› *Meaty, beaty, big and bouncy, the Middleton knows how to rock.*

★★★★★ *MF391*

› NAS DRIVE

Asustor Lockerstor 2 Gen2 AS6702T

£469, asustor.com

› *Excellent and versatile mid-range network storage.*

★★★★★ *MF390*

› OUR TOP 3

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› *asus.com/uk*

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› *anker.com/uk*

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› *uk.ugreen.com*

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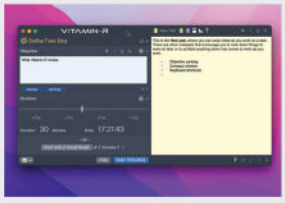

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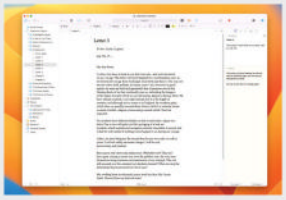

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£8.99 grizzlylabs.com

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★★★★★ *MF368*

› PAGE LAYOUT (iPADOS)

Affinity Publisher 2

£17.99 affinity.serif.com

Serif's page layout app finally arrives on iPad and it's great – even if the interface takes some getting used to.

★★★★★ *MF391*

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£4.99 reederapp.com

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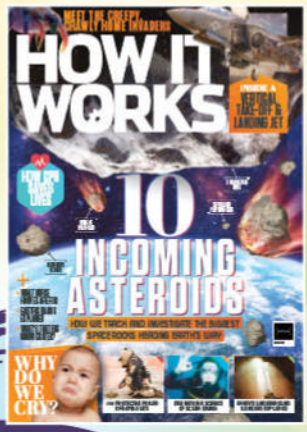

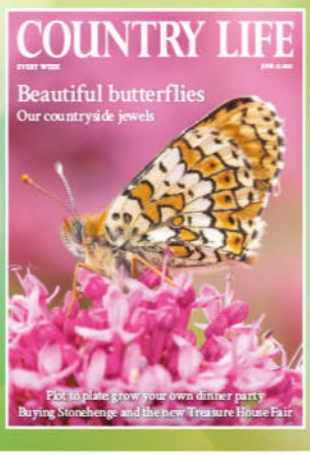

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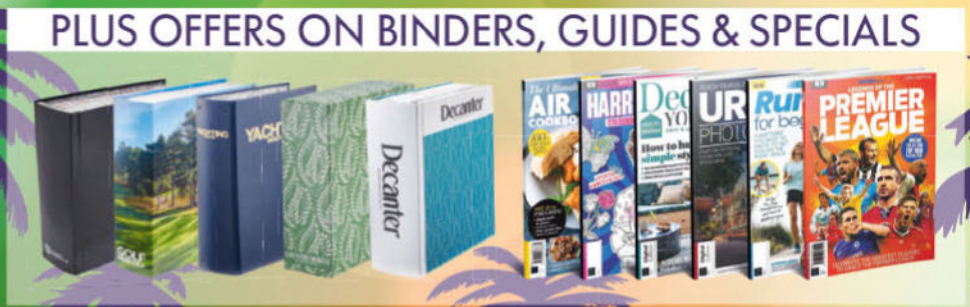

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One more thing
Siri GPT

Graham Barlow can't wait to give normal Siri the heave-ho and get the AI upgrade we've all been waiting for

Could Apple be about to add AI to Siri? Some people seem to think so.

According to Mark Gurman's Power On newsletter this month, Apple is already using an AI chatbot internally to help its teams do their work, and it's going to start moving it into customer-facing products next year. If he's right, then it might not be long before we get an AI-boosted Siri. If you've ever used an AI chatbot, like ChatGPT, for instance, then you'll know it's a lot better than Apple's current virtual assistant, Siri.

There's no other way to say it – right now, Siri sucks. Ask ChatGPT something like 'explain quantum computing in simple terms', and you get an actual answer. Ask Siri and you get a 'I found this on the web' response, which tries to point you in the right direction but is simply handing off the responsibility to somebody else. All it does is show you links to websites that usually point to something related to what you wanted to know, but not the actual thing itself.

Sure, Siri does useful stuff like start timers or schedule reminders, and when it launched in 2011 this was all pretty groundbreaking stuff. The problem is this was more than 10 years ago now and things have moved on. The rise of AI chatbots such as ChatGPT have shown what's really possible with modern man/machine interactions. Suddenly Siri is looking a bit long in the tooth.

Trust issues

Just imagine a Siri that you could have a proper conversation with. You could ask it to write an email to your boss on your behalf about why you need to take next Friday off – and Siri would do a pretty good job. In fact, it could probably email it to your boss for you and get you a raise while it's at it! But, as brilliant as that sounds, AI doesn't come without risks.

AI learns everything it knows by training itself on what it finds on the web, and so it can have a very loose relationship with the truth. In fact, there have been reports of people posting fake news just to get AI chatbots to report it as fact. AI is really bad at 'hallucinating' various products into existence when doing round-ups of what the best processor graphics card is, for example. Apple will find all this problematic, and will be looking to use a chatbot that doesn't make these kinds of mistakes, but that's what Apple has always been good at. It takes other people's ideas and makes them better.

Mac FORMAT
NEXT ISSUE ON SALE
19 SEP

Image credit: Apple Inc

IF I HAD SOMEWHERE TO LIVE...

I COULD GO ANYWHERE IN LIFE

When Abi's mum died, life got tough. She didn't get on with her dad and the arguments became violent. Abi felt her only choice was to leave home. With just the clothes on her back, and no idea where to go, she ended up sleeping on the streets in the freezing cold.

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