TAKE FULL CONTROL OF YOUR TV:

TECH life

AUSTRALIA

WINDOWS, MAC, ANDROID & iPHONE HACKS

ISSUE 77 JUNE 2018 | f TECHLIFER ▼ TECHLIFER 🔲 APPLE NEWSSTAND & GOOGLE PLAY

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TAKE YOUR PHONE FROM BUDDING TO BODACIOUS

EXPAND YOUR STORAGE FOR MUSIC, MOVIES & MORE * ACCESSORIES REVIEWED * TIPS & TRICKS * TOUGH CASES & MOUNTS TO PROTECT YOUR PHONE * UNLEASH THE FULL POWER OF ANDROID & iOS

nura

LATEST REVIEWS
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NURAPHONE HEADPHONES
ROOMBA 980 ROBOT VAC

DO MORE WITH YOUR DSLR
SAME SNAPPER, NEW TRICKS! SEE P.104

SAY HELLO TO THE BIG iMAC
HOW MUCH COMPUTING POWER DOES $14K GET YOU?

FUTURE

Vigor2862 Series

DrayTek
Aust & NZ
www.draytek.com.au

NBN SMB Solution for VDSL2 & Ethernet WAN (FTTN/B, FTTP, HFC, Fixed Wireless, Statellite)

VDSL2/ADSL2+ Multi-WAN Gigabit router with dual USB ports for 3G/4G connectivity, VoIP and IEEE 802.11ac Wi-Fi achieving speeds up to 1.7Gbps throughput

Aust / NZ VDSL NBN Ready

Ethernet WAN NBN Ready

Ethernet WAN UFB Ready

32x VPN

Vigor2862Vac

Internet

LAN

VigorSwitch

XYZ Office Building

VLAN Features

- Supports up to 8 LAN IP subnets
- Supports up to 16 VLANs, ie up to 16 logical workgroups
- Additional security and traffic management
- IEEE 802.1q allows multiple VLANs to be connected on a simple LAN connection
- Applications examples:
  Separation of networks for tenants
  Staff in different locations can be grouped as same section

VLAN4 -Company C   LAN4: 192.168.8.x
VLAN3 -Company B   LAN3: 192.168.7.x
VLAN2 -Company A   LAN2: 192.168.6.x
VLAN1 -Landlord   LAN1: 192.168.5.x

LAN >> VLAN Configuration

VLAN Configuration

☑ Enable

	LAN					VLAN Tag		
	P1	P2	P3	P4	Subnet	Enable	VID	Priority
VLAN0	☐	☐	☐	☐	LAN4 ▼	☐	0	0 ▼
VLAN1	☑	☐	☐	☐	LAN1 ▼	☑	10	4 ▼
VLAN2	☐	☑	☐	☐	LAN2 ▼	☑	20	1 ▼
VLAN3	☐	☐	☑	☐	LAN3 ▼	☑	30	2 ▼
VLAN4	☑	☑	☑	☑	LAN4 ▼	☑	40	3 ▼

- VDSL2/ADSL2+, Gigabit Ethernet WAN port, Dual USB ports for failover and load-balancing
- Two USB 2.0 ports for connection to two 3.5G/4G LTE USB mobiles, FTP server and network printer
- 4 x Gigabit LAN ports with multiple subnets and 50,000 NAT sessions
- Integrated IEEE 802.11ac (AC2000) wireless Access Point; dual band; up to 1.7Gbps throughput (ac & Vac model)
- IPv6 & IPv4. Increased IP addresses (1022) and IP subnets (8)
- VoIP (2 x FXS and 1 x FXO Line Port) for Vigor2862Vac
- Object-based SPI Firewall and CSM (Content Security Management) for network security

- High Availability mode
- 16 x VLANs for secure and efficient workgroup management
- 32 x VPN tunnels (including 16 x SSL VPN tunnels)
- Fast VPN throughput, VPN load-balancing and backup for site-to-site applications
- Embedded Central VPN Management for 8 remote Vigor routers
- Central AP Management for deployment of multiple wireless VigorAPs
- Works with Smart Monitor Network Traffic Analyzer
- Works with VigorACS 2 Central Management for multi-site deployment

EDITORIAL

UNFETTERED SPECULATION

HUBER ESTIMATES THAT, GLOBALLY, $20 BILLION OF PREVIOUS METALS ARE WASTED EVERY SINGLE YEAR THANKS TO TECHNOLOGY BEING DUMPED. CLOSER TO HOME, THE UNITED NATIONS UNIVERSITY SAYS THAT AUSTRALIA GENERATED 570,000 TONNES OF E-WASTE IN 2016, AND ONLY 7.5% OF THAT WAS RECYCLED.

[GOLDEN AGE]

Seven billion people and a $20 billion problem

EVERY YEAR, A STAGGERING AMOUNT OF OUTDATED TECH AND THE PRECIOUS METALS WITHIN ARE TOSSED AWAY, SO WHAT IS BEING DONE TO FIND THE TREASURE IN THE TRASH?

[PAUL TAYLOR]

THE CITY OF Albuquerque, New Mexico, is home to what is probably the world's smallest gold mine. Rather than digging for the precious metal, it's instead recycling it from existing technology, specifically by stripping down a part of your mobile phone that you forget about as soon as your handset is turned on: your SIM card.

Gold is an integral part of SIM cards, and the ABC reports that materials chemist Dale Huber and his team at Sandia National Laboratories in Albuquerque are using ultrasound to extract the metal from the SIM. Sandia Labs dunks the SIM in water and directs ultrasonic waves at the card, causing it to bubble and release the precious particles. This method is more environmentally friendly than using mercury to dissolve the gold, as that resultant mix then needs to be boiled in order to extract the gold, and the mercury is then usually lost in the air.

Ingenious, no? Rather than mining the earth for more metal, it's reusing what's already abundantly available, one of those remarkable ways of recycling that a lot of people probably don't know about, like scrunching up aluminium foil into a ball or crimping it inside another aluminium can so that it can be reused. Huber estimates that, globally, $20 billion of precious metals are wasted every single year thanks to technology being dumped. Closer to home, the United Nations University says that Australia generated 570,000 tonnes of e-waste in 2016, and only 7.5% of that was recycled. As a country, we have lofty goals to improve in some areas, as the Australian Government has set a target of recycling 80% of discarded TVs and computers by 2021–22 (up from 17% in 2010–11).

You can do your part to keep metals out of the ground. You can look up one of the 1,800-odd collection points around the country (found on **recyclingnearyou.com.au**) if something is totally dead. As we've pointed out in previous issues of *TechLife*, if the thought of chucking it makes you uneasy, you can sell your 'unwanted but still working' stuff on sites like eBay or Gumtree, or pass it on to friends and family members (just make sure all sensitive data has been wiped or destroyed before you do).

And if you have any other ideas for re-using or recycling old tech, the *TechLife* team would love to hear them, so please do get in touch. ■

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GEAR + GUIDES!

MASTER YOUR MOBILE

TAKE YOUR PHONE FROM BUDDING TO BODACIOUS

EXPAND YOUR STORAGE FOR MUSIC, MOVIES & MORE * ACCESSORIES REVIEWED * **TIPS & TRICKS** * TOUGH CASES & MOUNTS TO PROTECT YOUR PHONE * **UNLEASH THE FULL POWER OF ANDROID & iOS**

[038]
God of War, Far Cry 5, Sea of Thieves, and more games reviewed!

047

048

THIS IS A DEVICE BUILT FOR THOSE WHO DON'T LIKE THE STANDARD FITNESS TRACKER DESIGN AND WANT SOMETHING WITH A LITTLE MORE STYLE.

045

044

046
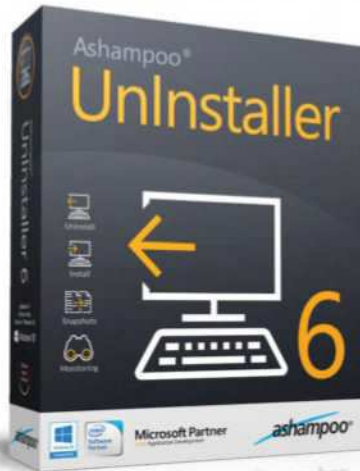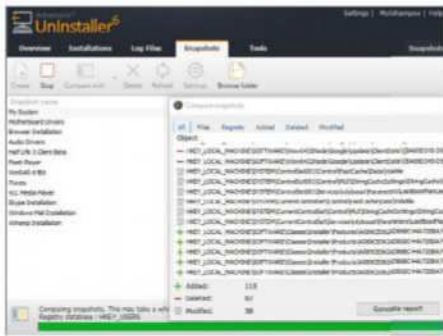
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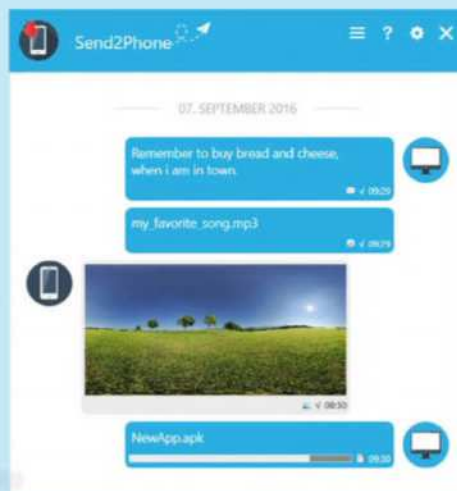
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Easily send yourself links, images or any other files between PC and Android phone — or the other way around. Using the highest security level encryption, AES-256, Send2Phone uses a simple drag-and-drop interface, and supports almost every popular format: Links, text, PDF, MP3 or video formats like WMV, AVI, MOV or MPEG. Send2Phone knows them all and therefore is the perfect companion for your everyday life.
Download link: www.techlife.net/exclusives
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Please note that these exclusive downloads will only be available for a limited time, from 10/05/2018 to 27/06/2018

THE WALL

Extraordinary: the new normal

While on my commute, I generally try to get up to date on all my tech news on my phone — when I don't have a copy of *TechLife* on me, of course! I'm drawn to stories about SpaceX quite often, being both a fan of Elon Musk and also an avid science-fiction reader, and I think the giant leaps the company is taking with regards to landing rockets and how they're recycling them is pretty extraordinary. But this latest article on Teslarati (**www.teslarati.com/spacex-falcon-9-sea-landing-tess-exoplanet**) included this rather stunning first sentence:

SpaceX has successfully completed the first drone ship recovery of a Falcon 9 booster in nearly six months, bringing to an end a what will likely be the final drought of by-sea rocket landings in the company's history.

It's the tone of that sentence that made me think... The author, while obviously an enthusiast of SpaceX as well (judging by the rest of his work), has somehow made it sound as though the company had been lazy for six months only landing their rockets on solid ground! Can we just take a step back for a moment? SpaceX is landing rockets, not letting them disintegrate in the atmosphere or drift off into space with all the other junk. *Landing* them! When did that become so normal? They're the only company doing this! I'm still amazed every time I watch one of those rockets descending, and my skin crawls when the camera pans out to see them standing straight, ready to go again!

While, of course, all of these experiments will lead eventually to what Elon Musk hopes is regular shuttles around the world and a booming Mars colony, can we just slow down to appreciate the still incredible feat of landing a flamin' rocket?!

[JORDAN RASHFORD]

> "SPACEX HAS SUCCESSFULLY COMPLETED THE FIRST DRONE SHIP RECOVERY OF A FALCON 9 BOOSTER IN NEARLY SIX MONTHS, BRINGING TO AN END A WHAT WILL LIKELY BE THE FINAL DROUGHT OF BY-SEA ROCKET LANDINGS IN THE COMPANY'S HISTORY."

Ed replies: The leaps and bounds made by Musk are still a marvel. Without picking apart another publication's meaning too much, we'd think that the drought of unsuccessful landings is bookended by two moments of success. Going six months with no tangible, visceral spectacular to show off to the world would be frustrating. What excites us about Space X's research and achievement is the application and trickle down this affords us five years, a decade or more in the future. Transportation — both on earth and into the inky black — is the most obvious beneficiary, and bringing down the costs for exploration. Tourism, too, as a side benefit, and we've written about space tourism in our news section this month. ■

[NICHE APPEAL]

iMac Pro

EXTREME PRICE, EXTREME POWER.

[MATT BOLTON]

WINNER
TECHlife
APPROVED
AWARD

THE IMAC PRO is a wolf in sheep's clothing — somehow, Apple has packed a workstation with up to an 18-core Xeon processor in a frame the exact size of the regular 5K iMac. The only thing more amazing than the engineering feat of producing it is the price you might pay for one. But this is a truly pro machine, and that kind of power comes at a cost.

Apple provided us with a very high-end unit for our review (described in the specs), but the 'basic' $7,299 model offers an eight-core, 3.2GHz Intel Xeon processor, a less-potent 8GB AMD Vega 56 graphics card, 32GB of memory and a 1TB SSD. It's all hugely configurable — our beefy unit included the 10-core CPU at $1,280 above the basic 8-core model, but you are able to choose a 14-core processor or an 18-core option (at an additional $2,560 and $3,840, respectfully), and while the basic unit comes with 32GB of memory, you can choose 64GB ($1,280) or 128GB ($3,840). As you can see, these custom configs seriously add up.

If you're wondering what the benefits are of spending *thousands* on a hulking super-computer, you can probably already rule out the iMac Pro as being for you, even if you can afford it.

If you're a video editor, you will see big benefits from having multiple cores to render high-res footage and play it back in real time. Programmers compiling code will benefit from big parallel computing output. Extreme Photoshop users will find the giant memory option useful. To make it worthwhile, you probably have to be someone who looks at the price of the iMac Pro, calculates how much time it could save, and then works out whether the two balance out. Either that or a millionaire who just really wants the (admittedly

irresistible) Space Grey finish for their powerful desktop computer.

But the reason this costs so much is that it's using workstation parts like ECC (error-correcting code) memory, which means your huge, vitally important work is less likely to become corrupted and crash apps out, losing you time and money. If you need it, you need it.

POWER PLAY

OK, how fast is it actually to use? Obviously, it's fast. *Really* fast. Everything you do is effectively instant, though that's partly down to the storage, which is comically speedy, just like all Macs with flash storage these days. This is part of what makes it so good for video work. Since this performance isn't unique to the iMac Pro, its speed only really stands out from other Macs once you start processor- or graphics-intensive tasks.

So the next thing we tried was our video export test in HandBrake. In our benchmarks, the Pro showed a huge boost over the regular 5K iMac: this Pro model is three times faster! That's what we mean about the price being worthwhile if it saves you a lot of time.

It's a similar story when it comes to the computer's graphics. The Vega 64 chip in our review unit is AMD's big powerhouse, meant to battle the top-end cards from rival Nvidia, and there's big performance here. In Unigine Heaven benchmarks, it doubles the score of the 5K iMac, which is a good start. But that's not real-world usage. The more important fact is that, if you want to play games in 4K or even 5K, you can. Not always super-smoothly, but games a few years old, like the *Tomb Raider* reboot, can hit 30fps in 5K and 60fps in 4K at higher quality settings. This Mac is also powerful enough for VR

THE SPACE GREY REAR SIDE IS ESPECIALLY DRAMATIC. NOT THAT YOU'LL REALLY GET TO ENJOY IT.

You get a Space Grey mouse, keyboard and trackpad exclusively with iMac Pro.

4

IMAC PRO
From $7,299 ($14,659 configuration tested)
apple.com/au

CRITICAL SPECS:
(As tested)
5,120 x 2,880-pixel 5K Retina display; 3GHz, 10-core Intel Xeon W CPU; 128GB 2,666MHz ECC memory; 2TB SSD storage; AMD Radeon Pro Vega 64 graphics with 16GB of HBM2 memory; 802.11ac Wi-Fi, Bluetooth 4.2; 4x Thunderbolt 3, 4x USB 3 (Type-A), 10Gb Ethernet, SDXC card slot, 3.5mm jack

The Thunderbolt 3 ports look identical to plain USB-C, but they support super-fast 40Gbps transfers and 5K displays.

Apple has accommodated the iMac Pro's more powerful components thanks to a redesigned cooling system.

content creation, which Apple is keen to push, though it's still only just getting started on Macs, really.

One thing that softens the price of the iMac Pro is that it's basically a workstation with a free 5K screen included. A standalone 5,120 x 2,880-pixel, 27-inch display that works over one Thunderbolt 3 cable (such as the LG UltraFine 5K Display promoted on Apple's website) will set you back something like $1,900, so getting it as part of the package here definitely adds to the appeal. That said, it's the same panel you get in the regular 27-inch, non-Pro iMac, so if that's the bit that interests you, you have that cheaper option.

Still, the important thing is that the screen is totally gorgeous. It's bright, the colours are fantastically vibrant, and everything looks super-sharp, of course. For photography and 4K video playback, it's pretty much best in class, although we know some people don't like the glossy, glass-coated finish.

It does have one downside, though, which is that it's not rated for HDR at all — having a built-in way to check your HDR grading would've been a boon for pro video editing. The 500-nit brightness (comparable to some monitors that say they are HDR-capable) is a start, but is way below the 1,000 nits expected for true HDR LCD TVs. It's also not a native 10-bit display, which is what HDR requires, instead using spatial and temporal dithering techniques to mimic 10-bit colour on an 8-bit display. The difference is small

and the complaint niche, but 'small' and 'niche' are the main words we'd use to describe this Mac's intended audience, so it's worth noting.

PORTS MEAN PERIPHERALS

At the rear, it's nice to see Apple has avoided cutting back on connections, as it did on the MacBook Pro — you get four USB-A ports, an SDXC card reader, a 3.5mm jack, the humble Ethernet port (but with support for a not-so-humble 10Gbps connection) and four Thunderbolt 3 ports (which double as USB 3.1 because that uses the same USB-C connector). Again, the need for Thunderbolt 3 is niche, but it's heaven if you have 4K videos to import or need up to two more 5K displays.

The ports have the same problem regular iMacs have, though, which is that they're a pain to reach. It's hard enough to get a USB-A plug the right way up first time anyway, but especially while fumbling around the back of this beast. Think about adding a USB hub or a Thunderbolt 3 dock to help with this.

Would we recommend the iMac Pro, then? Absolutely, but only if it really works out as being worth it for you — and only if you have the business accounts to calculate that. If you only want to know whether the iMac Pro is a stunningly powerful miracle of design, though, the answer is a firm 'yes'. ∎

COMING SOON: A LUXURY HOTEL IS SET TO OPEN IN SPACE

GRAND OPENING SLATED FOR 2022.
Called Aurora Station, this luxury hotel module will be launched into a low-Earth orbit at an altitude of 322km in 2021 and will have two-person private suites for a 12-day round trip. Stays will cost well over US$20 million and guests will be taken on trips to the International Space Station. A three-month training program will, however, need to be undertaken by any guest to get them astronaut-ready. [SS]

NSW TO REVIEW WHAT HAPPENS TO SOCIAL MEDIA ACCOUNTS POST-DEATH

LIST YOUR ONLINE ASSETS IN A WILL.
What happens to social media accounts after a person has died will be reviewed by the NSW Government in laws that will overhaul legislation governing wills, estates and privacy. Current laws regarding digital accounts of the deceased are complicated, but the review will take into consideration copyright, privacy, crime, estate administration, as well as service agreements with media companies, in a process the NSW Attorney General calls "long overdue". [SS]

ECUADOR CUTS OFF JULIAN ASSANGE'S ACCESS TO THE INTERNET

ALL TO KEEP HIM FROM MEDDLING IN CURRENT AFFAIRS.
Ecuador's London Embassy, the home of Julian Assange since 2012, has cut off the Wikileaks founder's internet access in a bid to stop him from "meddling in other countries' affairs". Assange took to Twitter to question the accusations laid by 20 countries against the Kremlin for the nerve agent attack on a Russian ex-spy and his daughter in the UK. The British Foreign Office responded to the tweet by calling Assange a "miserable little worm". [SS]

[STANDING TOGETHER]

Major tech companies publicly vow to prevent governments waging cyber warfare

NO MORE MEDDLING IN THEIR PRODUCTS NEITHER.

WHILE US PRESIDENT Trump's new national security advisor, John Bolton, has made clear that one of the ways to get back at Russia for meddling in US affairs is to launch "retaliatory cyber campaign", major global corporations are determined to not let that happen.

34 global corporations, including Microsoft, Nokia, Cisco, HP and Facebook, have signed the Cybersecurity Tech Accord, a pledge to ally together and defend consumers against cyber attacks. The accord states that the coalition "will not help governments launch cyberattacks against innocent citizens and enterprises from anywhere". The agreement will "empower civilians online" and "improve the security, stability and resilience of cyberspace", with each company promising to not aid governments bolster their cyber capabilities.

The companies have also promised to protect against "tampering and exploitation" of products and services by governments. The promise includes establishing stronger defences against malicious code, securing their own goods and services and improving "technical collaboration" and "coordinate vulnerability disclosures".

[SHARMISHTA SARKAR]

[FASTER AND FURIOUSER]

Aussies are opting for faster NBN plans but complaints are on the rise

AVAILABILITY OF HIGHER-SPEED PLANS IS CAUSING CONGESTION, AGAIN.

THE NUMBER OF Aussies opting for the higher NBN speed tiers is increasing, according to NBN Co's March 2018 report. More than a million premises have signed up for high speed broadband in the last four months alone. That equates to 37% of homes and businesses now on the NBN50 option, as compared to just 16% from March last year. NBN Co claims that this surge is due to lower wholesale prices that have allowed resellers to purchase more bandwidth. But while the price cuts have led to easy access to high-speed internet, it's also increasing congestion during peak hours.

According to the report, average network congestion is now higher than what it was in February. That's not the only problem facing the NBN, though. The number of complaints about the national broadband service increased more than 200% in the last six months of 2017, according to a report filed by the telecommunications industry ombudsman. The report claims 22,827 complaints were lodged between July and December 2017. However, NBN Co is quick to point out that number of complaints was down by 16% in the last months of 2017. [SHARMISHTA SARKAR]

FACEBOOK CEO MARK ZUCKERBERG HAS SINCE APPEARED BEFORE US CONGRESS, STATING "IT'S CLEAR NOW THAT WE DIDN'T DO ENOUGH TO PREVENT THESE TOOLS FROM BEING USED FOR HARM".
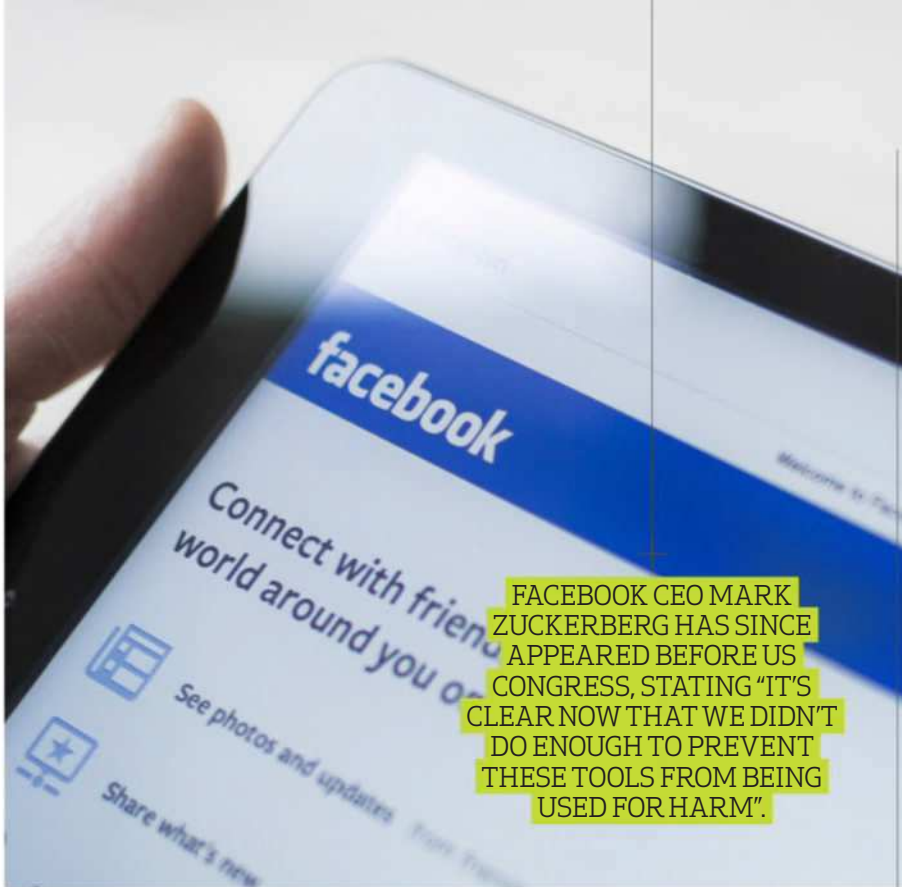
[UNFRIEND]

More than 300,000 Australians among the Facebook Cambridge Analytica leaks

"I STARTED IT, I RUN IT AND I'M RESPONSIBLE", SAYS ZUCKERBERG.

AFTER IT WAS found that Facebook leaked the data of 50 million US users to political consulting firm Cambridge Analytica (CA), the social media platform announced that the figures were closer to the 87 million mark and spanned the globe. CA was used by President Trump's 2016 election campaign and the Brexit 'Vote Leave' campaign, and has since denied Facebook's revised claim, stating that it only collected the information of 30 million individuals. According to Facebook, users from countries such as the Philippines, Indonesia, India, Mexico and the UK were part of the data haul. Australia itself was affected as well, although its 300,000 users only comprised 0.4% of the overall 87 million, of which the US made up the vast majority at 81.4%. Facebook CEO Mark Zuckerberg has since appeared before US Congress, stating "it's clear now that we didn't do enough to prevent these tools from being used for harm. That goes for fake news, foreign interference in elections, and hate speech, as well as data privacy". [HARRY DOMANSKI]

[ANALYSE THIS]

iPhone unlocking tool, GrayKey, is being bought by police departments across the US

HOW TO PROTECT AGAINST ITS BRUTE FORCE METHOD.

POLICE IN THE US are buying a relatively inexpensive iPhone-cracking tool called GrayKey, which works via brute force (ie, guessing) the device's PIN. According to security experts, this would allow it to crack a 4-digit PIN in 6.5 minutes on average or a 6-digit PIN in 11 hours. While there's no word of the device hitting Australia, users should switch to alphanumeric passcodes longer than seven characters, with mixes of uppercase, lowercase and numbers.

[HARRY DOMANSKI]

APPLE WATCH DATA COULD LEAD TO MURDER CONVICTION

FITNESS TRACKING DEVICE COULD BE THE CRITICAL PIECE OF EVIDENCE.

The prosecutor in the murder trial of an Adelaide resident has used the victim's Apple Watch Health data to narrow down their time of death to a 7-minute window. The victim's activity (and, sadly, subsequent lack of activity) happen to be at odds with the story of the accused murderer, who allegedly sent a text message and made an eBay purchase posing as the victim more than half an hour after the crime was committed. [HD]

ACCC WILL FORCE NBN CO TO REVEAL MORE NETWORK SPECIFICS

LOCAL CONNECTION TYPES AND NUMBERS TO BE LISTED IN QUARTERLY REPORTS.

The Australian Competition and Consumer Commission has announced that its ongoing quarterly NBN reports will now be required to include more detailed information, including the number of NBN connections by their geographic region, network technology, speed tier and traffic class. It will also include data on the total bandwidth capacity purchased by all of the NBN resellers combined; however, it won't be possible for the public to determine how much each individual service provider has purchased, as it is claimed that such data could be misunderstood — although the ACCC will be monitoring these numbers internally. [HD]

AUSTRALIA TO GET PHONE-DETECTING TRAFFIC CAMS IN A BID TO CURB DISTRACTED DRIVING

KEEP IT IN YOUR PANTS.

Drivers using mobile phones while driving could soon be caught without them knowing, thanks to new technology that can detect phone use. The tech is slated to be installed in stationary traffic cameras and will also be able to fine drivers automatically — no police intervention needed. This call to action comes after NSW Minister for Roads Melinda Pavey asked for "practical, technology-based solutions" to prevent mobile use while driving, and could make it hard for drivers to get away with the offence. [SS]

Inside TechLife

GET THE LOWDOWN ON TECHLIFE'S EDITORIAL POLICIES, TEST PRACTICES, HOW TO READ THE BENCHMARK RESULTS AND MORE.

TECHLIFE IS AUSTRALIA'S most practical mainstream technology magazine, having been in print since 2012, when we launched as a redesigned and modernised version of *Australian PC User*. The latter was first printed in 1990, and we take that 25-year heritage seriously and strive to be both ethical and transparent in our coverage of technology and any other topics we broach.

Like our sister magazine, *APC*, we have two main goals here at *TechLife*: to track down the best of modern tech and to help our readers get the most from it. We're also an open church in terms of platforms. We know most people aren't wed to a single brand's products and use a variety of devices in their lives. And like you, *TechLife*'s journalists want to know what's good in tech — no matter what platform it resides on.

UNBIASED REVIEWS

Championing technology doesn't mean we're unrelentingly positive, however, and our other aim at *TechLife* is to be as objective as possible in our coverage. That means identifying the best products from multiple perspectives — the best performance, best value and best features and, ideally, the products that offer the best mix of these three aspects.

As a matter of policy, reviews published in *TechLife* are not shared with product-providers prior to print. We will contact vendors under certain conditions; if we have a problem testing a product that seems to indicate it may be faulty, or to invite a vendor to clarify how a particular feature works. If a *TechLife* reviewer has any potential conflicts of interest involving a brand, the review will always be assigned to another writer.

LABS TESTING

We like to review products as though we'd bought them from the shops ourselves. In order to make our reviews and other stories as unbiased as possible, *TechLife* strives to conduct rigorous, objective and scientific tests and benchmarks where possible. We use a variety of tools and programs to achieve this, including many freely available benchmark suites for assessing things like general system performance, gaming, media encoding and battery life.

In most cases, for the benchmark results published in *TechLife*, you can assume that higher is better. There are certain tests that deviate from this rule and where the opposite is true; in those cases, we've flagged the results with a note explaining as such. ∎

The news in numbers

THE KEY FIGURES DRIVING THE LATEST ISSUES
AND TRENDS IN TECHNOLOGY.

[HARRY DOMANSKI]

1,200

NUMBER OF NEWSAGENCIES AROUND AUSTRALIA RESELLING CRYPTOCURRENCIES

A partnership between Bitcoin and payment platform Blueshyft has enabled Aussies to purchase the cryptocurrency from over 1,200 newsagencies around the country, alongside another popular alternative, Ethereum. Customers are required to first install a digital wallet and sign up with Bitcoin Australia before they can place an order online, at which point, they'll receive a QR code that they can take into the newsagency to turn the handed-over cash into Bitcoin or Ethereum.

33,333,333

NUMBER OF HOURS AUSSIES SPEND WATCHING CATCH-UP AND LIVE STREAMING FREEVIEW EACH MONTH

The Freeview March report presented some interesting results on the viewing habits of the seven million Australians that use its on-demand and live streaming services. The two billion minutes (or 33 million hours) per month that these users spent watching these services per month was in fact up 30% over the previous six-month period, suggesting a widespread adoption of the newer technology and associated services.

$347,000

AUSTRALIAN BUSINESSES FORCED TO PAY UP FOR UNLICENSED SOFTWARE

A report released in March has revealed that, over the course of 2017, the Software Alliance settled 28 cases of Australian businesses using unlicensed software, resulting in over $347,000 in damages. Among them was a Western Australian energy company that settled for over $40,000 alone. Beyond the copyright infringement damages that these companies were ordered to pay, they were also forced to purchase genuine licences for the software they were using for ongoing use.

1 in 2

LESS THAN HALF OF RANSOMWARE VICTIMS THAT PAY UP GET THEIR RANSOMED FILES RETURNED

Funnily enough, it turns out that the people responsible for ransomware attacks are also fairly untrustworthy. American cyber security company CyberEdge has found that, of those that paid the ransom for their locked-down software, only half were ultimately able to recover their files successfully. However, of those that simply ignored the ransom demand, 86.9% were able to retrieve their data — most commonly, via a system restore or other back-up method. In other words, if you have important files, make sure you back 'em up!

9.4%

AVERAGE COST OF AUSSIE FIXED INTERNET HAS DROPPED FURTHER THAN IN ANY PREVIOUS YEAR

According to the ACCC, the average price for a fixed internet connection in Australia has fallen by 9.4% over the last financial year, a drop that almost doubles the average decline seen in the last four years. And perhaps because of this, data usage among Aussies is also soaring — between April and June in 2016, we downloaded around two million terabytes in total, but the same three-month window in 2017 saw that number increase to three million terabytes. ▪

WINNER
TECHlife
APPROVED
AWARD

[HDR HERO]

Sony Xperia XZ2

SONY'S BACK WITH ITS BEST FLAGSHIP PHONE IN YEARS, BRINGING WITH IT WORLD-FIRST FEATURES AND IMPRESSIVE SPECS.

[TECHLIFE TEAM]

IT'S OK, YOU can breathe a sigh of relief now... Sony has finally delivered the bold overhaul its Xperia range so badly needed, updating the design with a sleek mirrored finish and less blocky frame, and offering a great set of features inside.

BRAGGING RIGHTS

On the front of the Xperia XZ2, you get a Full HD+ (1,080 x 2,160) display that supports HDR and benefits from Sony's X-Reality Dynamic Contrast Enhancer, creating images and video that look super vibrant. It's a perfect match for the XZ2's most advanced and exclusive feature: HDR video recording. This is a big leap forward for smartphones and looks lush — no surprise here, really, given how Sony's flagships have always been strong with video. Obviously, whoever's viewing these videos needs an HDR screen to properly enjoy them, but it makes showing off your holiday movies to friends on your OLED TV more impressive.

You also get 960fps super slow-motion recording, as with the Samsung Galaxy S9, but on the XZ2, it's in crisp 1080p quality rather than the S9's mere 720p.

Sony has put a lot of effort into enhancing the XZ2's low-light performance, in addition to a faster image processor, all of which makes it easy to take detailed snaps with plenty of depth.

4

SONY XPERIA XZ2
$TBC
sonymobile.com/au

CRITICAL SPECS:
Android 8.0 Oreo;
5.7-inch 1,080 x 2,160
Full HD+ display; Double
Corning Gorilla Glass 5;
Snapdragon 845 processpr;
4GB RAM; 64GB storage;
19MP rear (4K HDR video),
5MP front cameras;
3,180mAh battery;
IP65/68 water resistance;
USB-C, microSD ports;
15.3 x 7.2 x 1.1cm; 198g

We like the curved, mirror-finish back of the Xperia XZ2 — it reminds us a bit of HTC's recent phone designs.

Colour reproduction is also good, with clean vibrant distinction. And we're feeling the right-hand-side mounted camera button, enabling immediate booting into the camera app. There's a little noise when zoomed into images, but this is the only small flaw compared to the S9's camera.

Sony normally knocks it out of the park with internal hardware spec, and it's the same story with the Xperia XZ2. The phone is rocking a all-round stellar hardware package that includes the rapid Snapdragon 845 processor, 4GB of RAM, 64GB of storage and a 3,180mAh battery supporting wireless fast charging.

The XZ2 has a rear fingerprint sensor that isn't quite as comfortable to use as equivalents from HTC and Samsung, yet is far away enough from the camera sensor that you won't smudge it accidentally.

The XZ2 comes equipped with some serious audio credentials, too. High-res audio is delivered, along with DSEE HX technology that upscales files, and there's a pair of stereo speakers that have been tuned to reduce distortion at higher volumes. The speakers are good but no replacement for a proper external speaker. Playing music from the phone on headphones through the provided USB-C audio adaptor (there's no 3.5mm jack) was excellent — everything was clear and rich.

Pleasingly, the Sony Xperia XZ2 comes with Android 8.0 Oreo out of the box, and while the interface isn't stock Android, it is only very lightly skinned, so it still feels familiar and comfortable to use.

The battery life held up very well in day-to-day usage scenarios, with medium usage leading to the phone losing just over 50% of its battery power over 24 hours. Charging was rapid, especially from a low-level starting point, and it took the XZ2 about 40 minutes to attain two-thirds battery life when plugged in. The now widespread Qi wireless charging is here and it's easy to position the XZ2 to get a charge (not the case with some phones).

POPULARITY CONTEST

We're not sure whether the Xperia XZ2 is going to be hugely underrated this year and struggle to sell, or if it will be a sleeper hit for Sony, but it definitely deserves to be the latter. The phone delivers on every hardware front and is housing some world-first features to help separate it from the crowd. Its screen, despite not inheriting the amazing 4K display of last year's XZ Premium, is incredibly vibrant and pleasing to use.

Between that and the push to the new curved, sleeker design that feels far more at home among its premium competitors offerings, the XZ2 is much closer to the S9

in quality. It's still not quite there — the bezels are chunkier and the 3D Creator tool (Sony's equivalent of Samsung's AR Emoji) is a let down — but it feels competitive. Local pricing is still TBC, but overseas it costs (marginally) less than the S9.

While there's no getting around the fact that the S9 is still the most polished Android phone overall, the Xperia XZ2's strong hardware package and fully featured camera system have won us over enough to recommend it if you're into video (and photography in general) on your phone as, in this regard, the XZ2 is the best option right now. ∎

HDR MODE: WHAT TO KNOW
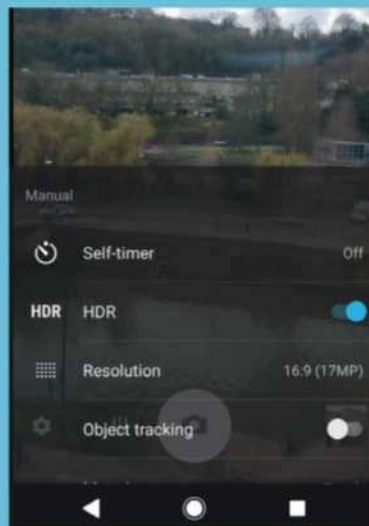
HLG EXPLAINED

The HDR mode in the XZ2 is hybrid log gamma (HLG), and is currently less common than HDR10 (the standard that works on basically everything). This means that not all TVs will be able to play the XZ2's videos in HDR, so check yours.
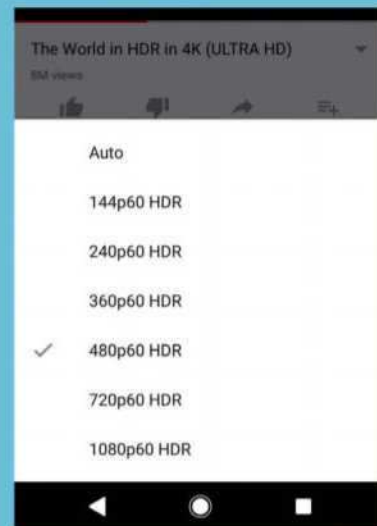
SHARING HDR

You can upload HDR footage to YouTube, which supports HLG, but not all devices can play YouTube HDR — Apple devices especially miss out. Those that do support it can select the HDR option from the 'Settings › Quality' button on YouTube.
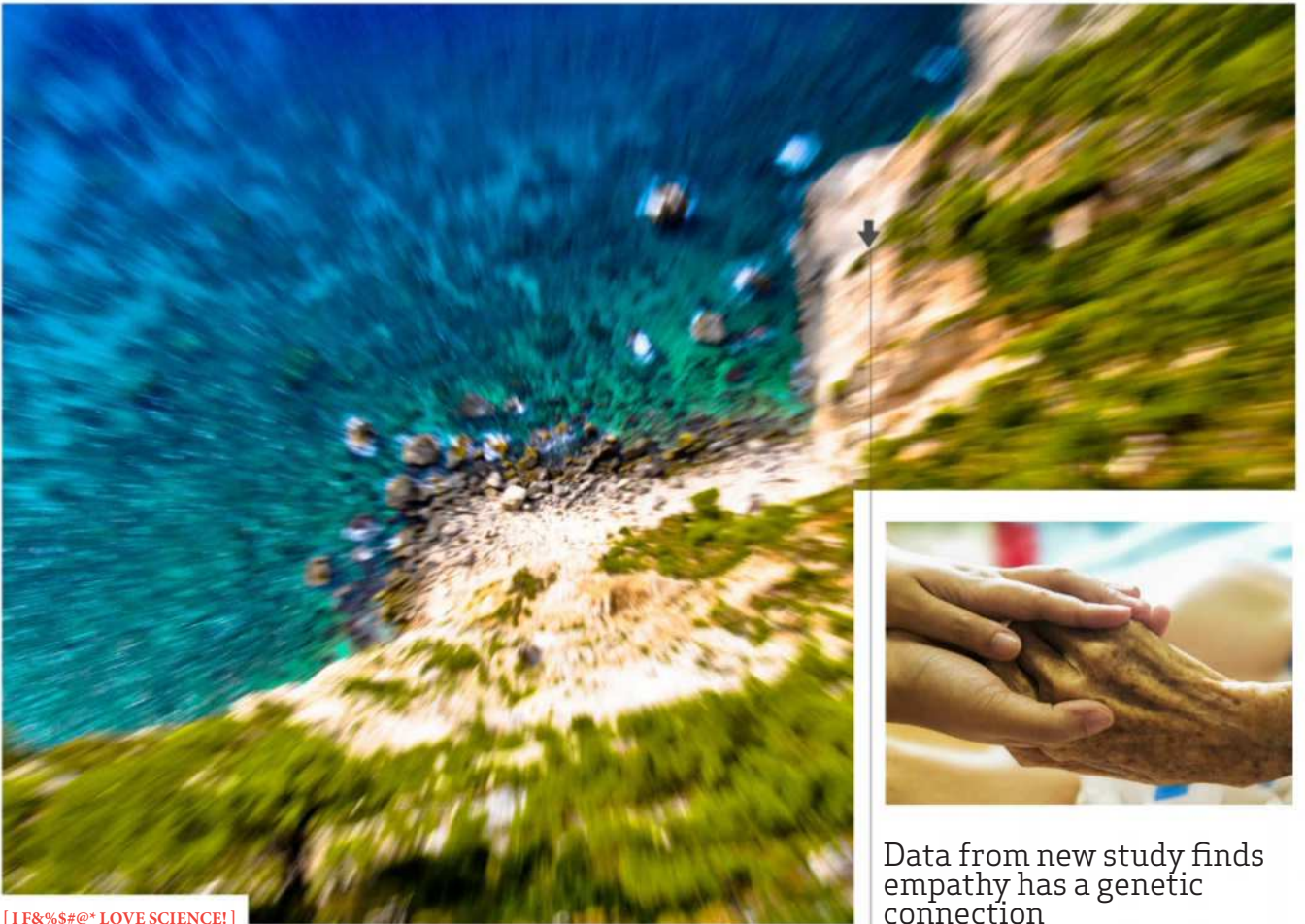
Pop science

THE LATEST DISCOVERIES, INVENTIONS & SCIENCE NEWS HELPING TO SHAPE THE WORLD OF TOMORROW.

[SHARMISHTA SARKAR]

RESEARCHERS ARE WORKING ON A SET OF HEADPHONES THAT COULD HELP WITH VERTIGO

CANS TO STOP THE WORLD FROM SPINNING AROUND YOU.

Despite how common vertigo is — the sensation of the world spinning when looking down — diagnosis is usually difficult. For some people, the condition can be debilitating, and researchers from several German universities are developing a way to help chronic sufferers. The solution is called EQUIVert biofeedback system that works through a pair of headphones, which themselves have a built-in accelerometer and rotational sensors. The sensors pick up when users are standing straight or leaning, triggering verbal cues to play through the headphones, leading the user through a series of exercises that help users stay in the "equilibrium position". The system has been designed to ease symptoms caused in the vestibular organ of the inner ear, the tiny body part that helps us maintain balance. No clinical trials have yet been conducted, but the researchers say medical approval isn't far away.

Data from new study finds empathy has a genetic connection

DOES THIS EXPLAIN WHY NOT EVERYONE GIVES A BABOON'S ANUS?

The ability to empathise with others defines most of us but studying empathy hasn't been easy. While neuroscience has been trying for years to make empathy a tangible entity, a new study published in the journal Translational Psychiatry claims there is a genetic connection as well. The research team, from UK and France, have found that "approximately 10% of the set of differences in empathy in the population is due to genetics". The study has successfully demonstrated that empathetic people have certain genes in common, but which specific ones is yet to be determined. It also found that women were more empathetic than men, but the difference wasn't genetic, however. Instead, it was found that genetic variations associated with lower levels of empathy were associated with a higher risk of autism.

DRUG TESTING ON ANIMALS COULD SOON BECOME A THING OF THE PAST

While science still needs to use live animals to test drugs and procedures, it's also trying to find a way to spare them the agony of being lab rats. A team at the University of Oxford have been researching computer simulations that could see live test animals replaced by virtual ones in the laboratory. Using what the team is calling a **"Virtual Assay"** software, the members were able to develop a computer model of human cardiac cells and were able to run simulations of 62 drug tests, with data matching actual clinical trials and, in some cases, outperforming animal trials. This type of computer modelling could not only eliminate the need to use test animals, but could also help in better understanding conditions like cancer and other genetic disorders.

3D printing and diamonds could make for better biocompatible implants

DIAMONDS CAN BE EVERYONE'S BEST FRIEND.

3D printed bioimplants are becoming common these days, but researchers at Melbourne's RMIT University have figured out a way to make human bodies better accept them. A layer of diamond coating is all that is needed, says the team. While this might seem like an expensive affair, it will, in reality, make the implants more accessible. Diamonds are made out of carbon, and our bodies are 20% carbon. This means that diamond-coated implants will be accepted by bodies quicker, reducing post-surgical complications and quicker healing times. Plus, the diamonds used for this process aren't the kind that need to be mined. They're synthetically created nanodiamonds that can be chemically altered to form a film over a 3D printed layer.

Early birds tend to live longer than night owls, claims new study

DEATH BY DARKNESS.

A new study from Northwestern Medicine and the University of Surrey in the UK has found that 'night owls', or late sleepers and risers, have a 10% higher risk of dying than those who sleep and rise early. The study sampled half a million people and also found that night owls were more prone to conditions like diabetes, mental health issues and neurological problems, and found switching to daylight savings time harder than early birds. The researchers adjusted for current and future health problems and still came up with the 10% higher risk probability. According to one of the scientists, "This is a public health issue that can no longer be ignored". There is hope, however. If night owls are able to change their lifestyles, eat healthy and exercise regularly, they can increase their lifespan.

SCIENTISTS HAVE DISCOVERED A BRAND-NEW HUMAN ORGAN

Using a camera scope, a group of scientists working in New York claim they've found a brand-new organ in the human body. Called the 'interstitium', it's a fluid-filled space found throughout the body — from the skin to the spaces between organs, around blood vessels and muscles — that was previously thought to be connective tissue. Given its expanse across the body, the interstitium is said to be the largest organ. The protein-rich fluid within the interstitium is surrounded by collagen bundles and drains into the lymphatic system — the network that carries disease-fighting white blood cells. This could explain how cancer cells can spread from one part of the body to another, and understanding the new organ could help scientists fight the disease better.

WE'RE NOW TURNING TO AI TO FIND ALIEN LIFE

A group of astronomy buffs have teamed together to develop artificial neural networks that can be used to estimate the probability of alien life on exoplanets. The research, which was presented at the European Week of Astronomy and Space Science in the UK recently, uses spectral data of atmospheric conditions of planets to create profiles to be input into the system. The AI then gives a rough estimate of the probability of the planets harbouring life. The planets are then categorised into five types: present-day Earth, early Earth, Mars, Venus or Saturn's moon Titan. If the probability of a planet sustaining life is high, then it's classified as Earth-like. If the probability is low, then it's more like Venus. At the moment, this AI concept is only at the proof of concept stage, but initial results appear to be promising.

5

SONY ALPHA A7 III
$3,099
www.sony.com.au

CRITICAL SPECS:
24.2MP full-frame back-illuminated CMOS sensor; Sony FE lens mount; 3.0-inch tilt-angle touchscreen, 921,000 dots; 10fps burst shooting; 693-point AF; 4K video; Wi-Fi, NFC and Bluetooth; 710 shots battery life; 650g

[WINNING SNAPPER]

Sony Alpha A7 III

NO LONGER THE POOR RELATION.

[PHIL HALL]

THE ALPHA A7 III sits on the bottom rung of Sony's full-frame mirrorless camera range, and is designed to appeal to both keen enthusiast photographers and professionals. In the past, the A7 series cameras have always felt like poor relations to the A7R and A7S series. While the latter two have tended to capture the limelight with their high pixel counts and advanced video capabilities, the A7 cameras have always been regarded as the basic models, sporting a solid but unremarkable set of features.

That looks like it could all change with this third-generation A7 camera. Borrowing many features from the top-of-the-range Alpha A9, as well as the Alpha A7R III, the Alpha A7 III looks anything but basic.

DYNAMIC PERFORMER

Sony hasn't been tempted to increase the resolution, so it stays at 24.2MP, like the Alpha A7 II. However, the sensor is completely new and features a back-illuminated design, which, combined with the latest BIONZ X image processor, sees the sensitivity range greatly improved over the older model — with an extended ISO ceiling of 204,800 (the same as the Alpha A9), it's two stops better than the A7 II's 51,200 limit. Sony also reckons it's managed to achieve a dynamic range of 15 stops with 14-bit raw files.

While the electronic viewfinder (EVF) doesn't get a bump in resolution to match the A7R III's 3.8 million dots, the 2.3 million-dot EVF on the A7 III gets a slightly higher magnification factor than the older model, up from 0.71x to 0.78x.

The rear 3.0-inch tilt-angle display is now touch-sensitive, enabling you to set the focus point and browse through images quickly, although it doesn't allow for quick navigation of the camera's menu. The 5-axis in-body image stabilisation system has also been tweaked, and now provides five stops of stabilisation, improving slightly on its predecessor's 4.5 stops.

It's no surprise to see 4K video capture on the A7 III. Recording in 24p, the full width of the sensor is used, with full pixel readout and without pixel binning. This sees around 6K of data collected (2.4x the amount of data required), before the footage is then oversampled to produce what Sony says will be 4K footage with exceptional detail and depth. If you want to shoot at 30p, there's a 1.2x crop option that uses roughly 5K of the sensor.

The Alpha A7 III sports two SD card slots, but only one of these supports faster UHS-II cards. There's also Wi-Fi and NFC connectivity for fast image transfer.

BUILD AND HANDLING

The Alpha A7 III has the same body as the Alpha

THE REAR 3.0-INCH TILT-ANGLE DISPLAY IS NOW TOUCH-SENSITIVE, ENABLING YOU TO SET THE FOCUS POINT AND BROWSE THROUGH IMAGES QUICKLY, ALTHOUGH IT DOESN'T ALLOW FOR QUICK NAVIGATION OF THE CAMERA'S MENU.

A7R III and benefits from the addition of a multi-selector joystick, which greatly improves the handling of the camera, with AF point selection that's much quicker out in the field. Another bit of good news is the arrival of a dedicated AF-On button on the rear, making back-button focusing much easier.

Another welcome touch taken from the A7R III is that the eye sensor is now deactivated when the rear screen is pulled away from the body. This means it's possible to shoot waist-level images without the feed cutting out and rather unhelpfully swapping to the EVF.

The body is a touch thicker than the A7 II as well, but it feels more satisfying to hold thanks to a refined grip, and the overall feel is very good due to a predominantly magnesium construction that virtually mirrors that of the Alpha A7R III.

As you'd expect for a camera at this price, all the major buttons and dials are sealed against the elements to protect from dust and moisture. That said, the camera's various terminals don't appear to have quite the level of sealing we'd hope to see, and feels a little flimsy.

SHARP SHOOTER

It's not often that you see a manufacturer take the AF system from its flagship camera and put it in a camera less than half the price, but that's

exactly what Sony has done. The A7 III gets the same, brilliant, 693-point phase-detect AF system as the Alpha A9. This is a huge step up from the rather clunky 117-point system in the Alpha A7 II, with the new system offering an impressive 93% coverage across the frame, with an additional 425 contrast-detect points to aid focus; for good measure, it can also focus in light levels as low as -3EV.

The Alpha A7 III sports a wide variety of AF modes, too, and tracking performance is very impressive. While it can on occasion get tricked by fast and erratically moving subjects, overall, it's an incredibly impressive and reliable system. Also included is Sony's latest Eye AF focusing mode. This is a great feature for portrait and social photographers.

GET THE RESULTS

While the Alpha A7 II could shoot at a modest 5fps, the Sony Alpha A7 III doubles this rate. The camera boasts a pretty impressive buffer capacity of 89 compressed raw files (or 40 uncompressed), while it will happily shoot at 10fps for 177 JPEGs, a huge boost over the A7 II's 52 JPEG file buffer.

Should you need to shoot discreetly or in quiet environments, you have the option to switch to the electronic shutter and take advantage of its silent shooting mode.

The viewfinder is large and bright, and its sharpness is great. If we do have one complaint, it's that you can notice a little bit of 'tearing' should you move the camera from side to side too quickly. The rear display is very good, but as we've found with other Sony Alpha-series cameras, there's still quite a bit of room for further touchscreen integration, especially in terms of menu navigation and settings.

The 5-axis, 5-stop image stabilisation system works a treat. The sensor is capable of delivering images that offer excellent levels of detail. Unless you're planning to produce large prints beyond A2, the A7 III does a terrific job. The back-illuminated architecture helps the A7 III deliver excellent ISO performance. At base sensitivities, files appear incredibly clean and devoid of noise. Even at ISO6,400, results stand up well to close inspection.

VERDICT

Sony has taken some of the best bits from its flagship Alpha A9 and A7R III and distilled them into a single camera that offers a fantastic mix of performance, image quality and price. There's still room for improvement, but those are all minor niggles, which fade away when you look at the wealth of features the Alpha A7 III offers. For the price, there's nothing that can touch it. ∎

[CROWDFUNDED]

Kickstarted!

FROM THE PRACTICAL TO THE QUIRKY TO THE DOWNRIGHT STRANGE, CROWDFUNDING WEBSITES HAVE ALLOWED THE CREATION OF AN AMAZING RANGE OF PRODUCTS. HERE'S A SELECTION OF LATEST PROJECTS THAT PIQUED OUR INTEREST.

[CARMEL SEALEY]

Lexip

THE GAMING MOUSE WITH TWO INTERNAL JOYSTICKS.

tinyurl.com/tla77-lexip | Goal: €25,000 | Raised: €429,621 from 3,824 backers | RRP: €109

Lexip didn't set out to create an office mouse or a peripheral for the casual gamer. This device is for people who need their mouse to do more than just click and scroll. It comes in both left- and right-handed options. Rejoice! There are two joysticks, one you can see on the inner side and an internal one that allows you to tilt the device. This apparently works really well, giving you the ability to tilt it forward or back 20 degrees and also side to side — a great boon for games with elements of flight simulation. The first joystick is for your thumb, and what it can do depends on the game you're playing. It's comfortable to hold in hand, according to the test users, and could give you an edge in gaming, with the ability to lean out from behind walls or cycle through your inventory while on the move. It also includes macro keys and premium materials. There are features for pro users, too, but this is by far and away a mouse for gamers. *Serious* gamers.

[SAD TROMBONE]

The 'Oh, humanity…' kickstarted project of the month

SOMETIMES, WE JUST WISH ALIENS WOULD WIPE US ALL OUT…

MORROR

THE ASSISTANT IN (TO?) YOUR VANITY.

tinyurl.com/tla77-morror | Goal: US$10,000
Raised: $16,536 from 143 backers | RRP: US$230

There's no shortage of tutorials online to help women make themselves look more attractive. But now you can have your very own tutor in your home, namely in your mirror, giving you the advice you so sorely need *[Sarcasm noted — Ed]*. It's predominantly a smart lighting mirror, providing you with the perfect light for applying makeup and tending

to all your ghastly wrinkles, but it also provides tutorials. The display can be turned on or off (hiding the smart features altogether) and the diagram tutorials are fairly discrete, giving you enough room on the mirror to stare at your own mug. But we really do despair sometimes at the extent to which people will go (and expect others to go) to fulfil their beauty needs. Do you really need a tutorial with pictures showing you how to apply face cream, let alone having said tutorials on your mirror? Save your cash on what is essentially a glorified, stupidly expensive light bulb.

CHECKETRY

A DOWNLOAD MANAGER FOR WHEREVER YOU MAY BE.

checketry.com | Goal: $8,000
Raised: $8,339 from 16 backers
RRP: Free, with paid premium version

While the numbers above don't look all that impressive in terms of money raised, the software on offer here surely does. We've all been there, haven't we? We've realised how slow the internet is behaving at home, so we've left our computer on to download something but, during the day, we want to check on its progress but can't… Checketry lets you manage your downloads on your phone while you're away. Not only can you simply view your downloads' progress through the app, you can pause/resume/cancel them, tell your computer to shut down once everything is done, receive notifications of progress, and schedule downloads to start. And it's not just for Windows, it works for Mac as well, and the app is available for both Android and iOS.

SONARPEN

NOT YOUR AVERAGE STYLUS.

www.greenbulb.com | Goal: HK$200,000
Raised: HK$ 724,129 from 2,357 backers
RRP: US$30

Compatible for Android devices, as well as iPads and even iPhones, the SonarPen is the stylus for everyone. It never needs recharging, due to the fact that it's wired, and handily uses the 3.5mm audio jack (if your phone doesn't have one, you'll have to use an adaptor). Its ability to work with almost everything means it's a great tool to have stashed in your bag, ready for when creativity strikes, and the cable can be neatly wound around the pen itself. It works as a good doodling tool, professional stylus for digital art and also just for writing — making it an essential tool for many creatives. So what's special about it? There has to be something, right? Well, yes, apart from its price, the nib of the pen is different. It's flat. It manages to maintain the sensitivity of a regular stylus, while actually having a unique flat surface that perfectly glides across your chosen screen without scratching it. We don't know how it works, so we'll assume magic! ∎

Get Psyched: Happiness and the brain

LEARN MORE ABOUT THE HAPPY CHEMICALS AND HOW TO KEEP THEM TOPPED UP.

[SHARMISHTA SARKAR]

THE ANCIENT GREEKS called it 'eudaimonia', meaning 'what we give to the world'. Happiness is, perhaps, best defined as the persistent, heady mix you get from putting pleasure, satisfaction and whole lot of other feelings together. And while we think happiness is just another emotion, albeit an important one, the human brain considers it to be a means to an end.

Happiness is the brain's way of getting the body to do certain things, but it's transient and — if the number of books on the subject is anything to go by — quite elusive. As far as the brain is concerned, the only way to be happy is to make sure there's chemicals swirling around in the grey mass, chemicals like dopamine, oxytocin, serotonin and endorphins.

THE NEUROCHEMICALS OF HAPPINESS

1. DOPAMINE: THE REWARD MOLECULE
Pleasure is the short burst of happiness you feel when something unexpected happens, releasing dopamine into the brain, like having a great meal or getting a pay rise. This feeling is short lived and makes people seek it more and more, leading to addiction. While dopamine can lead to addictive behaviour, it's all about setting a goal and working to achieve it.

2. OXYTOCIN: THE BONDING MOLECULE
Love — the bond between two people — is linked to the release of oxytocin in the brain. It's even present in our systems when we have a cuddle with our pets. However, there is an ongoing debate on whether oxytocin affects men and women in the same way. There is a possibility that vasopressin (a hormone similar to oxytocin) could be the bonding molecule in men.

3. ENDORPHIN: THE PAINKILLING MOLECULE
Resembling opiates in their chemical structure and analgesic properties, endorphins are produced during strenuous physical activities and sexual intercourse. That sense of euphoria you get after a great workout, or after an orgasm, is linked to endorphins in the brain.

4. SEROTONIN: THE CONFIDENCE MOLECULE
This hormone isn't solely responsible for us feeling confident. It performs multiple functions in the body, but high levels of serotonin is linked to people not feeling rejection too badly, bolstering self-esteem and a sense of wellbeing.

5. ADRENALINE: THE ENERGY MOLECULE
Also called epinephrine, this hormone releases bursts of energy which can be exhilarating. It's associated with increased heart rate and blood pressure, giving you that familiar 'rush'.

STAY TOPPED UP
None of the aforementioned hormones work in isolation. Our sense of happiness comes from a mix of them all. Certain situations warrant a different slurry of chemicals, and the quantity each individual requires differs. There's no one-size-fits-all formula here, but there are things you can do to recharge your brain.

Start by setting yourself daily goals and make sure you achieve them. While you do that, make sure you set time aside for friends and family. Give someone a hug, laugh with them and get that oxytocin flowing. Lifestyle choices are important, too. While eating healthy is good, spicy food and plenty of exercise will release those very important endorphins. And don't forget to spend time outdoors — you'll fill your brain with serotonin. ■

> THERE'S NO ONE-SIZE-FITS-ALL FORMULA HERE, BUT THERE ARE THINGS YOU CAN DO TO RECHARGE YOUR BRAIN.

BARGAIN HUNTER

HELPING YOU TRACK DOWN THE BEST TECH FOR LESS
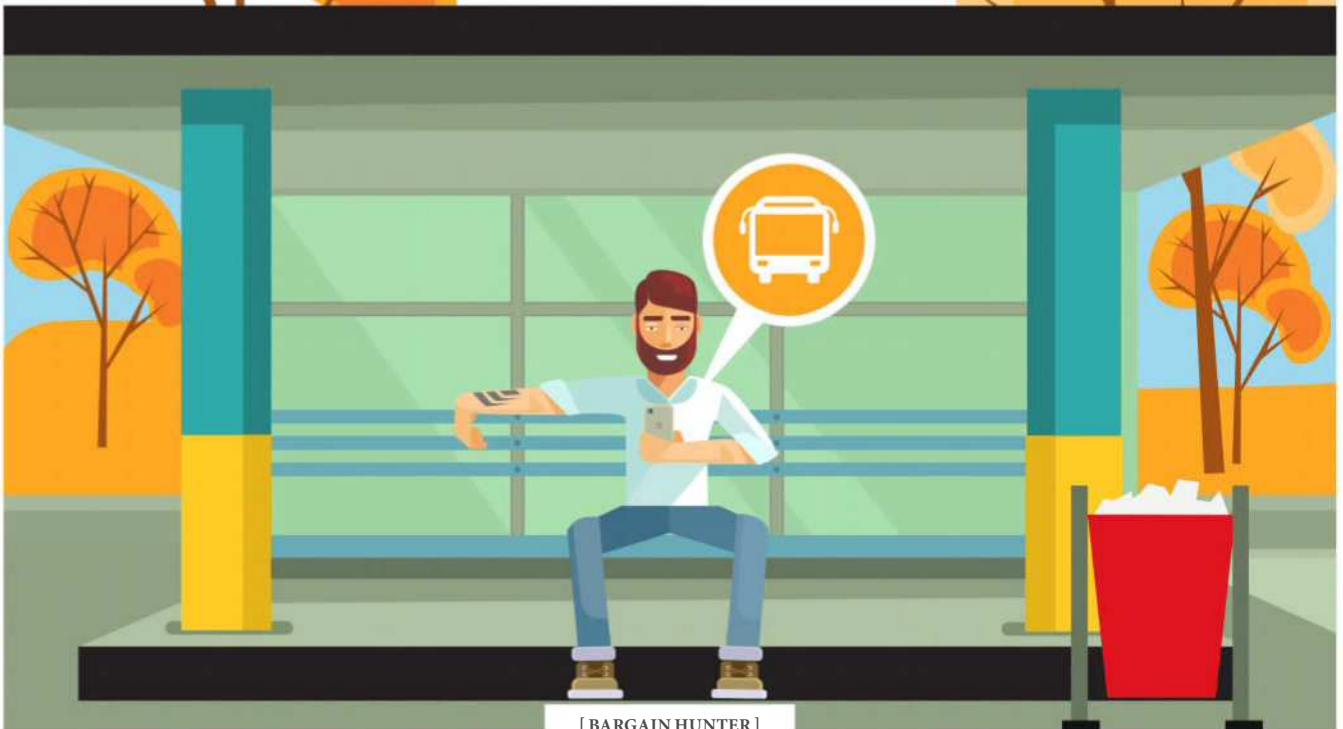
[BARGAIN HUNTER]

Dial up your data plan

GET THE MOST OUT OF YOUR SMARTPHONE WITH MOBILE PLANS THAT WON'T BREAK THE BANK.

[JENNETH ORANTIA]

IT'S ALL TOO easy to default to one of the big three telcos when it comes to your mobile plan. These carriers are highly visible, and are typically the first to offer plan options for the latest flagship phones.

But unless you're specifically looking for a contract plan that lets you pay a phone off in monthly instalments — which is typically how Telstra, Optus and Vodafone reel in customers — you'll get a much better deal by holding onto your existing phone and seeing what's available from network resellers such as Vaya, Kogan Mobile, Woolworths Mobile and Virgin Mobile.

These providers — known as MVNOs (mobile virtual network operators) — lease network capacity off one of the big three carriers, and typically provide cheaper plans with higher data allowances. However, you don't get as many 'frills' with these providers.

VIRGIN MOBILE

Virgin Mobile is the outlier in the equation. While it's an MVNO, piggybacking off the Optus network, it also offers the ability to purchase phones on a two-year contract. If you want to get your hands on the latest handset and you're tossing up between Optus and Virgin Mobile, it's worth noting that the latter usually offers better deals across the board (although Optus has got very good about offering 'limited time offers' that double the data typically offered with each plan). Further, you can visit a Virgin Mobile retail store in person, and streaming music over Spotify, Google Play Music and iHeartRadio doesn't come out of the monthly data allowance.

A couple of other cool features that are exclusive to Virgin Mobile are data gifting and data rollover. Data gifting lets postpaid customers share any unused data on their mobile plan with someone else on the same network, while data rollover automatically rolls any unused data over to the next month. Both features ensure that you're able to use the data you've already paid for more effectively.
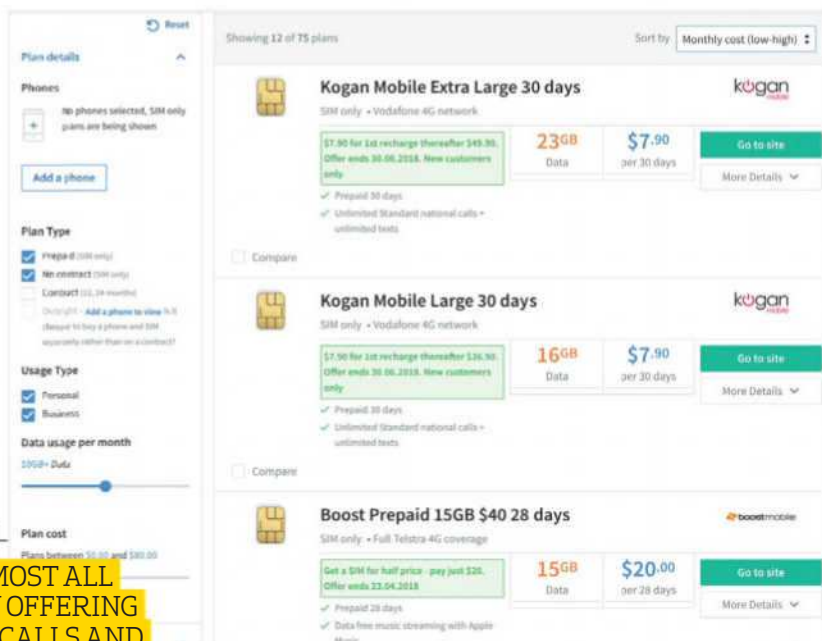
While Telstra, Optus and Vodafone have physical retail presences that you can visit, MVNOs are typically online only, or have SIM cards you can only purchase from post offices and petrol stations. Customer support is typically harder to get a hold of, which can be problematic if your SIM card doesn't activate properly or you have problems with your data connection. Further, extra features like cheaper movie tickets, unmetered audio and video streaming, and bundled international minutes are usually not included.

With almost all plans now offering unlimited calls and texts as standard, it's usually the data allowance that separates one plan from another.

The other reason to go with a shorter-term mobile commitment is that plans are getting cheaper by the month. Tying yourself into a contract means you'll miss out on two whole years of great deals and bargains. Plus, with unlimited mobile data plans just around the corner (Optus offered this to a subsection of customers for a very limited amount of time earlier this year), smart shoppers should abstain from any long-term commitments.

WHERE TO COMPARE PLANS

There are various online comparison engines that let you compare the best mobile plan deals using a variety of criteria such as whether you want to get a new phone with the plan, plan type (prepaid, SIM-only or contract), plan inclusions, and network. The two best sites for comparing mobile plans are Finder (**www.finder.com.au**) and WhistleOut (**www.whistleout.com.au**). However, before using these engines, it's worth delving into

WITH ALMOST ALL PLANS NOW OFFERING UNLIMITED CALLS AND TEXTS AS STANDARD, IT'S USUALLY THE DATA ALLOWANCE THAT SEPARATES ONE PLAN FROM ANOTHER.

the main differences between prepaid plans and SIM-only plans.

PREPAID PLANS

Prepaid plans are an effective way to keep a lid on costs. You pay a set fee, which entitles you to a particular amount of calls, text and data, and this is good for a specific time period, which can be anywhere from 28 days through to the entire year.

There are a few things to look out for when shopping for a prepaid plan. The data included is the most obvious feature, but you should also look to the expiry period if want to get the best bang for your buck.

Most providers have moved from a 30-day recharge window to a 28-day recharge. While two days may not seem like much, this actually works out to one extra recharge over the course of the year — you'll need to recharge 13 times as opposed to 12. Ovo Mobile, Lebara and Kogan Mobile are among the few that continue to charge in 30-day increments.

Another way to save money is by purchasing longer-term prepaid SIM cards. Kogan Mobile, for instance, offers 365-day plans that come with unlimited credit and 6GB of data per month, which works out to be $25 per month — a saving of $4.90 per month compared with the 30-day recharge plan.

It's worth noting that Optus and Telstra are unique with their prepaid plans in that any unused data is rolled over if you recharge the plan within the expiry window. If your data usage tends to go up and down, this ensures you can hold onto data to use during heavier usage months.

SIM-ONLY PLANS

SIM-only plans have emerged as the in-between option for those who don't want to get stuck in a long-term contract, but still want to access the kinds of great deals that have typically been reserved for postpaid users.

In a SIM-only plan, you are still under contract with the relevant provider, but on limited basis — either 12 months or on a month-to-month agreement.

The main differences from an end user perspective is that you'll be subject to credit checks as with any mobile contract (which may cause an issue if you've defaulted on any credit cards or loans previously), and you also open yourself up to excess usage charges when you go over your data limit (which isn't possible on a prepaid).

Thankfully, excess data usage charges are nowhere near as expensive as they used to be; once you use all of your data, you're charged in $10 increments, which gives you an additional 1GB of data each time.

This vulnerability to excess usage charges means telcos have made an effort to make SIM-only plans as tempting as possible. It's no surprise that the 12-month SIM-only plans are the cheapest of all, with Jeenee Mobile offering an impressive 10GB of data and unlimited national calls and SMS for only $25 a month.

Dial it down to a month-to-month contract, and you can still get good deals, with Vaya offering 10GB plans with unlimited calls and texts for $36 per month — and an extra $2 per month adding 200 minutes of international calls to 100 countries. ∎

[NOW, LOOK HERE]

Budget gaming monitors

WE SCOUT AROUND FOR THE GAMING MONITORS THAT PACK IN THE PIXELS FOR LESS. HERE ARE 10 UNITS FOR THE BUDGET-MINDED GAMER FOR LESS THAN $350.

[LINDSAY HANDMER]

GAMING IS NO longer dominated by the high end, and many of the best features are starting to trickle down to low- to mid-range options. Most importantly, it's possible to get adaptive sync and higher refresh rates on screens that cost as little as $250. This means that even a modest GPU can happy push out frame rates over 60fps, and display them without tearing or stuttering. The downside is that, at this level, only FreeSync is supported, so you will only get the best using an AMD GPU.

Of course, there are plenty of budget gaming monitors without adaptive sync, and for some eSports models, that is preferred. For the more casual gamer, these monitors are usually best avoided, as they need a fairly specific setup to be able to get the best from them without experience some tearing. There are also even cheaper basic monitors without any higher tech features, that can still give a decent experience thanks to different game modes.

As always, make sure to shop around for the best prices — we prefer **staticice.com.au** and **getprice.com.au**, but **ebay.com.au** is also often worth a look.

Viewsonic VX2757-mhd
AFFORDABLE GAMING HEAVEN.

WE'VE SAID IT before, and will say it again — the Viewsonic VX series of monitors are perfect for budget gamers. The 22-inch VX2257-mhd is just $169, the 24-inch VX2457-mhd costs just $10 more, and the big 27-inch VX2757-mhd (as tested) is just $250. The key feature of all three is FreeSync support, coupled up with a 75Hz refresh rate. For lower- to mid-range hardware not chasing the ultimate frame rate, this gives a buttery smooth gaming experience for not a lot of money. The screens sport a 1,920 x 1,080 resolution, and use a TN panel to give an excellent 1ms response time.

The VX2757-mhd produces a decent image for the price, with a nice even backlight and no sign of ghosting. FreeSync operates from 47–75Hz, and happily eliminated any tearing and stuttering in our testing. The monitor has HDMI, DisplayPort and VGA inputs, but does not actually include a DisplayPort cable, which is needed to use FreeSync.

Acer KG251QF
AFFORDABLE GAMING PROWESS.

DESIGNED TO GIVE a smooth experience, the Acer KG251QF combines a 144Hz refresh rate with AMD FreeSync. The panel has a fairly unique 25-inch size, and a typical 1,920 x 1,080 resolution. As expected in this price range, it uses a TN panel, which gives a fast 1ms GTG response rate. For $299, you don't get an adjustable stand, and the monitor is fairly plain. But for actual gaming, it happily eliminates tearing and stuttering at even very high frame rates. It also has reasonable viewing angles and colour reproduction, as well as an even backlight with only minimal bleed. Round the back, the monitor has HDMI, DisplayPort and DVI inputs, and importantly, it comes with a DisplayPort cable, so is ready to go out of the box. The inbuilt 4W speakers are better than expected, too. The KG251QF has relatively thin side bezels, so is not a bad choice for a multi monitor setup. Still, it faces stiff competition from other FreeSync monitors.

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10 **BUDGET GAMING MONITORS**

The monitors were connected to a gaming rig with a higher-than-budget spec, to ensure maximum frame rates were possible. FreeSync was tested using an AMD Radeon RX570.

4½

VIEWSONIC VX2757-MHD
$250
www.viewsonic.com

CRITICAL SPECS
27-inch TN panel; 1,920 x 1,080 resolution;
HDMI, DisplayPort, VGA

4

ACER KG251QF
$299
www.acer.com

CRITICAL SPECS
25-inch TN panel; 1,920 x 1,080 resolution;
HDMI, DVI, VGA

WINNER
TECHlife
APPROVED
AWARD

WINNER
TECHlife
APPROVED
AWARD

AOC G2778VQ

FREESYNC FUN.

WITH A LITTLE shopping around, the AOC G2778VQ can be picked up for as little as $260. The 27-inch monitor is aimed at low- to mid-range gamers who want a smoother gaming experience using FreeSync. It features a 75Hz refresh rate, which, while not as high as more expensive monitors, is enough for a vastly improved gaming experience. No surprise for the price, it uses a TN panel, with a 1ms GTG response time, and a 1,920 x 1,080 resolution. The monitor also has built-in game modes for different genres, as well as shadow control.

All the in all the G2778VQ provides a quality image, with vibrant colours despite the matte finish and very usable viewing angles. It's also bright with an even backlight, and the fast response time means no ghosting. Most importantly, though, the FreeSync support totally eliminates any stuttering and tearing. Round the back, the monitor has HDMI, DVI and VGA inputs but no DisplayPort cable in the box, which is needed to use FreeSync.

BenQ ZOWIE RL2755

AN ESPORTS MONITOR WITH A TWIST.

UNLIKE THEIR PC-FOCUSED brethren, the BenQ ZOWIE RL monitors are also built for getting the best experience when console gaming. There are two models — the 27-inch RL2755 for $350, or the 24-inch RL2455 that costs $250. Both monitors use a 1ms GTG TN panel, with a 60Hz refresh rate and no adaptive sync. They also use a 1,920 x 1,080 resolution and have dual HDMI inputs, as well as DVI and VGA connections.

Where the BenQ screen attempts to stand out is with a range of special game modes for different genres, but is optimised for FPS. It also has a black equaliser ode to increase detail in dark area. The stand has the basic tilt adjustment, speakers and a 3.5mm audio output for using headphones. It produces a reasonably accurate image, with bright colours and an even backlight. The game modes are quite good, and it is designed to have minimal input lag. But it's a hard sell over some of the versatile competition.

4

4

AOC G2778VQ
$260
www.aoc.com

CRITICAL SPECS
27-inch TN panel; 1,920 x 1,080 resolution;
HDMI, DisplayPort, VGA

BENQ ZOWIE RL2755
$350
www.benq.com

CRITICAL SPECS
27-inch TN panel; 1,920 x 1,080 resolution;
dual HDMI, DVI, VGA

BUDGET GAMING MONITORS BUYER'S GUIDE
WHAT TO LOOK FOR WHEN BUYING A GAMING MONITOR.

FREESYNC
You will need an AMD GPU to be able to use FreeSync, but it does give a wonderfully smooth gaming experience.

REFRESH RATE
A higher refresh rate allows your to actually see high frame rates and even just 75Hz makes a big difference when gaming.

PANEL TYPE
Most gaming panels are TN based, but for those who want accurate colours and wider viewing angles, there are a few that use IPS.

RESOLUTION
At the affordable end of the spectrum, 1,920 x 1,080 is the most common resolution and easily pushed to higher frame rates with low- to mid-range GPUs.

GAME MODES
Game modes can help tweak your experience for different genres, and having a black equaliser helps enhance dark areas.

CONSOLE VS PC
While most gaming monitors are aimed at those with PCs, there are also some with features for those who like to use a console.

STAND
The better monitors have a fully adjustable stand, which makes it easy to set at the perfect height and angle for comfortable gaming sessions.

ACCESSORIES
Check what is included in the box — some monitors don't include anything beyond a DVI cable, with the necessary HDMI or DisplayPort cables needing to be bought separately.

WINNER
TECHlife
APPROVED
AWARD

WINNER
TECHlife
APPROVED
AWARD

WINNER
TECHlife
APPROVED
AWARD

BenQ ZOWIE XL2411P

AIMED AT PROFESSIONALS.

JUST SCRAPING IN at $349, the 24-inch BenQ ZOWIE XL2411P is designed specifically for eSports. The screen shows off a 1,920 x 1,080 resolution, and uses a TN panel to give a 1ms response time. The gaming chops of the XL2411P come from the native 144Hz refresh rate, for ultra smooth gaming. It's aimed at a subset of gamers, though, who have a specific setup that can get the best from the monitors, as it does not feature any adaptive sync technology. Still, for those who can push the monitor with a decent GPU, it gives a top-notch experience. It also has special blue reduction backlight strobing, as well as a black equiser and modes aimed at different games, such as FPS.

As a TN panel, the colours and view angles of the BenQ monitor are not amazing, but get the job done. It also has an excellent height adjustable stand that makes it easy to set up the optimum gaming environment.

LG 27MP59HT-P

A GAMING OPTION WITH SOMETHING EXTRA.

WHILE MOST MONITORS aimed at gamers use TN panels, this uses IPS technology. That's handy for those who want the best colour reproduction and viewing angles, and can help make the screen more usable for productivity tasks. It comes in two different sizes — 24-inch for $270 and 27-inch for $300. The LG features a 1,920 x 1,080 resolution, and can display over 99% of the sRGB Colour Gamut. It also has a 5ms response time, which is brought down to a virtual 1ms with LGs motion blur reduction tech. But the real gaming features are the 75Hz refresh rate, coupled up to AMD's FreeSync.

In use, it gives a noticeably better picture than its TN-based competition. We also didn't notice any blurring during normal gaming, and FreeSync did a great job of eliminating tearing. The monitor also has some handy features, such as a black stabiliser mode, and splitscreen. While hardcore gamers will seek faster refresh rates, this is a great monitor for those who still need everyday image quality.

Samsung LC24F390FHE

A GAMING MONITOR WITH A DIFFERENCE.

WHILE MOST MODELS are boring and flat, the Samsung LC24F390FHE has a 19° curved panel. Even better, the 24-inch screen is only $200, while the larger 27-inch model is $275. As far as gaming monitors go, the Samsung is a little weird, and uses a VA panel which has a slower-than-typical 5ms GTG response time. It does have AMD FreeSync, but only operates up to 60Hz, so isn't aimed at those trying to push their frame rates. The Samsung has the typical 1,920 x 1,080 resolution, and HDMI and VGA inputs.

Thanks to the VA panel, the monitor has excellent colour reproduction and improved viewing angles. The 3,000:1 native contrast ratio is excellent, and helps give deep blacks and bright colours. Samsung has implemented FreeSync well, and it a gives smooth gaming experience, and even the 5ms response time shows no issues with ghosting. The curved panel does improve immersion, making this a solid choice for casual gamers.

4

BENQ ZOWIE XL2411P
$350
www.benq.com

CRITICAL SPECS
24-inch TN panel; 1,920 x 1,080 resolution; HDMI, DVI, VGA

4

LG 27MP59HT-P
$299
www.lg.com

CRITICAL SPECS
27-inch IPS panel; 1,920 x 1,080 resolution; HDMI, DVI, VGA

4

SAMSUNG LC24F390FHE
$200
www.samsung.com

CRITICAL SPECS
24-inch curved VA panel; 1,920 x 1,080 resoltuion; HDMI, VGA

WINNER
TECHlife
APPROVED
AWARD

Viewsonic XG2401

MAKING A COMEBACK.

JUST GETTING RELEASED back into the market after selling out, the Viewsonic XG2401 is aiming to provide high refresh rate gaming for under $350. The screen's gaming credentials come from FreeSync support, as well as a high 144Hz refresh rate and 1ms response time from the TN panel. The 24-inch screen has a 1,920 x 1,080 resolution, and is aimed at mid-range AMD gamers who want to push for faster frame rates but don't have the grunt for higher resolutions.

For a TN panel, the screen gives decent colour reproduction and viewing angles, with even backlighting. With FreeSync enabled, it happily provides buttery smooth gaming with no evidence of tearing. It's well worth tweaking the display settings, and there are some game modes to help out. The monitor has dual HDMI ports, DisplayPort and dual USB. It also has a top notch stand, with height, pivot, tilt and swivel adjustments, as well as a cable organiser around the back.

ASUS VG248QE

FOR HIGH FRAME RATE GAMING.

SOME SAVVY ONLINE shopping is needed to find the ASUS VG248QE for under $350, but the screen just squeaks in under our price limit. Aimed at mid-range gamers who want to push their frame rates, the 24-inch screen features a 144Hz refresh rate but not any adaptive sync support. That is not actually too much of an issue in the real world, as long as you plan to very consistently push your frame rates very high. The VG248QE has a 1,920 x 1,080 resolution and, thanks to the TN panel, a fast 1ms GTG response time.

Colours and viewing angles are fairly typical, but with a little tweaking, the screen can look quite good. Getting a fast gaming experience is easy, but it can take some fiddling to make sure it stays smooth. The monitor has some game modes, and an excellent stand with height, tilt pivot and swivel adjustments. It has HDMI, DisplayPort and DVI inputs, but only comes with a cable for the latter.

Dell SE2417HG

A VERY AFFORDABLE OPTION.

A GAMING MONITOR with the latest adaptive sync technology is great and all, but some gamers just want a super affordable options without all the extras. The Dell SE2417HG caters to that market, and the monitor costs just $200. It measures in at 23.6-inch and has a 1,920 x 1,080 resolution, and a 60Hz refresh rate. The screen uses a TN panel, with a reasonable enough 2ms response time.

As the cheapest of the Dell gaming monitors, we didn't have overly high hopes, but the SE2417HG was quite usable. Sure, the viewing angles are a bit rubbish, but it's vibrant and bright with a fairly even backlight. We noticed a tiny bit of ghosting on faster titles, but for casual gaming, it's just fine. The monitor had dual HDMI inputs, as well as legacy VGA — though, annoyingly, only a VGA cable in the box. It does not include any speakers, but does have an audio line out to pass sound from HDMI. ∎

4

VIEWSONIC XG2401
$350
www.viewsonic.com

CRITICAL SPECS
24-inch TN panel; 1,920 x 1,080 resolution; Dual HDMI, DisplayPort

3½

ASUS VG248QE
$350
www.asus.com

CRITICAL SPECS
24-inch TN panel; 1,920 x 1,080 resolution; HDMI, DVI, VGA

3½

DELL SE2417HG
$199
www.dell.com

CRITICAL SPECS
23.6-inch TN panel; 1,920 x 1,080 resolution; dual HDMI, VGA

DISCOVER

ESSENTIAL APPS, TOOLS AND ENTERTAINMENT

[IT'S TIME TO JOIN THE MESSAGING REVOLUTION]

Social media pro: WhatsApp

GO BEYOND BORING WITH THIS POPULAR MESSAGING APP.

[TIM BOTHWELL]

THE HUMBLE SMS has been around for over two decades, and let's face it... text messages are no longer innovative like they once were. Looking at the plethora of messaging apps now available for smartphones, the 160 character word limit doesn't cut it. While MMS gives the ability to send photos and videos, so can many popular social networking platforms, and that's in addition to the many other features like video calling, document sending, even location sharing. While some smartphone companies have created their own messaging platforms, such as iMessage, try talking with someone on a different OS and you'll be at a loss. As one of the most popular cross-platform apps worldwide, WhatsApp is the perfect solution. Rather than rely on a carrier service, it uses your phone's mobile data connection to send and receive messages, with absolutely zero cost to you. Here, we'll run through the steps to setting up a new account, before highlighting the many features available.

THE BASICS

SIGNING UP: After opening the app for the first time, you'll be asked to provide a mobile phone number, which WhatsApp will then send a verification code via SMS. This is to ensure the mobile phone number does in fact belong to you. If you've previously installed WhatsApp, you'll be asked if you want to restore your conversation history from the cloud. Lastly, add a display name and profile picture before pressing done.

ADDING CONTACTS: While social networks such as Facebook require you to manually find and add new friends, with WhatsApp, the process is so much simpler. During sign up, the app will request access to your phone contacts... that's all you need to do. People from your phone book who have WhatsApp installed will appear in your contact list instantly — no friend requests required. If there's someone not yet using the app, you can invite them by navigating to the new chat screen and scrolling to the bottom of your contact list — it's here you'll see the option to send them a link via SMS or email.

SENDING MESSAGES: To start a new conversation, tap the button in the top right corner of your chat screen and choose a recipient. The grey tick underneath each message indicates that it's been sent from your device, while two ticks shows the message has successfully reached the recipient. If your friend has read receipts on, ticks will also turn blue once a message has been viewed. Change the formatting of a message by selecting your text and tapping BIU from the context menu. Press the plus button to send photos, videos and documents; while holding the microphone icon allows you to record a voice memo.

STATUS UPDATES: There's one feature that seems to be popping up in many of the social media apps we've covered over the last few months. The humble story which expires after

24 hours is something that first emerged on Snapchat, before appearing on both Instagram and Facebook soon after. Not one to miss out on a fad, WhatsApp introduced its own version called status updates in 2017. To add a post, visit the status tab and press either the camera or pencil tool. On this page, you'll also find a list of recent posts from friends. You can adjust who sees your status updates from the account section of settings.

STEP IT UP A LEVEL

PRIVACY: Because WhatsApp doesn't rely on friend requests, anyone with your phone number can send you messages. Hence, it's important to know your options if things end up going sour. Muting will cease all notifications from a contact for eight hours, a week or a year; while blocking will prevent them from contacting you ever again. These options can be accessed either by swiping left on a conversation tile or from the contact profile screen of a chat.

GROUP CONVERSATIONS: Making plans with friends is extremely easy thanks to the group messaging feature. Press the new group button at the top of your chat screen and select who you wish to add. You can then give your group a name and icon.

BROADCAST LISTS: While a group message allows you to conduct conversations amongst each other, you can also send a blast message to multiple contacts at once. This can be useful

Please confirm your country code and enter your phone number

Australia

+61   your phone number

During signup, you'll be asked to provide a mobile phone number for verification purposes.

Camera

Photo & Video Library

Document

Location

Contact

Not restricted to text, WhatsApp allows you to send photos, videos and documents.

Any status updates you post will expire after 24 hours.

Add a caption...

> My Status

Edit

Chats

Search

Broadcast Lists   New Group

5:42 pm

More   Archive

8 hours

1 week

Mute a conversation for eight hours, a week or an entire year.

Back   New Group   Create

Group Subject

Please provide a group subject and optional group icon

PARTICIPANTS: 2 OF 256

Brad   Taylah

Choose which contacts you want added to a group conversation.

Broadcast Lists   Edit

Work Colleagues
Brad, James

Send the same message to multiple people at once using a broadcast list.

Messages to this chat and calls are now secured with end-to-end encryption. Tap for more info.

Hey, what was the name of that restaurant? 5:47 pm

☆   Reply   Forward   Copy   Delete

McDonald's! 6:05 pm

Paying for premium unlocks a number of useful features.

Chats

Broadcast Lists   New Group

5:42 pm

More   Archive

Send a conversation to the archives by swiping left on a chat tile.

for things like sending invitees the location of a party. Broadcast lists can be found at the top of your chats screen.

VIDEO CALLS: Some of you will be familiar with the frustration brought on after commencing a Facetime call with a friend, only to discover they're using an Android device. Rather than lecture them on the reasons to purchase an iPhone, just ask them to download WhatsApp. Once done, simply tap the phone or video icon at the top of the conversation to commence a call over Wi-Fi (or 4G). This is especially useful for calling people overseas.

BACKING UP: It's amazing how much information gets said in a single conversation. Hence, losing your message history following a phone upgrade (or breakage) can actually be quite traumatic. Luckily WhatsApp allows you to back up your chat history to the cloud for
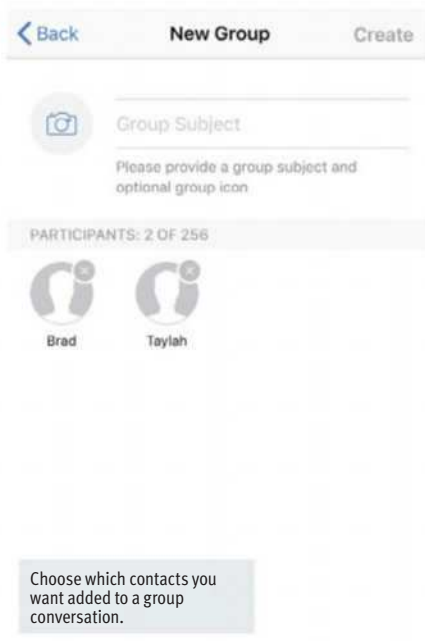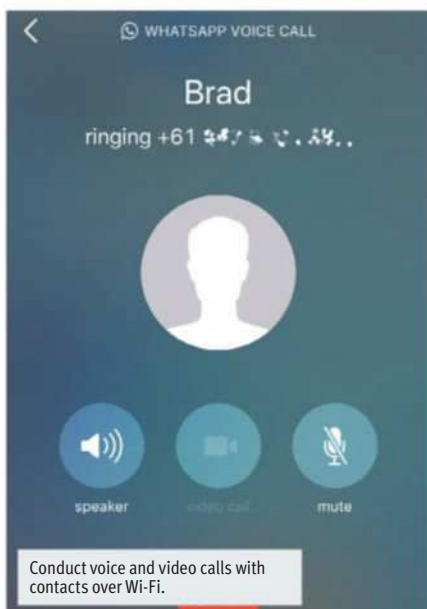
safe keeping. You can modify how often backups occur from the chats section of settings.

STARRED MESSAGES: Don't strain yourself scrolling through months of messages to find that amazing restaurant recommended by a friend. Simply tap and hold on a message to see a star icon appear in the context menu. Every message you currently have starred can be found in settings.

GOING PRO

ARCHIVE: No longer talking to that special someone from Tinder? You can archive chats by swiping left on a conversation tile. While this removes it entirely from the chat screen, you can still access archived conversations by entering the recipient's name into the search bar.

WHATSAPP VOICE CALL

Brad

ringing +61 ...

speaker   video call   mute

Conduct voice and video calls with contacts over Wi-Fi.

Chats   Chat Backup

Last Backup: Tuesday, 6:34 pm
Total Size: 57.1 MB

Back up your chat history and media to iCloud so if you lose your iPhone or switch to a new one, your chat history is safe. You can restore your chat history and media when you reinstall WhatsApp. Media and messages you back up are not protected by WhatsApp end-to-end encryption while in iCloud.

Back Up Now

Auto Backup   Weekly

The built-in backup feature sends all your conversations to the cloud for safe keeping.

Exporting makes it easy to save conversations outside of the app.

Contact Details

Share Contact

Attaching media will generate a larger chat archive.

Attach Media

Without Media

‹ Chat Wallpaper Wallpaper Library

Choose from a number of backgrounds able to be displayed behind conversations.

Share your live location with contacts for a period of time.

‹ Settings Data and Storage Usage

MEDIA AUTO-DOWNLOAD

Photos   Wi-Fi and Cellular ›
Audio   Wi-Fi ›
Videos   Wi-Fi ›
Documents   Wi-Fi ›

Reset Auto-Download Settings

Save data by modifying when WhatsApp downloads attachments automatically.

EXPORTING: Take your conversation history away from WhatsApp using the super handy export feature. Simply swipe left on a conversation tile and tap the more icon. Here, you'll see the option to export with or without attachments — note this if you're after a smaller file size. The folder can then be sent via text, mail or shared to another app.

WALLPAPER: Make your messaging experience that little bit more aesthetically pleasing by changing the background behind conversations. Located in the chats section of settings, change your wallpaper to one of the pre-existing backgrounds, solid colours or a photo from your camera roll.
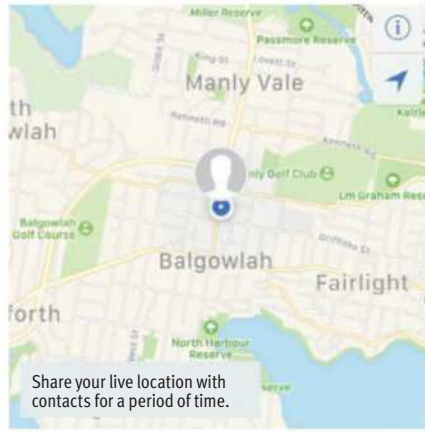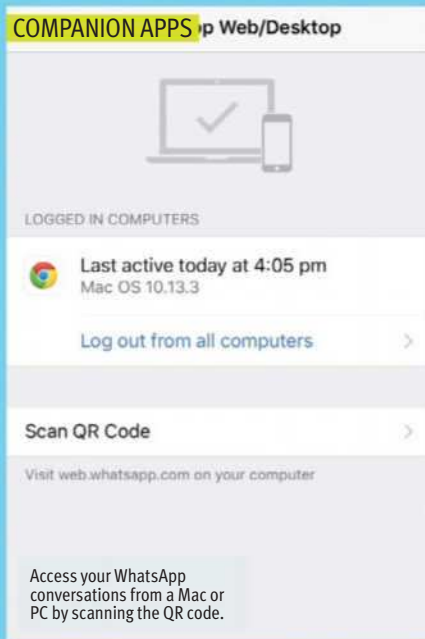
LOCATION SHARING: WhatsApp lets you share your current location with friends. Simply tap the plus button and press location. You can even let others track your movements for a specified period of time — helpful in situations like trying to find friends at the beach.

DATA USAGE: While sending messages on WhatsApp is 100% free, your mobile data is not. Hence, you may want to think twice before sending (or receiving) an endless number of photos and videos from friends. By default, WhatsApp will automatically download attachments sent by contacts whilst connected to Wi-Fi. This can be changed from the data and storage usage section of settings.

PINS: If you frequently speak with a particular person, you can pin their conversation tile to the top of your chat screen. Simply swipe right on a conversation and tap the pin. Do the same again to undo. ∎

COMPANION APPS p Web/Desktop

LOGGED IN COMPUTERS

Last active today at 4:05 pm
Mac OS 10.13.3

Log out from all computers ›

Scan QR Code ›

Visit web.whatsapp.com on your computer

Access your WhatsApp conversations from a Mac or PC by scanning the QR code.

Send a WhatsApp message to Brad
Tap to Edit ›

What do you want to say?

WHATSAPP
Brad

Use Siri to send messages without even opening the app.

Business

WhatsApp Business App

WhatsApp Business is an Android app which is free to download, and was built with the small business owner in mind. With the app, businesses can interact with customers easily by using tools to automate, sort, and quickly respond to messages.

DOWNLOAD FOR ANDROID

WhatsApp Business allows companies to set up automatic responses to messages from customers.

WEB ACCESS
Free
web.whatsapp.com

While the keyboard on your smartphone may seem convenient, typing a message more than a few sentences long will make you wish you had a physical keyboard. If your computer is nearby, you can access WhatsApp conversations via a web browser. Just visit **www.web.whatsapp.com** and use your smartphone to scan the QR code displayed on the screen. You'll find the scan feature in the web/desktop section of settings.

VOICE CONTROL
Free
URL: NA

Sometimes, the effort required to unlock your phone, locate an app and begin typing a message can seem too much. But don't despair, because WhatsApp allows you to send and receive messages using just your voice. On an iPhone, you can ask Siri to read out new messages along with draft up replies. For Android devices, you'll need to talk to Google Assistant, who can also record and send voice messages.

WHATSAPP BUSINESS
Free
www.whatsapp.com/business

In January this year, WhatsApp launched an app dedicated specifically to small businesses. WhatsApp Business allows companies to create a profile featuring useful information such as store location and phone number, along with the ability to set up automated message responses. At the time of writing, the app was only available in a small number of countries (Australia not included), with a worldwide roll-out expected soon.

SLOW BURN: A PODCAST ABOUT WATERGATE
tinyurl.com/tla77-slow

Told over eight parts of 25–45 minutes each, Leon Neyfakh details the intricate, strange tale of Watergate, including interviews with those involved and those affected. This is a particularly interesting podcast to listen to right now, due to the parallels with what is currently going on in the US, but also for history enthusiasts with a spare few hours.

[WATCH WITH YOUR EARS]

Audio documentaries

THE PODCASTS THAT LET YOU LEARN ABOUT THE WORLD WHILE ON THE MOVE.

[CARMEL SEALEY]

DOCUMENTARIES CAN BE an amazing way to transport viewers to a world — good, bad, exciting, secret or new — from the comfort of their living room or a cinema. But while you might assume that documentaries are so successful in conveying their message or story across by utilising the visual medium of film, we hope these following productions will make you reconsider. It turns out, taking a snapshot of a place, investigating a person or uncovering a conspiracy is less about seeing the documentary makers and their camera crew running after shifty-looking people hiding their faces and more about the meaty information and twists that they discover. And good news for us, podcasts are the perfect medium for grabbing your attention wherever you are. Why not try these for starters?


DOCUMENTARY ON ONE
www.rte.ie/radio1/doconone

Want to hear some tales from Ireland? You're in luck! This production has, reportedly, the largest archive of documentaries available in the world, dating back from the mid 1950s. The stories are all personal, and explore a wide range of subjects and are told by fascinating personalities from all walks of life. It's won a lot of awards, too!

OUR MAN IN THE MIDDLE EAST
tinyurl.com/tla77-east

BBC's Middle East Editor, Jeremy Bowen, takes on the daunting task of documenting one of the world's most turbulent regions... in bite-sized chunks. From oil to Daesh, the Iraq War to politics in Jerusalem. Each episode includes elements of narration, plus on-site reports in the aftermath of bomb blasts and interviews with those who live and struggle to survive there. It's potent, educational and gripping.

THE SECRET HISTORY OF HOLLYWOOD
tinyurl.com/tla77-holly

Curious about the history of Hollywood and what forces came together to make those classic movies you love? The first episode begins with the rise of the Warner Bros. company, detailing how the family came from horror to Hollywood with vivid detail, and the other episodes share this meticulous nature. Someh episodes stretch almost 9 hours in length, so while the number of them are few, you'll be listening for quite some time!

THIS IS ABOUT
tinyurl.com/tla77-about

Coming back home now, and this ABC production introduces us to a swathe of fascinating people. The stories they have to tell are not always of the happy kind, but there's a ton of quirkiness in there, too, to balance it all out. While these stories are, again, very personal rather than the far-reaching scope of some of the others on offer here, they're by no means less interesting.
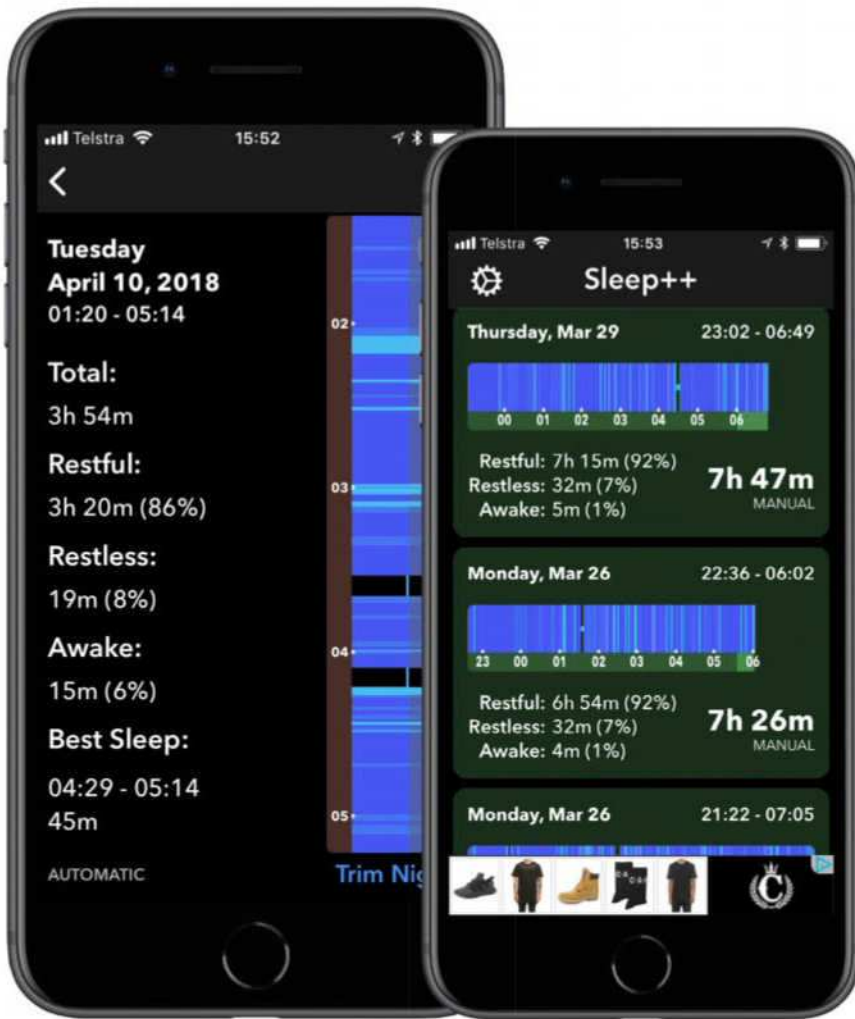
Best new apps

THE *TECHLIFE* TEAM REVIEWS THE MOST INTERESTING NEW APPS FOR iOS, ANDROID AND WINDOWS MOBILE.

Sleep++

MONITOR YOUR ZS WITH THIS WATCHOS SLEEP TRACKER.
Free with IAP | david-smith.org/apps

YOUR HUMBLE AND bleary-eyed reviewer does not sleep well. Going to a doctor and telling them that we wake up five times a night, however, doesn't quite pack as much of a punch as handing over a wad of data, showing exactly when each waking moment occurred and the sort of quality of sleep we were getting. As this is a watchOS app, we were eager to see how accurate the tracking was, so duly donned our device, and engaged sleep mode. It's hard to judge just how truthfully the app labels 'restful' or 'restless' bouts of sleep, as we're, well, asleep at the time — but it's definitely easy to figure out if it misses a 100% awake moment where we were walking around and labels it as 'restless'. This happened to us night after night. It uses the Apple Watch's motion

and health tracking data (such as heart rate) to determine whether you're asleep and how soundly you're resting, so it's unclear whether the app itself is at fault or whether it's the Watch not interpreting movements correctly. While you can engage sleep mode manually, you can also do it post-sleep, then simply choose the hours you were in bed. Amusingly, we accidentally engaged sleep mode at work, and our report at the end of the day stated that we had slept through our 12pm meeting and very peacefully! Basically, we don't think it's accurate enough to be that helpful.
[CARMEL SEALEY]

3

BUDREY

A DECENT BUDGETING APP — BUT IT MAY BREAK THE BUDGET.
Free | rey5137.com

If there's anything more tiresome than earning money, it's making sure that money doesn't slip through your fingers. Which is why there's tons of budget management apps available, and BudRey is the latest candidate. It's as simple as they come: you can create separate budget categories marked by icons (denoting leisure, food and so on) and set limits to each. So if you've got a budget of, say, $800 to spend per month on anything you like, you can enter every leisure purchase into the app as you make it, without needing to check your bank account every time. Reports can be generated as well, based on amount spent, time left before budget period elapses, and the rate at which the budget "burns down" (ie, how quickly you've blown your cash). The free app provides one budget category, while monthly and yearly subscriptions are $2.69 and $26.99, respectively (or else $139.99 forever). This seems expensive, and it is, so we'd advise finding a free or ad-supported budgeting app first, as aside from simplicity, there's not much else that makes BudRey special. [SHAUN PRESCOTT]

3½

TECHlife
ED's CHOICE
AWARD
WINNER

321 LAUNCH

IT'S NOT ROCKET SCIENCE ANYMORE.
Free | www.321launchapp.com

It's easy to be fascinated by the vast expanse that is the dark void beyond Earth's atmosphere, and one way to learn more about space exploration is via *USA Today*'s new app. 321 Launch is an augmented reality app that walks you through building your own rocket and launching. You can even get a live feed to an actual launch when it happens.

The Launch Simulation part of the app is easy to use and well crafted. You'll need a flat surface to build your base station and then drag-and-drop virtual pieces to get it all together. Each step comes with its own narration and information panel, making it appropriate for all ages.

Once assembled, hit the Launch button and watch your rocket take off amongst billowing clouds of smoke. It's an interesting and enjoyable experience. The Live Mission option on the homepage of the app gives you not just a live feed, but lets you swap to an AR experience, with live commentary straight from Cape Canaveral.
[SHARMISHTA SARKAR]

4½
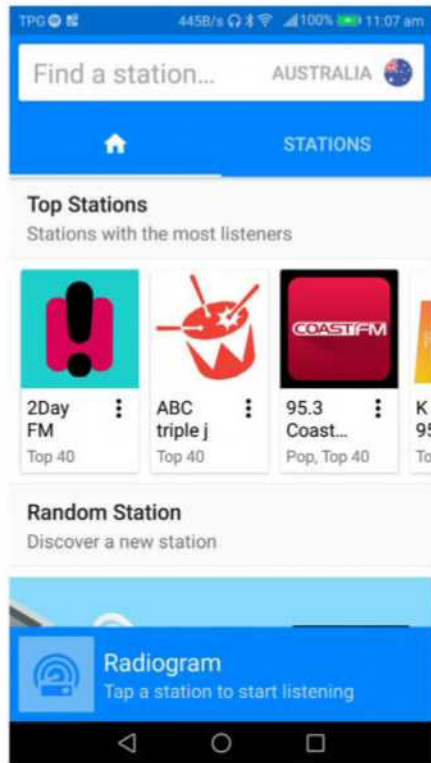
Radiogram

**A RADIO APP THAT BOASTS SIMPLICITY OF DESIGN.**
Free | radiogr.am

Digital radio apps aren't hard to find, with the likes of TuneIn doing a great job of gathering a wide range of live broadcasts from around the world, in addition to podcasts and on-demand services. Meanwhile, the likes of the ABC have apps that provide access to its whole array of stations, whether local or national. So what's the go with Radiogram — why should we care?

It's hard to say, though one thing in its favour is that it has a very tidy and easy-to-use interface. With the likes of TuneIn, it can sometimes be hard to tell whether a search result is a radio station, a radio show or a podcast, but there's no such ambiguity here.

While the free version of TuneIn offers over 100,000 radio stations, Radiogram only boasts "thousands", but it's still surprising to find, for example, the local Ballarat FM station within that comparatively small pool.

For its UI and its clear genre-centric search options, it couldn't hurt to use this if app if you've yet to attach yourself to any competitors. It supports Google Chromecast and is, mercifully, display ad free.
[SHAUN PRESCOTT]

3½
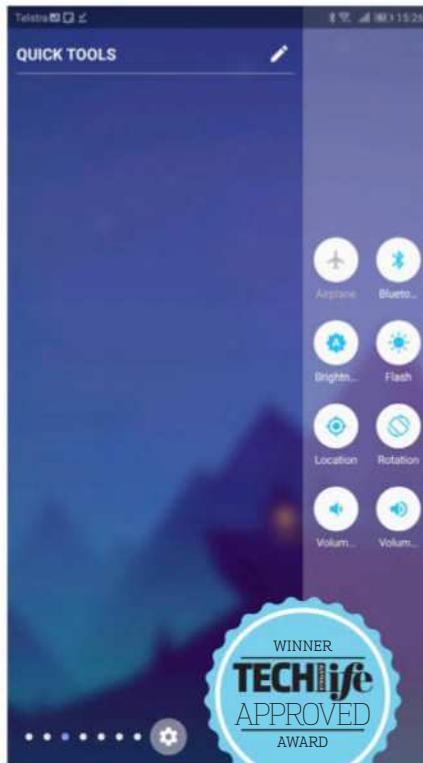
Edge Action

CHOICE (SHORT)CUTS
Free with IAP | tinyurl.com/tla77-edge

Eyeing off the fancy Samsung Galaxy S9 with its fancypants edge panel swipe system? Well, close your cycloptic eye, there's an app that'll achieve the same result. Simply swipe from the very edge of your Android's screen with Edge Action and a shortcut panel appears, overlaying the rest of your screen.

It's actually seven shortcuts in one, from most frequent contacts to your favourite apps, quick tools, calendar and more. There are some superfluous functions in there, like the quick tools — Bluetooth toggle, airplane mode and so on — which you can find by swiping down from the top of your screen, and since there are seven shortcut panels, it's probably quicker to simply go into your app drawer and choose what you want from there.

The free version is unobtrusive with ads limited to the settings menu, but you can remove them entirely for $3.09. You can also buy more shortcut pages to take screenshots and play music, but they seem totally frivolous. It's a lightweight, stylish app that offers functions from a high-end phone for zero dollars, so there's a lot to like.
[PAUL TAYLOR]

4
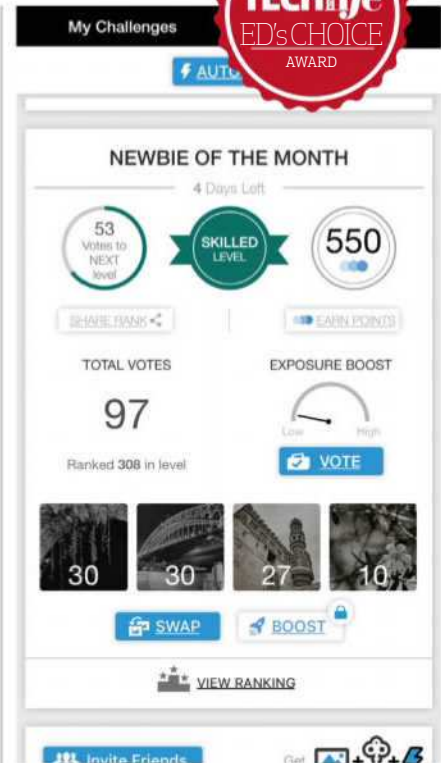
GuruShots

UP YOUR PHOTOGRAPHY GAME.
Free with IAP | gurushots.com

If you want a platform to hone your photography skills, GuruShots can help. While the photography social site has been on Android for a while, the iOS app is new. The premise of GuruShots is to help budding talent learn by pitting themselves against each other in themed competitions. There are plenty of comps running at the same time and each is proposed by an award-winning photographer, or Guru, who takes the time to mentor entrants.

The app is easy to use: download, create an account (you can sign up with Facebook or Instagram), upload photos and wait for all the Likes and comments to flow in. All new users are automatically entered into the Newbie of the Month competition and every vote your images receive increases your 'ability level'. You can gain followers, follow others and vote for your favourite images.

The app is free to use but purchases can be made to help you get ahead in competitions, like buying the ability to "swap" an entry for another. It's pretty much everything a photography social network really ought to be, and then some. [SHARMISHTA SARKAR]

4½

SWEAT DECK
A CARD-BASED FITNESS AID THAT GAMBIT WOULD LOVE.
Free; $4.49 Pro | www.rubbledev.com

It's not always easy knowing which exercises to pick without some sort of help from a personal trainer. There are a million different apps out there that can aid you in this respect, so what makes Sweat Deck stand out?

This app gamifies your workout by throwing cards at you (well, they appear on the screen), and you're tasked with doing the exercise and number of reps on the card. Exercises are linked to suits, so you could put squats on diamonds, chair-dips on clubs, burpees on hearts (we hate burpees, too) and maybe some leg raises on spades. It's best to balance out your workout, or else you may end up doing 10 push-ups, followed by 10 burpees, followed by a minute of planking, followed by severe pain in your arms!

The design of this app couldn't be any simpler or easy to navigate. It's easy to hit done on your current exercise and move to the next and all your stats are clearly shown post-workout for you to peruse. You can get the exercises read out to you, which we highly recommend, and look out for those Joker cards that are randomly distributed for a surprise challenge!

Upgrading to Pro isn't necessary but it does offer some great additional features, such as a wider variety of exercises to choose from, more customisation options, a timer for your workouts, as well as history view and the ability to save custom workouts. In all, it's a refreshing way to get sweaty. **[CARMEL SEALEY]**

4½
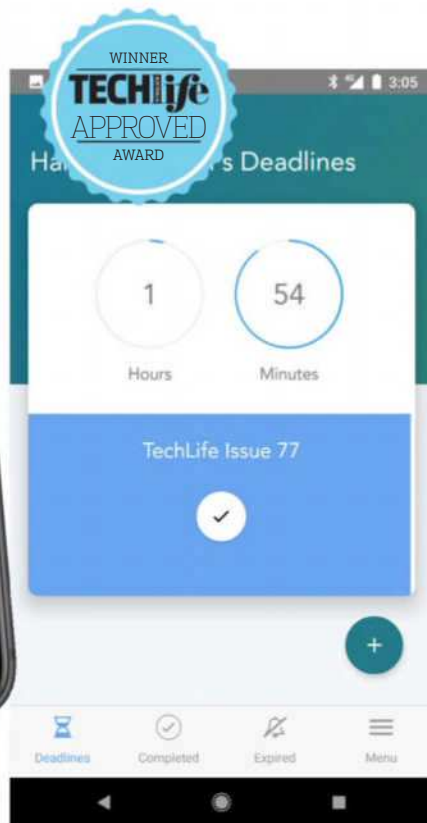
Timebound
KEEP YOUR DEADLINES (AND EDITOR) FROM KILLING YOU.
Free | timebound.org

For those who manage multiple projects with multiple deadlines and find to-do lists a little too soft and unfocused, Timebound is a really neat solution. While it functions much like a calendar with reminders, the tidiness of the app's interface makes for an incredibly immediate experience for when you want to rapidly check in on the progress of your deadlines.

You can either register an account with Timebound or log in via Google or Facebook in order to kick things off. Once you're in, creating and managing deadlines is very similar to Google's Calendar events — enter a title, date and time for your deadline, and then set up any notes or reminders you'd like for it along the way. The way they're displayed, however, is much more focused, with each project receiving a big countdown clock on the main page, and the other tabs allowing you to view completed or expired deadlines.

Timebound will sync across any of your mobile devices and will adapt to different time zones so you can check on progress no matter where you are. No more excuses!
[HARRY DOMANSKI]

4
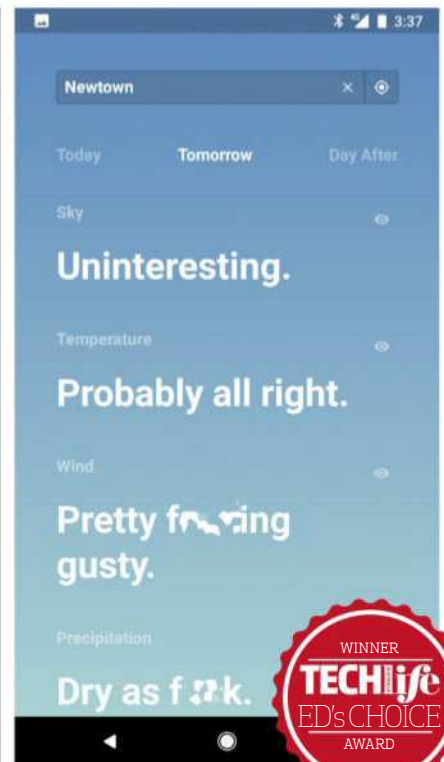
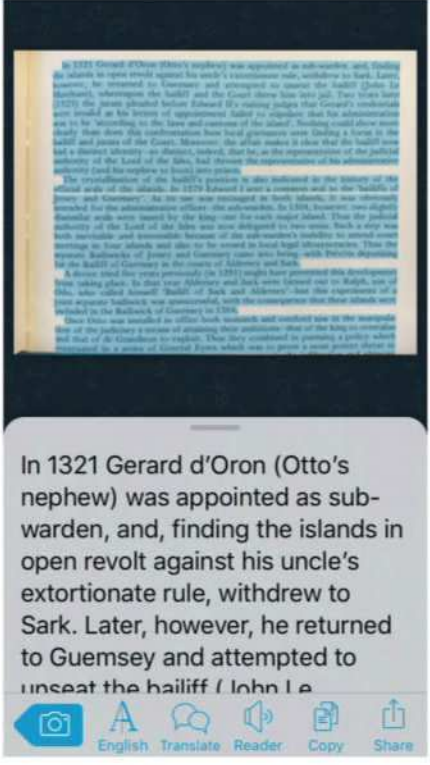### TFW (The F***ing Weather)
Free | alcohollick.com/tfw

Are you sick of weather apps that pretend to give you hyper-accurate results, only for the decimal precision in the temperature to be off by a solid 10 degrees? Tired of an alleged 7% chance of precipitation resulting in a downpour that floods your very soul?

TFW aims to be "the most vague weather app available today", but in reality, it's a refreshing towel to the face of information saturation. The service uses data from openweathermap and then smooshes it down to some relatively vague statements about what today, tomorrow and the following day's weather will look like in your area or an area of your choice.

Expect such statements as "like the f***ing Sahara" when there's not much chance of rain, "pretty f***ing vanilla" if it isn't especially hot or cold, and "enough wind to be s***" when there's enough wind... well, you get the idea. While there might not be an integrated widget, an option to save multiple locations, or even an in-app menu, the simplicity and brutality of this app is exactly what an amateur meteorologist needs.
[HARRY DOMANSKI]

5

WINNER
TECHlife
APPROVED
AWARD

Prizmo Go
CAPTURE EDITABLE TEXT ON THE GO.
Free with IAP | creaceed.com

Focos
TAKE CONTROL OF DEPTH AND BOKEH.
Free with IAP | focos.me

ARTSTUDIO PRO
AFFORDABLE PAINTING APP FOR IPADS.
$17.99 | luckyclan.com

Prizmo Go promises optical character recognition (OCR) on the go. Take a picture of a page and it translates any text it sees into editable characters. Typed text recognition was excellent in our tests. Although it made the occasional slip-up if the page was glossy, it was spot on in even illumination.

After coughing up an in-app purchase, the app lets you export more than the first few words and also gives you ten credits for cloud OCR, which increases the number of recognised languages from 23 to 26. If you're using Prizmo Go as a research tool, it's well worth the money — as one-off payments for credits or for a subscription.

The big news in this release is handwriting recognition, which requires one cloud credit per scan. It didn't do well in our tests. We tried a variety of different people's handwriting, all in English. Some, it got partially correct but it thought one was Arabic and another was Chinese, the latter of which it translated into just three characters. Unfortunately, there's no way to tell it that it's made a mistake before it cashes one of your credits. A mixed bag, then.
[NIK RAWLINSON]

Apple's dual-lens iPhones are able to use the Camera app's Portrait mode and create DSLR-style depth effects. Focos gives you much more control over depth-editing. You can take photos using the app or open pictures that were shot in Portrait mode, then tap on the background or foreground to refocus on that area. Note that basic features work in free mode, but you need to unlock advanced ones ($1.49 a month, $9.99 a year, or $14.99 lifetime).

Editing tools start with simple crop and rotate. An Aperture section enables you to change the virtual aperture size. A second control, bokeh shape, lets you choose custom shapes for the bokeh effect. The Highlights and Vivid sections provide sliders to alter the lighting and colour intensity of a selected area, and the Lenses presets let you simulate the apertures of several real-life lenses, though the differences are quite small. In a final Effects section, you can drag a slider to spin the image around in 3D to see how the depth map breaks down. You can also add motion blur, tilt shift, and more creative effects.

Features could be signposted more clearly, but it's still a powerful tool. [HOLLIN JONES]

Some iPad art apps are dedicated painting apps, while others are photo editors with painting tools. Artstudio Pro is both. The Adjust and Filters menus are reminiscent of Photoshop, there's a proper Layers palette, and the toolbox down the left-hand side includes image editing essentials such as selection Lasso, Clone Stamp, Sharpen, Dodge and Burn.

Tap the paintbrush icon, though, and you have a full range of inks, pencils, chalks, and paints, which can be supplemented by importing brushes. Even better, the slider icon at the top right of the Brush Editor gives you detailed control over the look and behaviour of each brush, including dynamic response to pressure when you're using the Apple Pencil, or to velocity when painting with your finger. The results impress.

Artstudio Pro also has a Mac version ($62.99). Thanks to iCloud, you can make a new file at your desk and start painting, then pick up your iPad. The catch is that your custom brushes don't sync, until you export and import them. We found the Mac-like design of the iPad version less than helpful, though. If you want one app for everything, don't need advanced retouching tools, and are prepared to learn an idiosyncratic interface, Artstudio Pro is decent value — if a little awkward in use. [ADAM BANKS]

3½

4

3½

[EXTENSIONS TO ENHANCE YOUR WEB EXPERIENCE]

Browse better

THE *TECHLIFE* TEAM DIGS UP THE BEST NEW BROWSER EXTENSIONS FOR CHROME, FIREFOX AND MICROSOFT EDGE.

[SHARMISHTA SARKAR]

[FOXY!]
Chrome Store Foxified
BEST OF BOTH WORLDS.
Free | tinyurl.com/tla77-foxified

IF FIREFOX IS your browser of choice but you dearly wish you could use a certain Chrome or Opera add-on, we've got you covered. Chrome Store Foxified allows users to install Chrome or Opera plugin to Firefox directly from the Chrome Store or the Opera Add-on Website. As handy as this tool is, it must be noted that not all Chrome and Opera browser extensions will work on Firefox, but most do. The other handicap is that any updates made to the plugins will not be automatically added to Firefox. To enable updates, you'll need to remove the plugin from Firefox and reinstall again, or keep an eye out for when the addon becomes available on Mozilla's add-on store. While this can be a bother, for people who prefer Firefox's security but want access to Chrome's vast storehouse of plugins, it's a great way to get the best of both worlds.

+

CHROME STORE FOXIFIED ALLOWS USERS TO INSTALL CHROME OR OPERA PLUGIN TO FIREFOX DIRECTLY FROM THE CHROME STORE OR THE OPERA ADD-ON WEBSITE.
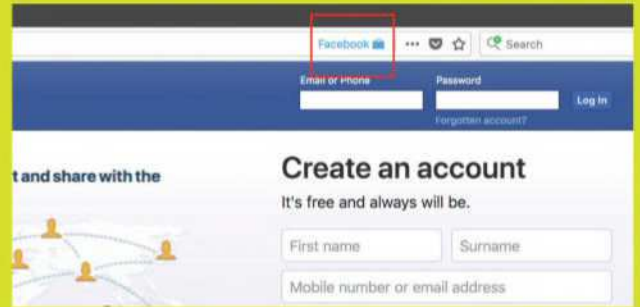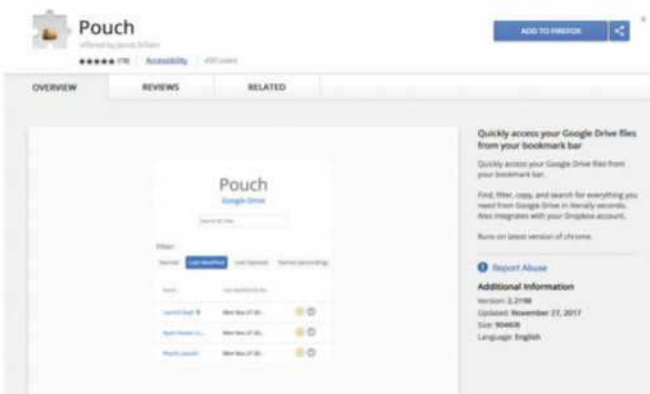
[STEALTH MODE]
FACEBOOK CONTAINER
KEEP YOUR PRIVATE FACEBOOK LIFE PRIVATE.
Free | tinyurl.com/tla77-facebook

Mozilla has responded to the Cambridge Analytica scandal by releasing a Firefox extension that helps keep your data safe by essentially hiding a Facebook user's identity when they're browsing other sites. Once installed, the add-on deletes all Facebook cookies and login details. The next time you log into your Facebook account, the social media site will open in blue 'container' tab. From there, if you click on a third-party link, the page opens in a different tab. If, however, you use the Facebook Share button on the new page, it will open in the container tab. It is also important to note that, as a precaution, Firefox users installing the plugin will not be able to log in to websites and services using their Facebook accounts. This feature is meant to restrict Facebook's access to information on user activity outside of the social network. That said, Mozilla wants users to know that it will not be collecting any data from the Facebook Container extension.
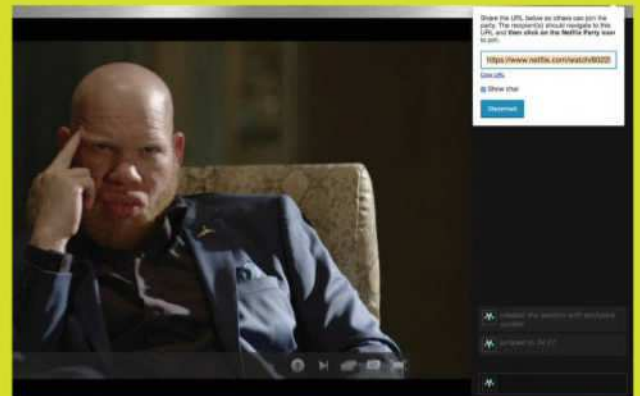
['NSYNC]
NETFLIX PARTY
GET BINGE STARTED WITH FRIENDS, FROM ANYWHERE.
Free | www.netflixparty.com

If you have a movie night planned with your pals but you won't be able to make it to the party in person, you can still join in, provided the movie is on Netflix. A new Chrome extension allows you to sync your movie-watching or binge sessions with friends and family when you can't be with them.

The plugin is easy to use — install, open Netflix, click on the video you're watching with the others, then click the plugin's icon on the toolbar. It gives you a shareable link which you can pass on to anyone joining the Netflix binge. Everyone must be watching the streaming service through the browser, though. And that's all you need to get the party started. Well, maybe a bowl of popcorn, too. Netflix Party also has a chat bar, so you can slag off the latest episode of *Shadow Hunters* together or swoon over the makeovers in *Queer Eye*. There was a time when Xbox users could set up a Netflix party across the world, but that service was pulled a while back. This Chrome plugin, however, puts the party within anyone's reach. So go on, strengthen that long-distance relationship with Netflix Party. ∎

Site insight

<mark>OUR MONTHLY ROUND-UP OF THE WEB'S MOST ILLUMINATING, USEFUL OR JUST-PLAIN-COOL WEBSITES.</mark>

[HARRY DOMANSKI]

Outrider on Nuclear Weapons
NEATLY INFORMING THE PUBLIC OF THE BIG ISSUES.
outrider.org/nuclear-weapons

Outrider is a relatively fresh website with a noble goal: in their own words, the team "believes in the power of an educated, engaged public". As such, they hope to provide this education by presenting information in an engaging way, while suggesting genuine options on how to act on the world's big issues — starting with nuclear weapons. Through an interactive map, you can use your GPS location or plug in a suburb or city, and see just what kind of damage would occur if one were to be detonated there. This demonstration offers information on fatalities, injuries, and the radii of fallout spread, heatblast and more, as well as allowing you to modify the type of bomb and other attributes to see how it will influence the outcome. Beyond the alarming interactive component, there's tons of information on the immediate and long-term hazards of nuclear weapons, as well as some brilliantly-written articles on current and historical threats. Most importantly, the site offers some realistic calls to action about what can be done by the individual on the issue, and with Outrider working on a Climate Change feature next, we're optimistic.

Gnoosic
QUICKLY FIND SOME NEW TUNES.
gnoosic.com

There are so many music-seeking services and algorithms at this point that it can get a little bit hectic and tedious to keep track, but Gnoosic aims to calm it all down. Perhaps the biggest appeal of this service is its immediacy and simplicity — as far as user input is concerned, you simply need to pick three artists that you like and are seeking similar music to, and click each suggestion with a rating. With each result, either select 'I like it', 'I don't like it' or 'I don't know' in order to progress to the next result. Because the system is self-adapting, these answers will help continue to train it, expanding its knowledge and accuracy when predicting music you'll like. There are no frills on this site, so don't expect embedded media players or social media sharing buttons or anything. It is a tool, pure and simple, and frankly... we find that refreshing.

Print Friendly
TURN A WEBSITE INTO A PDF OR MAKE IT PRINTABLE.
printfriendly.com

Before you go ahead and hit 'print page' on that recipe or how-to article, save yourself the wasted paper on giant headings, links, irrelevant images and advertisements by checking out this neat online tool. Simply plug in the URL of the site you'd like to print and hit preview, and you'll be taken to a pared-back version of the page with just its text and images. From here, you can delete any blocks of text or image that you're not interested in and change the text or image sizes to tidy the whole page up. Once you've applied the requisite polish, you can either open up the printing menu, save the document as a PDF, or email it straight from the page. From the homepage, Print Friendly also offers a browser extension so you can make the process even more immediate, or if you're a web developer, there's an option to add a Print Friendly button to your web page for others to use. ■

"Look pal, I only deal in severed heads, and it is a Norse-ty business."

[PC AND CONSOLE GAMES]

Axe to grind

THE *TECHLIFE* TEAM REVIEWS THE LATEST GAMES FOR PC AND CONSOLES, BEGINNING WITH THE RETURN OF KRATOS.

God of War

KRATOS IS GREAT AT RAISING HELL, BUT CAN HE RAISE A SON?

$94.95 | PS4 | playstation.com/godofwar

IT'S BEEN MANY years since Kratos exacted bloody vengeance on the Gods of Olympus for tricking him into murdering his own family, and he's changed in quite a dramatic way. The Spartan warrior has left Ancient Greece behind and is now living a peaceful life with new family in the Norse realm of gods and monsters.

But it's not just the Norse mythology setting that sets the new *God of War* apart from previous entries in the series — its action-focused gameplay has been completely deconstructed and reimagined, offering a new over-the-shoulder camera perspective and an axe-based combat system that keeps Kratos mostly grounded. He's also got a companion along for his latest adventure, with his young son Atreus providing backup with his trusty bow and knife during combat, while also deciphering Norse text and helping out with puzzles. This father and son duo is bound to draw comparisons to Joel and Ellie from Naughty Dog's 2013 masterpiece, *The Last of Us*. It displays a maturation of character and tone that helps take the series to new emotional levels, making for a deeper, more satisfying overall experience.

Perhaps inspired by the likes of *Dark Souls* and *Bloodborne*, the new combat system's quick and heavy attacks are mapped to the shoulder buttons, with added functionality, like axe-throwing. Aiming at an enemy and pressing square will also cause Atreus to shoot arrows for you — an invaluable tactic later in the game when the bow is powered up with numerous magical abilities. Thankfully, though occasionally tough, the combat is much more accessible than it is in the *Souls* games; this is still a *God of War* title at heart.

In stark contrast to the mostly-linear nature of previous *God of War* games, this iteration takes a page out of the *Tomb Raider* reboot playbook, giving you a much larger environment to move around in without going all the way into sandbox territory. In true 'Metroidvania' fashion, certain areas, items and pathways are initially blocked off to Kratos and son, opening up only after you've unlocked the requisite new ability or weapon which allows you to break through previously unbreakable barriers.

The new *God of War* isn't just the best game in the series because of its redesigned combat system, updated camera, epic scope and incredible visuals. It reaches incredible new heights because of the inclusion of something that none of the previous titles really had much of — heart. [STEPHEN LAMBRECHTS]

5

WINNER
TECHlife
ED's CHOICE
AWARD

Kratos and Atreus enjoy a relaxing canoe ride.

A typical deadline day at TechLife Towers.

WINNER
TECHlife
APPROVED
AWARD

Far Cry 5

TAKING DOWN A CULT, ONE POORLY-AIMED ROCKET AT A TIME.

$99.95 | PC, PS4, XO | far-cry.ubisoft.com

ON A BRIDGE over a river in Hope County, Montana, your reviewer is in a fierce battle with a roadblock set up by doomsday cultists. Civilians are running scared, their cars graffitied with the word 'SINNER'. The cult are extremely well-armed and well organised, led by the enigmatic John Seed, a self-proclaimed prophet who's brainwashed his flock through fear and a potent drug. He's in hiding, having resisted arrest for taking people against their will, and his three lieutenants — essentially the bosses who you have to antagonise in order to get to Seed — are now leading on his behalf.

Which brings us to the bridge. It's a tense scene, but this being *Far Cry,* it's also not completely steeped in seriousness and tragedy. We're mopping up two ute loads of goons when a third comes skittling onto the scene, along with a bear that had been chasing who knows what, and another terrified civilian from the other side. Our gun-for-hire, a redneck called Hurk Drubman (who should be familiar to anyone who played *Far Cry 3* and *4*), neatly lines up the centre vehicle with his RPG. He sets off a chain reaction which totals everything from cultists to civilians, and really upsets the bear which is now on fire. We decide to embrace the fiasco, necking a homemade homeopathic for extra strength, punching the bear to death for its skin, then jumping off the bridge, triggering a wingsuit and gliding into the nearest town to sell the skin for $100. We spend the money on a lurid paint job for our shotgun.

Far Cry 5 is, without a doubt, the most polished *Far Cry* ever. Hope County is enormous, a mountainous playground littered with vehicles to commandeer, planes and helicopters to fly, and the improved graphics engine gives everything weight and, believe it or not, a sense of realism. The freeform nature of it all perhaps offers too much freedom, scuppering depth that the story might provide, but then again, it's the bits between the story that have always been the most fun — tonal consistency be damned.

The map is yours to explore after a short introduction — the world's inhabitants waiting to be stumbled upon. This time around, you no longer need to skin five animals to fashion a bigger wallet or better ammo pouch, nor go through torturous 3D platforming and climb towers to reveal new locations. Perk points, earned by completing missions or finding collectibles scattered in the world, are your new currency. Characters will allude to breadcrumbs that point you in the right direction to get more of these, but there's the right amount of hand-holding and discovery in the sandbox so that you're never hemmed in.

However, like a lot of Ubisoft titles, your screen will be overrun by icons and waypoints that hover on the edge, a distracting swarm that nags of what you haven't yet done. Or you can sack the whole thing off and sink all your time into Far Cry Arcade, the map editor that also tosses in structures from *Assassin's Creed* and *Watch Dogs.* The community has already made some remarkable maps, and it's this that will give the game life beyond its 30-hour run time.

[**PAUL TAYLOR**]

4

The wingsuit makes a glorious return.

CHUCHEL

AAAAARGH!

US$10 | PC | chuchel.net

Chuchel is pure mania. Every moment is biarre, hilarious and you have no idea how you're going to explain any of it to anyone. Essentially a point-and-click puzzle game, it mixes things up with sheer absurdism. You play as the titular Chuchel, a ball of black fluff with arms and legs but — most importantly — one big, loud mouth. It's the sounds he makes that define this little character and make him such a pleasure to be around. Furious yells and self-satisfied chuckles are his trademark, never failing to put a smile on your face. The sound design is exquisite; from the music to sound effects, the entire game bounces with energy in a way few others manage.

The minimalist world has a scratchy, hand-drawn feel that perfectly matches the off-beat jokes and gags. Strange, illogical creatures inhabit a world composed of random but otherwise mundane objects. There's something childlike about it all, every puzzle and character adhering to its own logic.

Chuchel is perpetually furious because a giant hand has taken his favourite cherry and refuses to give it back. The game follows a series of puzzles and setpieces as the creature tries to retrieve his prize fruit, all while competing with his rival (a little pink rat). Puzzles are seldom especially difficult; mostly they're there to make you laugh. Sometimes, all you have to do is click on an object, such as one sequence that presents you with a mysterious switch. You have to press it to progress, but you just know something bad is going to happen to Chuchel, who is all too eager to press the button himself. It's from this dissonance between the player's foresight and the hero's recklessness that much of the humour springs. We see mistakes ahead of our little friend, but he's just all too eager to throw himself into one problem after another. Adorable.

Comedy is rare in videogames, and comedy that actually lands all the rarer, but Chuchel's eccentric nature is always truly hilarious.

[SAM GREER]

4½

It's a good feeling to blast your balls into another pirate's hold.

Sea of Thieves

AN OCEAN OF SALTY GAMING TEARS.

PC, XO | $99.95 | www.seaofthieves.com

WE'VE BEEN RUNNING up and down two flights of creaky stairs on this galley for the last 10 minutes. There's a storm raging overhead and if somebody doesn't drain the hold, one small bucket at a time, she'll sink. Voice chat crackles: our mate is repeating something about "looking for three skulls facing east", while another scans the horizon for sails from the crow's nest. "Argh, I've just been struck by lightning!" he squawks a few seconds later. But we no longer care, as we continue to heave into our dizzying, soul-destroying bucket-work. We don't know if we're having fun.

Sea of Thieves is an open-world shared-adventure game from Microsoft Studios. Players — from both PC and Xbox One — assume the role of pirates in an online, flooded world in search of treasure, fame and a new pair of pants. There are three main factions players can run 'voyages' for — variations of the staple RPG fetch-quest. You're given a ship — a small sloop for one or two players, or a large galleon for three or more — a compass and a heading. Navigating around the sea is fun the first few times you do it. Each ship features a map room where you plot course and get a compass direction. Navigating involves raising the anchor, checking wind direction and lowering/angling the sails. When the cartoon-piracy gets dangerous, ships come furnished with hefty cannons and players are equipped with a cutlass and hand-cannon. Combat is a simplistic hack-and-slash affair, and any real fun is heavily reliant on the unpredictable nature of random encounters with other players. A simple voyage can take from 10 mins to more than an hour. Ideally, rewards should reflect that effort — but sadly, they don't. Pirating earns you gold, which you can use to buy cosmetic appearances for your gear, but there's no *meaningful* progression. The economy — and the will to continue playing — comes under scrutiny when it takes three gaming sessions to earn some fancier pants. There needs to be a more compelling reason to leave the pub you spawn into. [TROY COLEMAN]

3

"Four paces east, then nine paces south, before two paces east..."

Studio Ghibli isn't responsible for cut scenes this time around — the game is still lovely looking, though.

Combat is simplistic compared to the first *Ni No Kuni*, but it's still a lot of fun.

Ni No Kuni 2: Revenant Kingdom

A MASSIVE JRPG DESIGNED FOR NEWCOMERS TO THE GENRE.

$99.95 | PC, PS4 | www.bandainamcoent.com/games/ni-no-kuni-ii

WHEN IT RELEASED in Australia back in 2013, *Ni No Kuni: Wrath of the White Witch* represented a rare, mainstream moment for JRPGs, receiving the kind of attention normally reserved for *Final Fantasy* games. The reason was its pedigree: while its status as a new Level-5 game was only of interest to die hards, Studio Ghibli's attachment to the project was key. The studio is, after all, best known as the animation crew responsible for *My Neighbor Totoro*, *Spirited Away* and more. It was like a match made in heaven.

But *Ni No Kuni 2: Revenant Kingdom* can't lay claim to any Studio Ghibli association, so its arrival feels muted. Perhaps to compensate for this, Level-5 has transformed the *Ni No Kuni* series from a prickly turn-based JRPG into... a game that basically tries its hand at everything, with its sights fixed firmly on a more casual audience. The turn-based combat is gone, replaced with a simplistic but nonetheless fun live-action system with the usual light / heavy attack and stamina management formula.

And that's not all: the game's typically grandiose JRPG formula is augmented by a kingdom building element, which proves a lot more complicated and feature-heavy than you might expect.

This dovetails with the plot: you play as Roland, who has witnessed the destruction of a city and, afterwards, is whisked away, transformed and tasked with rebuilding a (much more whimsical) fantasy kingdom. It's a JRPG, so the story is several orders of magnitude more complicated and bloated than that, but the setting is gripping enough to carry you through what is, at heart, a fairly breezy game.

Because it's true: *Ni No Kuni* appealed to JRPG fanatics, whereas its sequel wants to appeal to everyone. Those seeking a stiff challenge may be disappointed, but the game is beautiful and charming enough to compensate for its easiness, even if by the halfway point it reveals itself as a confection, rather than a hearty JRPG meal.

[SHAUN PRESCOTT]

3½
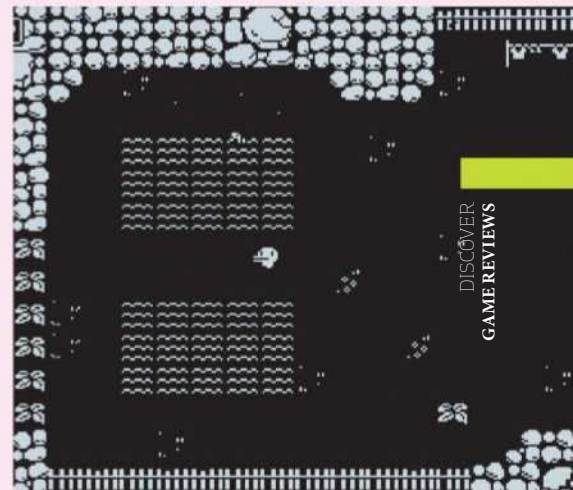
MINIT

A CUTE, CRUEL ADVENTURE.

$15 | PC, PS4, XO | www.minitgame.com

No matter what you're doing in *Minit*, no matter where you are, you will drop dead every 60 seconds. Life in this *Legend of Zelda*-inspired adventure is fleeting, and you only have a minute at a time to solve its puzzles, talk to its characters and complete its quests. A timer at the top of the screen ticks those 60 seconds down relentlessly, and you are at its mercy. That all sounds very dramatic, but *Minit* isn't completely sadistic. Some of the items you find will carry over to your next life, opening up more areas to explore. And as you traverse the world, you'll find houses that will act as respawn points. So with every life, you'll make a little more progress and explore a little further, until you lift the curse and end your temporal torment.

Although it has the look and feel of an early *Zelda* game, *Minit* is really a series of puzzles. The nameless protagonist finds items fairly regularly, granting them a variety of powers. With every item found, another obstacle can be bypassed, and you repeat this cycle until every corner of the map is accessible.

You will die in the process, a lot, but not just at the hands of the timer or the enemies roaming the map. You can actually kill yourself at the tap of a button. If you know you won't be able to complete a task or reach your destination in time, it's often easier to just hit the death key, respawn back at your house, and try again. Death becomes little more than a minor inconvenience to you. Minit has no real stakes, which cheapens the timer system and makes it feel somewhat arbitrary. We left the game thinking the concept was more interesting than the execution.

These reservations aside, we had a lot of fun. We love the art, which squeezes a lot of personality into just a few black-and-white pixels. The dialogue is endearingly silly, and some of the puzzles were satisfying to solve. The death timer is arguably more of a novelty than anything else, but it does make for a unique, if occasionally frustrating, experience.

[ANDY KELLY]

3½

[MOBILE GAMES]

Partners in time
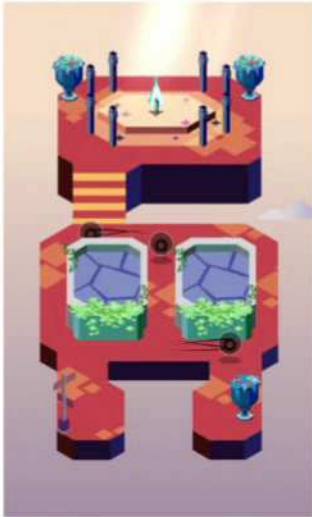
Umiro
CRYSTAL, CLEAR.
From $4.19 | dicerollstudios.com/umiro

WHAT A MIND bender. Two chums — Huey and Satura (names you'll forget two minutes after meeting them) — are lost in a dream world and must retrieve their memories. That's the thin plot behind this journey as you guide them to checkpoints in each stage, collecting crystals on the way while avoiding traps and opening gates.

Ignore the premise completely and you'll still have a good, if tough, time figuring out how to get to each stage's end gate in one piece. *Umiro* starts out easily enough, as you trace a line from one character, through the collectible and then to the end, though the difficultly quickly ramps up once the second lost soul is involved and multiple traps impede your progress. After drawing a line from Huey to the end gate, you'll see where he's at on the map in relation to Satura — useful, as she might have to shut down some deadly mist for Huey by walking over a button, only to have it reactivated so that another vent switches off. Hit play on your plan and your characters are off, and if one touches a nasty, both die.

This is where Umiro starts to come unstuck, as you're relying a lot on trial and error to time your zigzags through traps, and it's not always easy to see where you might be going wrong thanks to the perspective. That's a slight shame, as the art style is glorious. Once they're walking on your route, there's no stopping them. Fail, and you may need to create a slight deviation or squiggly circle to let a floating orb of death cruise past. At other times your plan will need a total rewrite.

Thankfully, any demise is temporary, the load times short, and each stage is contained to one screen. Anyone who's played the venerable *Hitman GO* or the fairly ancient *Droidscape* will see shadows of both here, though *Umiro*'s antics are far more real-time than those two.

While it can be frustrating, *Umiro* is still rewarding. Best played in short bouts (it's over in a couple of hours if you really fly through it), you'll enjoy this tough but stylish puzzler.
[PAUL TAYLOR]

3½

Magic Rampage
A JOYOUSLY FOCUSED AND POLISHED RPG PLATFORMER.
Free with IAP | magicrampage.com

MAGIC RAMPAGE DEFTLY balances the best elements of action, platforming and RPG gameplay to create a surprisingly compelling experience, despite occasionally suffering from an illusion of choice. Most of your time will be spent running, jumping and firing projectiles in a series of side-scrolling levels that span dungeons, swamps, volcanoes and similarly elemental realms. While the action is real-time, all of the weapons (swords, axes, magic staves) are ranged and fly slowly and horizontally, requiring a certain knack to master them. The control scheme consists of a phone-friendly left, right, jump and attack, and on the relatively small screen of the Pixel 2, it rarely feels restrictive.

Before setting out on your rampageous adventure, you'll get to choose from the 10 available classes and each will naturally have their own buffs and specialities. You can even customise a small amount of cosmetics, but the most significant point of difference is easily your character's special ability. Ranging from summoning spiders to slowing time and throwing hammers, these abilities can seriously save your bacon, but will have to be unlocked as you progress.

Aside from an increasingly interesting and difficult cast of enemies, you'll encounter a menagerie of traps, puzzles, collectibles and loot drops — the bread and butter of RPGs. While for the most part, each introduced mechanic keeps the gameplay fresh, the variety of weapons, armour and classes aren't quite varied enough to offer distinctly unique playing styles between classes and weapons, and the best items were often the same between classes.

Surprisingly, the narrative is compelling and cohesive, despite the game giving off the impression of relatively mindless fun, and it's encouraging enough to play through the story at least one more time. At the time of writing, *Magic Rampage* offers 40 levels with an engaging difficulty curve, each of which are an ideal length for satisfying your platforming itch in those brief moments of downtime on public transport or waiting in line. [HARRY DOMANSKI]

4½
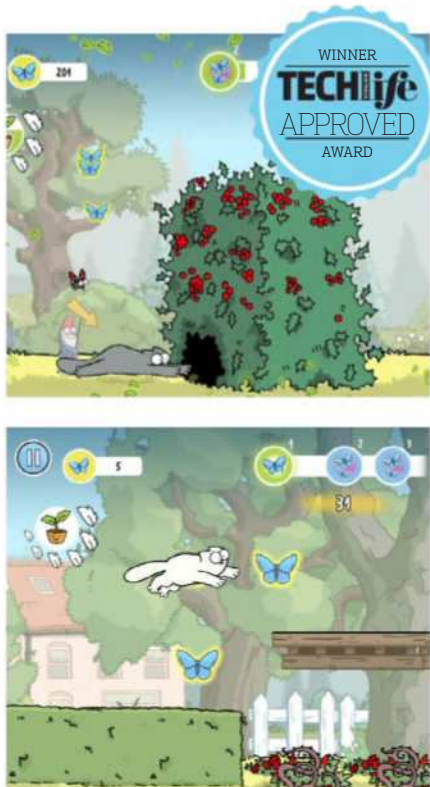
Simon's Cat Dash
AN ENDLESS RUNNER FULL OF CHARM.
Free with IAP | goodcatchgames.com

THIS HAS TO be the biggest garden in the history of the world, populated by all the butterflies who have ever lived. *Simon's Cat* has a special place in this reviewer's heart (mainly because it features a cat), and after rather enjoying the previous game featuring the titular white feline and his menagerie of friends, we were eager to play this one. Sadly, this reviewer isn't as good at endless runners as she is at drawing lines through similar fish-shaped treats to feed impatient, hungry cats. But that's a reflection of our individual skill and not the game. The game itself is gorgeous and animated beautifully. You play as Simon's Cat himself as he leaps, slides, bounds and runs through the endless garden, collecting butterflies for his girlfriend Chloe (who will presumably eat them and not return his affections, as per usual). Along the way, you will hopefully not bump into anything or jump on rose thorns, which halts your runthrough. While some of the surfaces are a bit tricky to spot against the background (columns, for instance), it's just a matter of getting used to what you can and can't jump on and mastering your reaction time. There are new playable cat characters to unlock, challenges and collectibles, so if you like endless runners, there's enough here to keep you interested for a while. [CARMEL SEALEY]

4

Gorogoa
SOLVE MINIATURE MYSTERIES THROUGH BEAUTIFUL ARTWORK
$7.99 | gorogoa.com

EVERY NOW AND again, a puzzle game comes along that changes what puzzle games can be. *Gorogoa* is one of those games. It's a puzzle game, storybook, comic book and painting. There are four square panels, which you can move around and overlap at will. Sometimes, one of these panels will have a doorway, and by moving the panel with the doorway and lining it up with a doorway in another panel, you can create paths through different worlds. Other times, there will be a lantern, and the goal is to find something to layer behind the lantern to make it light up; or perhaps it's a stained glass window missing its interior. As you play, you're always on the lookout for matching patterns, secret doors, details, and things-that-look-like-other-things, such as a cogwheel and a sun. It's not an easy game to figure out, especially when it gets to the later stages and there are more than four scenes to sort through. But it never feels like you're properly stuck.

The art is all hand-drawn by the developer, Jason Roberts. That's what gives it the look of a storybook — that, and the repeated motifs of intricate symmetry and Islamic-inspired patterns that make *Gorogoa* look like an old religious text. It's not surprising that it was seven years in the making. What is surprising is that it feels like it's always existed. [KATE GRAY]

5

AR Smash Tanks
TANKS FOR THE MEMORIES.
$2.99 | dumplingdesign.com

SMASH TANKS CONNECTS the dots between the dawn of home videogaming and today's cutting-edge technology. The basic premise — blow up the enemy's tanks — echoes *Combat*, which appeared back in 1977 on the Atari 2600. Fortunately, *Combat* was loads of fun. Even better, the execution in *Smash Tanks* is superb, fully taking advantage of AR and iOS touchscreens. Matches are turn-based, with you using your trio of tanks as slingshots, to take out your opponent's army. Controls are simple: drag back to aim/set your power level, and then let go. Sporadic weapon drops add to the chaos, providing temporary shields for whoever grabs them or the means to rain down missiles on a hapless opponent.

Despite the immediacy of *Smash Tanks,* there's strategy lurking within. Environments are destructible, meaning you can, in theory, topple towers onto your enemy. And those power-ups require collection, but collecting them can leave you exposed. However, you can also activate a powered-up tank by hitting it with another. So lob the AR side of things into the mix, and you end up with a surreal pool-like take on *Combat*, in AR arenas that can be resized to fit anything from a coffee table to a garden.

The only downsides are a poor single-player mode (the AI is dumb) and no online multiplayer. [CRAIG GRANNELL]

4

TEST BENCH

THE HOTTEST GEAR PRESSURE-TESTED

WINNER TECHlife ED's CHOICE AWARD

Apple iPad 9.7 (2018)

THE MOST AFFORDABLE IPAD EVER BRINGS SOME BRILLIANT UPGRADES.

THE NEW IPAD for 2018 is designed to deliver the best of Apple's tablet efforts at a more affordable price. The cost is still higher than many other tablets out there — but the new upgrades bridge the gap between a 'standard' slate and the more impressive iPad Pro range.

It comes with a range of storage and connectivity options, with prices starting at $469 for the 32GB Wi-Fi model, and the equivalent cellular version adding $200.

In the looks department, the metal back, the well-machined buttons, the home button at the base of the tablet with TouchID integration are all present and correct. The screen is bright, with a resolution of 1,536 x 2,048 pixels, at 264ppi. It's a shame not to see HDR or OLED supported, but Apple is trying to keep the costs down. Everything still looks crisp and sharp, with colours well reproduced.

It's tough to work out whether the Apple Pencil is a genuinely innovative tool or not. We've been using it for a few years now, and have found that it's great for some things, but useless for others — plus, it costs $145. If you're looking for something to replace a notepad, we wouldn't recommend the new iPad, as it's really difficult to write legibly on them, thanks to the way the tip of the Pencil glides across the surface. Apple could make the glass more matte and ridged to help, but that would make the display harder to see, so it's not an easily solved conundrum.

The Notepad app is fine, and allows you to write and sketch. The iWork Suite is now collaborative, too, and you can mark-up documents on it. This would be a lovely feature if writing on it was easy.

Where the stylus does become worth the outlay is when you want to be artistic, and there are a few good apps out there that let you colour, change the shading of a photo or get deep into some photo/video manipulation. The multi-level pressure of the Pencil comes into its own here, and if you're in any way artistic, then you've got loads of different styles of brush, pen and other drawing implements you can work with. It's worth remembering, though, that the new iPad doesn't come with a keyboard in the box.

One of the main ideas Apple is pushing with the new iPad is that it deserves a place in the classroom. There are apparently 200,000 apps on the App Store for educators and students, and teachers are also getting access to Schoolwork and iTunes U, for course materials and the ability to set assignments and see how students are progressing. Making the iWork suite collaborative and Pencil-friendly will help push this idea, as well as the 200GB of online iCloud storage for students.

The A10 Fusion chip that powered the iPhone 7 and 7 Plus is present here. That's combined with 2GB of RAM, so there's more than enough power for emailing, browsing or

watching video. In our tests, the iPad returned a similar single-core benchmarking score to the more powerful iPad Pro 10.5. In our general testing, we found that it lasted just as well as the iPad Pro 10.5, too. Running the Geekbench 4 battery rundown test saw the new iPad yield 2,620, compared to 2,690 for the Pro. The battery was toast in around 4.5 hours, running at full power. Apple needs the new iPad to last the day if it's going to be used in schools, which should be possible.

In the end, the only upgrades are Apple Pencil support and the faster A10 Fusion chipset at the core, plus Apple's concentration on education. It sounds obvious, but you'll need to know what you want the new iPad for before you can decide if it's for you. ■

[GARETH BEAVIS]

4½

APPLE IPAD (9.7-INCH, EARLY 2018)
From $469 (32GB)
www.apple.com/au

CRITICAL SPECS
9.7-inch Retina IPS display, 2,048 x 1,536p, 264ppi; A10 Fusion chip, embedded M10 coprocessor; 32/128GB, Wi-Fi (802.11a/b/c/g/n/ac) or cellular options; Bluetooth 4.2; available in silver, gold or space grey; 240 x 169.6 x 7.5mm; 469g

Nuraphone

THE FUTURE OF PERSONAL LISTENING LOOKS, FEELS AND SOUNDS AMAZING.

NURAPHONE IS A truly unique beast in a world that's taking its sweet time to evolve, and we commend the bold leaps it's taking. From the moment you open the box, it's immediately clear that this Melbourne-based company has taken the design process very seriously. It's rare that the included carry-case is worthy of mention, but this hard-shell offering is the best we've seen — a magnetic clasp, solid construction and a magnetically-detachable cable organiser transform it from a token inclusion into an essential companion to the Nuraphone.

The attention to detail extends to the unit itself, with a similarly sleek matte-black aesthetic and minimal-leaning design. The headband is sturdy and flexible and is coated in the same silicon as the earcups, yet doesn't grease up or sweat as much as you'd expect. To adjust the size, you'll need to slide the cups themselves up or down the band's groove, and while this can prove a little awkward considering the button placement, you shouldn't have to do it more than once or twice.

This minimal design ethos has made for some deftly subtle controls in the form of a configurable touch-activated button on both extremities of the headphones, but these are easy to locate while wearing and respond with a satisfying vibration when activated.

While the trend for active noise-cancelling in wireless cans is reaching the point of ubiquity, the in-ear and on-ear combination of the Nuraphone provides enough seal to passively achieve similar results. However, this dual-seal design element is likely going to be the unit's most divisive feature, as the feeling of wearing both styles at once may take some adapting to, even for people used to both formats.

Once you've adjusted to the sensation of wearing the Nuraphone, it provides the most unique listening experience available on the market. Sit yourself in a quiet room and run through the automatic personalisation process on the free and intuitive Nura app in order to build your sound profile, which can, in turn, be stored in the headphones themselves. A series of tones cause your cochlea and eardrum to vibrate and produce their own tiny noises, which are then picked up by hyper-sensitive microphones and are used to determine how adept your ears are at catching various frequencies.

The result? No ear- or headphones possess as much clarity or sounds as alive as the Nuraphone. For an experience even more mind-blowing, the Immersion Mode allows you to scale up extra vibration and 'felt' frequencies delivered by the outer-cup, creating the effect of hearing the music live in concert — set off by thudding kick drums and rumbling sub-bass. While this mode will muddy up some styles of music and eventually grow fatiguing if left at higher settings, the slider helps to counter this or it can be deactivated entirely.

While the asking price may seem steep, Nuraphone is almost without competition in what it aims to achieve, and is unparalleled in its execution. With a 30-day satisfaction guarantee offered by Nura, we urge you to try them for yourselves. ∎

[HARRY DOMANSKI]

NURAPHONE
$499
au.nuraphone.com

CRITICAL SPECS
Personalised audio profile; Immersion Mode; Bluetooth aptX HD; 20 hours battery life; dual passive noise isolation; capacitive touch controls; stainless steel, aluminium and hypoallergenic silicon; external microphone; hard-shell case; USB-C, Lightning, Micro-USB, 3.5mm cables sold separately; 329g

WINNER
TECHlife
ED's CHOICE
AWARD

Sensibo Sky

A SENSIBLE SMART SENSOR FOR YOUR EXISTING AC.

AS THE LIST of devices smart speakers can control around the house grows, so too does the list of existing household tech you wish you could control with your voice. Fortunately, the gap between what you can control with a remote and what you can control with an app isn't as big as you might think. Sensibo Sky, the Wi-Fi connected hub that uses an infrared blaster to bring your air conditioner online, is keen to show that old tech actually can learn new tricks.

The smart remote takes a different tact from your average universal remote by limiting itself to servicing a particular air quality device and adding significantly greater functionality as a result. Because it only has one device to manage, the credit-card-sized Sensibo hub syncs perfectly with the unit it controls, allowing it to turn it on and off, tweak temperature-controlled fan speeds and run any other command your device's existing remote does. While it's great that the Android or iOS app lets you control your air con, the real benefits come from Sensibo connecting to your home Wi-Fi and pointing at your device, allowing you to control the unit from anywhere. The app also allows you to integrate with your Google Assistant or Amazon Alexa smart speaker for complete voice control and an integrated thermostat and humidity sensor means you can automate your air quality management based on the room's climate. Considering how expensive a full hub can be, Sensibo is an excellent solution for bringing a specific device into your smart home system. [JOEL BURGESS]

Canon EOS M100

WHERE SIMPLICITY AND MINIMALISM MERGE.

AIMED SQUARELY AT the Instagrammers, Facebookers and smartphone camera users, the Canon EOS M100 is for the selfie generation, made evident by the smartphone-style 180° flip-up touchscreen and minimalistic exterior design. This mirrorless camera comes with built-in Wi-Fi and NFC, with always-on Bluetooth, all to encourage sharing images to social media.

Under the hood, the M100 sports the latest 24MP Dual Pixel CMOS sensor featured in some of Canon's DSLRs and bigger (and more powerful) mirrorless cameras. In combination with the DIGIC 7 image processor, not only is the autofocus (AF) fast, but the M100 also delivers DSLR-quality images.

The simplistic design makes the M100 look like a point-and-shoot, with all the tech buried inside, making it rather tricky to get the right settings for individual scenarios. The only way to access adjustments like exposure, white balance, shutter speed and aperture is through the touchscreen interface on the rear display, a rather fiddly process if all you want is a quick shot with all the right settings. And being the size and shape of a point-and-shoot, the M100 lacks a viewfinder. Plus, for an interchangeable lens camera, it has a limited range of lenses on offer as compared to other mirrorless options.

With an ISO range of 100–25,600, 6fps burst shooting and a 45-point AF system, the M100's performance in well-lit conditions is par excellence but shows signs of fatigue in low light. And while it does capture 1080p video at 60fps, Canon still doesn't offer 4K recording in its entry-level range.

Although Canon has kept the M100 simple for a reason — it will help you hone your artistic skills, but won't do your technical skills any favours — chances are you'll soon find yourself in the market for an upgrade if you outgrow it fast enough. [SHARMISHTA SARKAR]

4½

SENSIBO SKY
$159
www.sensibo.com

CRITICAL SPECS
Compatible with all remote controlled AC units; 802.11b/g/n Wi-Fi; thermostat, humidity sensor, location-based automation, infrared blaster, micro USB power, 8.3 x 5.7 x 2cm

3½

CANON EOS M100
$749 (Body + EF-M 15–45mm f/3.5–6.3 IS STM lens)
www.canon.com.au

CRITICAL SPECS
24.2MP APS-C CMOS sensor; DIGIC 7 processor; 6fps burst shooting; 49 AF points; 1080p/60fps video with digital IS; Wi-Fi and NFC, Bluetooth; 295 shot battery; 10.8 x 6.7 x 3.5cm; 302g

Gigabyte Aero 15-15WV8 (2018)

THE REFRESHED AERO IS AGAIN GOING FOR GAMING-GRADE SPEED IN A PRO FORM FACTOR, SO IS THIS COMBO STILL AIR TIGHT?

OVER THE LAST few years, Gigabyte's Aero range of laptops has attempted to bring premium gaming components to the ultrabook form factor, and this newly-refreshed Aero 15 is no different. Combining a 15.6-inch Pantone colour-calibrated screen, full-sized keyboard with number pad, dedicated Nvidia GTX 1060 GPU and a generous 94Wh Li-Ion battery within a slim 35.6 x 25 x 1.9cm chassis is an impressive feat of engineering. Add to that one of Intel's new high-end 8th-generation mobile CPUs, 16GB of DDR4 RAM and a 512GB SSD and you have a cutting-edge gaming PC that slyly takes the shape of a professional ultrabook.

Pushing the envelope this far has invariably led to some design choices that will be divisive — like dropping the web camera to the bottom of the screen, and giving the keyboard a fractionally off-centre and slightly crowded feel. On the whole, though, these compromises seem to have been carefully considered and ultimately end up as minor grievances rather than major caveats.

Taking prime position at the top of the Aero 15 is that display, which looks great in its near bezel-less frame. While the entry-level configuration we tested for this review was only an IPS LCD at 1,920 x 1,080-pixel resolution, it's upped the refresh rate from last year's model from 60Hz to 144Hz, and it still has that unique Pantone colour calibration.

Packing the first six-core mobile CPU we've seen from Intel — one of the company's new high-end 8th-gen Core i chips — the Gigabyte Aero 15 cut a swathe through our CPU-intensive benchmarks. Take the raw CPU scores from Cinebench's R15 benchmark and you'll see that, on single-core tests, this laptop's new Core i7-8750H CPU scores only a little better than its i7-7700HQ predecessor on the ASUS RoG Zephyrus, with Gigabyte getting 156 to the ASUS's 149. This 5% per-core boost translates into a 17.4% overall boost in multi-threaded CPU benchmarks when using Windows' 'Balanced' power mode.

However, this CPU can be pushed considerably further by putting the Aero 15 into Performance power mode, which increases that multi-threaded score from 861 all the way up to 1,125 — a massive boost that puts it 53.5% ahead of the ASUS, and fairly close to desktop performance levels. In general work and home tasks, the Aero achieves similarly impressive results, hitting 4,460 and 5,635 in the respective Home (accelerated) and Work (accelerated) PCMark 8 benchmarks, which means it powers through tasks better than any previous laptop we've tested with 16GB of RAM.

While the Aero 15 has generous GPU power for a professional ultraportable, the Nvidia GeForce GTX 1060 model is a bit middle-of-the-road when it comes to performance against today's gaming laptops. It'll still get close to, if not more than, 60fps on most early 2017 games using Ultra settings at 1080p, albeit it only managed 35fps on *Ghost Recon Wildlands*. Turn down those graphical settings a little, however, and you'll be able to really put that 144Hz screen to use, with less-demanding titles often pumping out over 100 frames per second.

Gigabyte has done some work optimising the battery life, allowing it to get over 7 hours of movie playback when in Performance mode. And while the unit is on the heavy side at a little over 2kg, for something with this much power and battery life, it's actually exceptionally lightweight. The updated model does sacrifice the 3,000/1,500MB/s NVMe SSD from last year's model for a slower 500MB/s SATA SSD, but this is the device's only real step backwards — and it's a largely inconsequential one. ■ [JOEL BURGESS]

GIGABYTE AERO 15
From $2,899
www.gigabyte.com.au

CRITICAL SPECS (AS TESTED)
Windows 10 Home or Pro 64-bit; 15.6-inch FHD (1,920 x 1,080) 144Hz LED display (Pantone calibrated); 2.2GHz Intel Core i7-8750H (hecta-core, up to 4.1GHz) CPU; Nvidia GeForce GTX 1060 graphics; 16GB DDR4 RAM; 512GB Crucial SATA 3 SSD storage; 802.11ac Wi-Fi, Bluetooth 4.2; 35.6 x 25 x 1.9cm; 2kg

GENERAL PERFORMANCE	MEDIA ENCODING PERFORMANCE	MEDIA ENCODING PERFORMANCE	GRAPHICS PERFORMANCE	GRAPHICS PERFORMANCE	GRAPHICS PERFORMANCE	BATTERY LIFE
PCMARK 8 — HOME (SCORE)	HWBOT X265 1080P (AVG FPS)	CINEBENCH — MULTI-THREADED CPU	3DMARK FIRE STRIKE EXTREME (SCORE)	GRID 2 - ULTRA 1080P (FPS AV.)	THE DIVISION — ULTRA 1080P (FPS AV.)	PCMARK 8 — HOME ACCELERATED (HRS:MINS)
4,460	34.323	1,125	4,882	118.74	52.3	06:17

Nokia Steel HR

A HYBRID WATCH WITH HEART.

THE STEEL HR is the most watch-like fitness tracker we've seen. It looks attractive and has a premium design, and compared to smartwatches available on the market, the smaller size and slimmer design makes this much more comfortable to wear. On the right-hand side of the watch display, you'll find the only button. It looks like a crown, but won't spin and just works as a button to cycle through the stats menus, namely heart rate, steps, distance, alarms and battery life. Just above the six o'clock on the watch face sits the percentage calculator, which will go up the more steps you take in a day. The time is still easy to read, too, which is one of the most important things for most people buying a hybrid smartwatch.

The Nokia Steel HR won't be able to do as much fitness tracking as a lot of other trackers on the market, though. It's mainly useful for tracking steps, which we found to be accurate. The big highlight is the heart rate tracker. This sits against your wrist and will take a reading every half an hour. It'll also continuously monitor your heart rate when you're working out to identify how well you're doing — all of that info is then available in the Nokia Health Mate app, which is one of the most useful on the market. The Steel HR can also be taken in the pool and keep track of your sleep. There's also an alarm function that allows you to wake up slowly with gentle vibrations on your wrist. It offers great battery life, too, lasting up to 25 days depending on how much you're using the features, and recharges easily with its including charging pad.

This is a device built for those who don't like the standard fitness tracker design and want something with a little more style. Its features are limited and it's a shame Nokia hasn't packed in other workout types, but if your exercise routine is limited to walking, running and swimming, you will get along well with this tracker. [JAMES PECKHAM]

Nokia Body Cardio

STYLISH SCALE AT A PRICE.

THE LOWLY BATHROOM scale may not rank highly on your desirable tech list, but Nokia's done well to make the Body Cardio look alluring. Not that Nokia had to try too hard, as the company ported the sleek metal and glass number over wholesale in 2016 when it bought Withings, who originally made the scales (likewise the Steel HR, left). Still, once the Body Cardio is on your bathroom floor, you'll be more than tempted to step on and see what it has to say about your weight, pulse rate, bone and muscle mass, and your water and fat percentages. (Be mindful of the exposed micro USB charging port in wet rooms — we can't see any waterproofing credentials, though the scale should provide a year's worth of use on one charge.)

The LED screen gives good, clear information, and it's fast to act once you step on, but you'll need to turn to your smartphone to get the full rundown. The app's pleasant to use, and has a few fitness programs to improve your health and well being, as well as offering tips while pregnant. You can also add family members so they can look at their stats on their phones, too.

It's a lovely unit, though it's over a $100 more expensive than the Fitbit or Garmin equivalent. If you're not already invested in either of those ecosystems, this is a good option, especially when paired with the beautiful Nokia Steel HR. It comes close to a recommendation, then, but a major advertised function, Pulse Wave Velocity, which measured the stiffness of your arteries, has been removed with a firmware update due to regulatory concerns. It was a truly unique feature, and we have no idea when it's coming back and nor does Nokia. When it does, add a point to the below score. [PAUL TAYLOR]

3½

NOKIA STEEL HR
From $299.95 (36mm); $339.95 (40mm)
health.nokia.com/au

CRITICAL SPECS
iOS and Android; Bluetooth; tracks heart rate, steps, distance, calories, sleep, swimming; silent alarm; phone message notifications; water resistant to 50m; up to 25 days of battery; 36mm steel or rose gold body (white or black face), 40mm steel body (black face only) variations; 39g (36mm), 49g (40mm) minus strap

3

NOKIA BODY CARDIO
$319.95
health.nokia.com/au/en/body-cardio

CRITICAL SPECS
Requires iOS 8 or Android 5.0 or higher; 2.9-inch display, 128 x 64 pixels; high-strength tempered glass platform; free and unlimited online storage of weight readings; 32.7 x 32.7 x 1.8cm

+

THE IROBOT APP KEEPS THINGS NICE AND SIMPLE OFFERING A SINGLE 'CLEAN' BUTTON ON THE APP'S HOME PAGE THAT INITIATES A VACUUMING CYCLE, BUT THERE'S ALSO A SERIES OF TABS FOR TWEAKING CLEANING SETTINGS, LOOKING THROUGH CLEANING LOGS AND SCHEDULING AUTOMATED CLEANING ROUTINES.

iRobot Roomba 980

IS IROBOT'S PREMIUM VAC CAPABLE OF CLEARING A PATH TO A LESS CHORE-RIDDLED EXISTENCE?

UNLESS YOU HAVE exorbitant amounts of cash to burn, $1,449 is a lot of money to spend on a vacuum cleaner, but if that grand price tag includes the cleaning itself, then it starts to seem like a justifiable lifestyle investment. The Roomba 980 is the top-of-the-line automated vacuum cleaner from America's top selling robovac company iRobot, and if you live in a single-level apartment or house, then this staircase-avoiding robotic cleaner is more than capable of pulling its weight.

Guided by its iAdapt 2.0 floor sensors and a series of bumpers, the Roomba 980 is a capable explorer that will do its best to navigate around obstacles in the rooms it's cleaning. While the 'cliff detection' mechanism works well (stairs are apparently cliffs to an object destined for menial chores), the pre-programed obstacle avoidance can be a little precious. During our test runs, if chairs partially obscured a passageway, the robot would often avoid cleaning those particular areas, even if there was enough space for it to pass. That said, it does get progressively better at recognising the cleanable floorspace using its 'vSLAM' mapping technology and reduces the random paths it takes to make more precise floor schematics. If you keep things out of the way and roughly in the same positions, it'll cover about 95% of the available surface area pretty reliably after a few exploration runs. This unique mapping system also makes the Roomba 980 better at finding its home base, more adept at avoiding jams and much faster than other robovacs we've tested.

If you want to cordon off particular areas — either they're messier than the vacuum will be able to deal with, or it contains low lying things you'd rather weren't collected — the package comes with two virtual barrier towers that will create no-go zones.

The iRobot app keeps things nice and simple offering a single 'clean' button on the app's home page that initiates a vacuuming cycle, but there's also a series of tabs for tweaking cleaning settings, looking through cleaning logs and scheduling automated cleaning routines. The Roomba 980's settings allow you to configure how many times it'll clean a particular area, whether or not it boosts suction for carpet and how thoroughly you want it to clean the hard-to-reach edges of a room, all of which make noticeable differences to speed, energy usage and overall cleanliness. The History tab lets you analyse cleaning logs with start and finish times, detailed stats on dirtiness, time and total cleaned surface area, and a floorplan of completed jobs.

While the 980 is only the size of a dinner plate and just 20cm tall, it actually has a reasonable dustbin capacity. The two-hour battery life is more than enough to cover the 48m² cleanable surface area of our office, which takes only 35 minutes, but as long as it's not excessively dirty, you could conceivably clean hundreds of square meters per session. It's worth noting that this space is also entirely carpet covered and we left the carpet boost and edge cleaning settings on, which will drain more power and slow the cleaning process down.

Vacuuming is a little loud, so you'll want to schedule runs when you're out or at work, as you wouldn't want to hear the consistent drone and occasional navigational thud while you are trying to sleep. You'll have to make a few tidiness concessions if you want to make the most of the Roomba 980 and, even then, you wouldn't trust it on its own before a dinner party. But as an everyday solution that'll break the back of your household chores, it will (eventually) earn its keep. ■ [JOEL BURGESS]

4

IROBOT ROOMBA 980
$1,449
www.irobot.com.au

CRITICAL SPECS
Max 2-hour battery life; app integration; cliff detection sensor; carpet and hard floor adaptors; Amazon Alexa and Google Assistant support; 35 x 35 x 9.1cm; 3.94kg

[CATCH-UP ON YOUR TV]

Recording TV with a PVR

STREAMING HAS FAR FROM KILLED THE VIDEO STAR, AS WE ROUND UP SEVEN PERSONAL VIDEO RECORDERS.

[BENNETT RING]

WHEN WE FIRST decided to proceed with a personal video recorder (PVR) roundup, many of us in the *TechLife* office were a little sceptical. A huge portion of our daily video content is no longer beamed to our eyeballs via radio waves; instead, we rely upon IP-based streaming media, be it TV catch-up services, Netflix or purchasing online movies. Even sourcing enough of these glorified, digitised VCRs proved difficult, with many big-name brands no longer making PVRs. Yet after testing seven of the existing models, our minds were changed. There is indeed a place in our content-loving culture boxes.

That's not to say they're for everybody. If you absolutely abhor advertisements, free-to-air TV will probably annoy you thanks to the fact most stations are jam-packed with ads. And if you've already got enough shows and movies to digest via a streaming service, do you really have time for even more? Having said that, most of these products now also include streaming apps like Netflix, so they're a two-for-one kind of deal.

One thing in favour of these devices is the huge variety of free shows on offer these days. Gone are the times when there were only five channels to choose from. From our Melbourne test area, our devices picked up over 60 different free-to-air channels. Granted, some of these duplicate content, with shows from the ABC showing up on ABC Comedy occasionally, but there's still a lot here that you've potentially never heard of. And being able to browse the choices now available, before queuing it up for recording, means you'll never miss it again.

Beyonwiz T2
ONE FOR THE PROS...

IF YOU'RE LOOKING to delve deep into the options of your PVR, Beyonwiz is the brand to turn to. Both of its boxes have by far the most extensive range of options when it comes to recording, and that's both a plus and a minus. If you're the type who wants to select their bit rate and codec when recording, this is the box for you. On the other hand, if you just want to hit record to line up an entire series' worth of shows, this beast is going to be a mind-bender to figure out.

Even though it only has twin tuners, it can record up to four programs at a time. This is the same across all PVRs, but there's a catch. Each tuner can only record a single network, say Channel 7 or Channel 2, but can then split each of those into two channels on said network. For example, you can queue up ABC1 and ABC Comedy using a single tuner. Another feature techies will love is the easy way in which the internal storage can be upgraded. In fact, the base model comes with no hard drive at all — it's up to the buyer to select how much storage they need.

Unfortunately, we think the interface is going to deter most users, as it's just so darned complicated. Who needs 30 different options when choosing to record a TV show? Most users just want to hit record and be done with it. However, if you're looking for absolute, minute control of your PVR, and don't mind getting your hands dirty, this could be the box for you.

③

BEYONWIZ T2
$449
www.beyonwiz.com.au

CRITICAL SPECS
2 x tuners;
various HDD capacities
(1TB in review model/price);
no Wi-Fi

Beyonwiz U4

TEN CHANNELS, ALL AT ONCE.

THE INTERFACE TO the U4 is identical to the T2. In other words, it's complex, intimidating and deep. Whether or not that's what you're looking for is entirely up to you. What this box does have that the others lack is the inclusion of four different TV tuners, meaning it can record a ridiculous ten channels at once. If that's not enough content to keep you busy for the next year, you need to find some new hobbies.

Like the T2, there's one hugely surprising omission with this box — there's no Wi-Fi included. If you want the benefits of internet content, you'll need to shell out extra for the optional Wi-Fi dongle. Given the price, this is hard to accept. It's also got one of least user-friendly remotes out there, with 37 different buttons to get the user nice and confused. Even the amount of info displayed when you change channels is a little overwhelming, with the screen crammed with various bits of data that most viewers won't have a clue about. On the plus side, the interface is super-snappy and responsive when switching between screens, though this was true of all of our boxes. Like its smaller sibling, you can upgrade the hard drive simply, although the inclusion of a 2TB drive should be enough for most couch potatoes.

The U4 is the power-user's PVR of choice. With the ability to record up to ten channels at once, its ability to record multiple shows is unrivalled. Unfortunately, it's let down by a lack of integrated Wi-Fi and an interface that makes a Rubik's Cube look simple.

3½

BEYONWIZ U4
$729
www.beyonwiz.com.au

CRITICAL SPECS
4 x tuners;
various HDD capacities
(2TB in review model/price);
no Wi-Fi

PVR BUYER'S CHECKLIST
WHAT YOU NEED TO KEEP AN EYE ON WHEN SHOPPING FOR A PVR.

TUNERS
If you're a TV addict, you'll want to find a PVR with as many tuners as possible. Each tuner can record a separate TV channel, so the more tuners, the more simultaneous channels you can record. On the same note, the amount of storage space within will limit how much you can record. Obviously, the larger the hard drive, the more content you can record, with a 2TB drive able to record close to a whopping 1,000 hours of TV.

INTEGRATED WI-FI
Integrated Wi-Fi is a huge boon when it comes to these devices. By having internet connectivity, a wealth of information becomes available regarding each program. It also means you can use streaming apps, and usually allows you to watch recordings from your PVR on other devices on your home network, and vice versa.

ELECTRONIC PROGRAM GUIDE
The unit's Electronic Program Guide is the heart and centre of these devices. This shows every program that's coming up, allowing you to choose which ones to record. With over 60 channels, and schedules that run weeks in advance, a clear and clean EPG can make all the difference when it comes to finding what you want.

INTERFACE
On the subject of clarity, an easy-to-use interface is massively important, and you'd be surprised how much PVRs vary in this regard. We're guessing most potential PVR owners will be skewed towards an older demographic, and less likely to get their video online — being easy to use is hugely important.

FANS
Like anything that is going to slot into your AV unit, silence is golden. Some PVRs have fans that are a little noisy — being audible during quiet moments in shows, which is a sure-fire way to ruin suspenseful moments.

CONNECTIONS
While all of the PVRs we reviewed included HDMI, if you're running older AV equipment that doesn't use HDMI (especially for audio), you'll want to ensure your selected PVR has the right output for audio, which is usually an SP/DIF output for older AV receivers.

LIKE ALL STREAMERS, IT'S ALSO HIGHLY DEPENDENT ON THE QUALITY OF YOUR WI-FI. WHILE THERE IS AN ETHERNET PORT, MOST USERS WILL RELY UPON WI-FI, AND STREAMING HD MOVIES CAN BE HIT OR MISS.

Fetch TV Mighty

WE LIKEY!

THE REASON THE Fetch TV Mighty comes bundled with many ISP offerings is the fact that it's so reliant upon IPTV. While the single TV tuner allows you to watch free-to-air broadcasts, the vast majority of channels are delivered over your internet connection. This means there's a huge range of channels available by default that aren't available to regular TV viewers. If that's not enough, you can also subscribe to channel packages, which add additional channels for a monthly subscription price. You can also rent movies or TV shows, with a single standard definition TV show starting around $2.95. There's also a wide range of streaming TV apps included on the box, such as Netflix, Stan and YouTube, yet there's no sign of iView or SBS On Demand.

We absolutely loved the interface on this box, as it's by far the best of the lot; Beyonwiz really should hire Fetch's interface designers. It's easy to read, and setting up the recording of an entire series takes just a couple of button clicks on the elegant remote. It can also stream videos off your home network, though we did have issues with movies that didn't have a compatible codec. Specifically, if a movie had a 5.1 codec, the Mighty couldn't decode this into the stereo output we'd set it up for, so our movies were silent. You can always recode your movies to stereo on your PC, but when things like the Chromecast can do it automatically, it's a shame that the Mighty can't do it.

Despite this small misgiving, we're a huge fan of this PVR. It's ironic really, as most of its channels are IP-streamed, showing that the future of TV really is headed towards being based online.

Fetch TV Mini

AN OVERPRICED STREAMER.

THIS ISN'T A PVR as such, as it doesn't include any form of storage. It's designed as a supplementary device to the Fetch TV Mighty. While the Mighty lives in the family room, doing all of the recording, the Mini sits in your bedroom, allowing you to stream recordings from your Mighty over your home network.

It does have a single TV tuner, so you can watch live TV if you so desire, but it's heavily reliant upon the built-in Wi-Fi to deliver to the maximum of its capabilities. By doing so, it opens up all of the IPTV channels available on the Fetch Mighty, and you can also buy the same channel packages and programs. It's got the same winning interface and remote of the Mighty, making it ridiculously easy to use. However, it also struggles with certain downloaded movie formats — when we tried to watch *Thor Ragnarok* off our NAS, we were left without any sound, and had to revert back to the good old Xbox One to watch it.

Like all streamers, it's also highly dependent on the quality of your Wi-Fi. While there is an Ethernet port, most users will rely upon Wi-Fi, and streaming HD movies can be hit or miss. Surprisingly, Google's Chromecast seems to be one of the only devices we've tested that does this without issue.

For the price, we think you're better off with something like the Chromecast, although you'll miss out on the seamless connectivity between the Mighty and the Mini, not to mention the ability to buy extra channel packages and live TV.

4

FETCH TV MIGHTY
$399 or free with some ISP bundles
www.fetchtv.com.au

CRITICAL SPECS
1 x tuner; 1TB hard drive; six simultaneous recordings via IP; integrated Wi-Fi

2½

FETCH TV MINI
$169
www.fetchtv.com.au

CRITICAL SPECS
1 x tuner; no onboard storage; integrated Wi-Fi

RECORDING TV

4K TV like this TCL C-Series are becoming the norm, so as content catches up, PVRs will also need to be able to record in 4K.

Foxtel IQ3

YOU'RE BUYING MUCH MORE THAN A BOX.

THE FOXTEL IQ3 is a unique beast, as it's not possible to buy this as a standalone product. It comes as standard with all Foxtel subscriptions, so you're going to need to buy into the relatively expensive Foxtel ecosystem to get one. While originally released in 2015, continual updates to the software has resulted in a product that doesn't feel three years old, with a snappy and clean interface that gives Apple a good run for its money.

Despite this box relying on Foxtel's cable- or satellite-delivered shows, it also includes Wi-Fi to access additional Foxtel IP-based content. This is used for certain new shows, as well as certain past broadcasts, so you can watch the show you missed yesterday. Movie prices are a little steep, at $6.95 for a HD version that you can watch for up to 48 hours; fail to hit play for seven days and it'll be wiped, with your money refunded.

Most Foxtel live broadcasts are in 1080i, which definitely isn't as sharp as the 1080p offerings of most channels these days. It *can* do 1080p, though, provided the source program is at that resolution. It's one of the easiest boxes to use, with a clean and intuitive interface, a must given the wealth of content available on Foxtel.

However, there's the issue of overall cost. You're going to need to subscribe to one of Foxtel's packages to get this box, and for the most variety and quality, you're looking at around $60 per month, minimum. Whether that is worth paying depends just how much you love *Game of Thrones* or Foxtel's huge range of exclusive sports coverage.

③

FOXTEL IQ3
Foxtel subscription, plus $125 for additional boxes
www.foxtel.com

CRITICAL SPECS
Records up to 4 programs simultaneously; 1TB storage; integrated Wi-Fi

THE FUTURE OF PVRS
WE DIDN'T THINK PVRS HAD MUCH OF A FUTURE UNTIL WE STARTED TESTING THESE UNITS AND SAW JUST HOW MANY CHANNELS (OVER 60!) ARE NOW AVAILABLE VIA THE FREE-TO-AIR NETWORKS.

There's no doubt that streaming video over the internet is going to continue to bite into the market share of free-to-air, but currently most Australians still watch more free-to-air TV than they do IP-based video. So it doesn't appear that free-to-air is going to disappear in the immediate future, which means we'll still have PVRs evolving along with it.

The biggest difference in future PVRs will likely be the move to 4K support. Most mid-range TVs now support 4K resolutions, so it's a no-brainer that PVRs will have to move to support it too. The problem right now is content; there really isn't much. When that issue is solved, PVRs will face another quandary, in the form of storage. 4K requires more than four times the amount of storage space as a standard HD show. Look forward to PVRs with 10TB of storage, likely spanned across multiple hard drives in RAID mode. We also think more PVRs will start recording streamed video, as the likes of Netflix's 4K service become more common. As these streams require such a large amount of bandwidth, some users may need to buffer them for a long time. Enter a PVR that can record 4K video streams, so your movie is ready to view when you want it.

Finally, as streaming video becomes more pervasive, we can expect PVRs to become true multi-media hubs, with their video-on-demand and DLNA-serving capabilities becoming just as important as their ability to record live free to air TV. Right now, this isn't a priority for many models, but we can see this changing rapidly, with the likes of the Fetch series of units leading the way.

Handbrake is a fantastic free app to convert video formats from one type to another, just in case your original file won't stream properly to your PVR.

CHOOSING BETWEEN THIS AND THE FETCH TV MIGHTY COMES DOWN TO ONE THING — WHETHER YOU WANT TO FOCUS ON MORE FREE-TO-AIR COVERAGE, OR INDULGE YOURSELF IN THE FETCH'S WEALTH OF IP-BASED VIDEO CONTENT.

Humax 2Tune

A NICE MID-GROUND RECORDER FOR FANS OF F2A.

THIS IS ANOTHER one of those clever boxes that allows the use of t wo tuners to record up to four channels, provided they reside on two networks. It's got an elegant external design, unlike the rather utilitarian design of the Beyonwiz units, so it won't look out of place amongst your curved, sleek AV products.

Setting this unit up proved to be a breeze, one of the quickest, in fact, though they're all rather easy compared to PVRs of the past. Making this even simpler is a huge range of help screens that spell out exactly what to do in layman's terms. Like several other PVRs, this unit suggests subscribing to the IceTV EPG (see our boxout about this, opposite). To be frank, we're a little confused by this — shouldn't all of these boxes come with the best possible EPG out of the box, and not suggest a third-party one instead?

The good news is that the default EPG is almost as good as Fetch's, and it's easy to sort via day, week and channel. Recording an entire series takes just two button presses, making it impossible to stuff up. The Wi-Fi dongle means it also comes with apps such as Netflix and +7, though again, there's no sign of dedicated catchup apps. However, these are integrated into the standard EPG so you can watch prior episodes, as with all of the units that support the HbbTV standard (ie, any PVR with Wi-Fi).

Choosing between this and the Fetch TV Mighty comes down to one thing — whether you want to focus on more free-to-air coverage, or indulge yourself in the Fetch's wealth of IP-based video content.

Panasonic DMR-UBT1GL-K

THE ONLY 4K READY PLAYER.

LIKE THE TONGUE-TWISTING name, this PVR isn't the most user-friendly unit around. Considering the top shelf price, the stark EPG doesn't look like a lot of time nor money was invested in it. Figuring out what to record over the following week isn't easy, given the difficulty in finding a clear EPG view of the upcoming content. We also noticed that, unlike other units, when firing up the EPG, many of the show descriptions showed up as blank. The unit prompted us to select each of these and hit the info button to fill in the missing gaps, but this didn't work for many shows.

It seems that the R&D dollars have been pumped into this unit's ace up its sleeve — the inclusion of a 4K Ultra HD Blu-ray player. This also means it can handle 4K streaming content, such as that offered by Netflix. There's also a decent selection of apps, such as Netflix, ABC iView and SBS On Demand. It can also play off a NAS, but like all of our units, it struggled with 5.1 audio sources being converted to stereo.

Given that it has twin TV tuners, we expected it to be able to record four channels, but it's limited to just two, another weakness that none of the other units suffer from. For the price, this caveat is rather hard to ignore. It may not be the best PVR on the market, but the inclusion of 4K support might be enough for owners of 4K TVs to overlook this unit's faults.

3½

HUMAX 2TUNE
$349
au.humaxdigital.com

CRITICAL SPECS
2 tuners; 1TB storage;
Wi-Fi USB dongle included

3
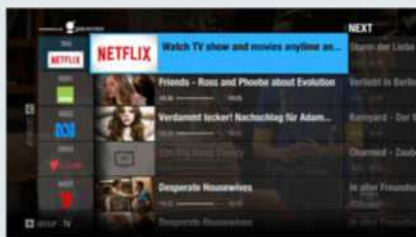
PANASONIC DMR-UBT1GL-K
$998
www.panasonic.com.au

CRITICAL SPECS
2 x tuners; 2TB storage;
integrated Wi-Fi;
includes 4K Ultra HD
Blu-ray player

The Fetch ecosystem includes a smartphone app.

The IceTV interface on a smartphone makes it easy to pick out the best content by various categories.

PVR SECRETS

YOU MIGHT THINK YOUR PVR IS ONLY GOOD FOR RECORDING TV SHOWS, BUT TODAY'S INTERNET-CONNECTED VARIANTS CAN DO A WHOLE LOT MORE.

* Many units can stream content from their hard drive to an external device, including your smart phone when you're out and about. You can also use your phone as a remote control when you're away from home, to set up recordings when someone tells you about an awesome new series while you're at the office.

* If you really want to tap into the best EPG recording, video aficionados rave about IceTV, an Aussie-made EPG that allows you to set up recordings from anywhere with an internet connection. While the company went through some issues a few years ago, they're now back on their feet, and widely acclaimed as the easiest EPG to use. There's a free 30-day trial, if you don't take our word for it at **www.icetv.com.au**.

* If you've only got limited disk space for recording, you might want to lower the bitrate or format that each show is recorded at. You'll find this somewhere in the recording options; a good idea is to change it from HD to SD to dramatically lower recording sizes, though image sharpness will drop as a result.

* On the subject of running out of recording space, check to see how easy it is to upgrade your unit's hard drives. With mechanical drives becoming ever cheaper, it might be more affordable for you to upgrade the storage yourself than buy a model with a bigger hard drive.

* As mentioned in our reviews, most units can't downmix a 5.1 signal to stereo while streaming if you download your chosen video in that format. If it's not, use a free program like handbrake (**handbrake.fr**) to first transcode it to the right format, and then stream it over your network.

* If you live in a remote location and your home doesn't get a very good TV signal, attaching a PVR to it won't magically boost the signal. If you get signs of signal degradation while watching digital channels (it usually shows up as the image degrading into boxes that look almost Lego-like), you're going to need a better antennae installed.

* Most PVRs that have integrated Wi-Fi also include an Ethernet port. As those of you who have tried to stream HD video over Wi-Fi know, wireless playback is flaky at best. If at all possible, use a direct Ethernet connection between your PVR and your media server. An Ethernet over Power kit can come in mighty handy here.

* Some, but not all, PVRs allow forward skipping during playback in 30 second bursts... which just happens to be the exact length of most commercials. As this feature encourages viewers to skip commercial breaks, it's not widely advertised, but a bit of research on your prospective model should reveal all. Otherwise you can simply fast forward, and hope your reflexes are fast enough to catch the end of the ad-break (though some units automatically rewind a little after fast forwarding for just this reason). ■

PAL - 720 x 576
720p HD - 1280 x 720
1080p HD - 1920 x 1080
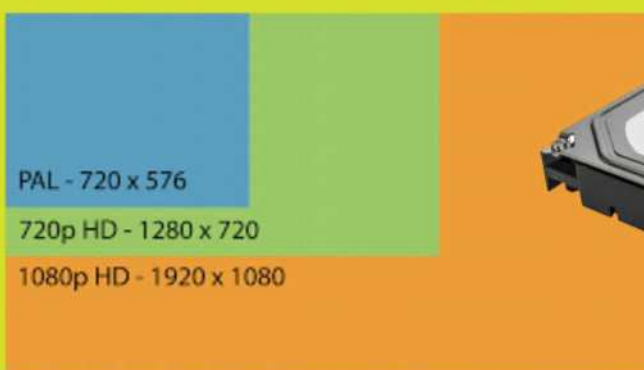
This image shows the relative screen size of the various video formats you can record in — as you can see, 720p uses far fewer pixels than 1080p which will be noticeable.

Some PVRs allow for easy upgrading of the internal storage with a new mechanical HDD.

NAME	# OF TUNERS	STORAGE CAPACITY	SIMULTANEOUS RECORDINGS	INTEGRATED WI-FI	SP/DIF	PRICE
Beyonwiz T2	3	1TB	8	No	Yes	$449
Beyonwiz U4	4	2TB	10	No	Yes	$729
Fetch TV Mighty	4	1TB	6	Yes	Yes	$399
Fetch TV Mini	1	n/a	0	Yes	Yes	$169
Foxtel IQ3	n/a	1TB	4	Yes	Yes	Included with package
Humax 2Tune	2	1TB	4	Yes (dongle included)	Yes	$345
Panasonic DMR-UBT1GL-K	2	2TB	2	Yes	Yes	$998

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MASTER YOUR MOBILE

TAKE YOUR PHONE FROM BUDDING TO BODACIOUS

EXPAND YOUR STORAGE FOR MUSIC, MOVIES & MORE * ACCESSORIES REVIEWED * **TIPS & TRICKS** * TOUGH CASES & MOUNTS TO PROTECT YOUR PHONE * **UNLEASH THE FULL POWER OF ANDROID & iOS**

Android likes to notify you about everything, but who knows where that 'Time to work' came from...

Select which apps to receive notifications from and tap on the app name to choose how.

You can fine tune notifications for each app.

[SUPERGUIDE]

Make the most of your Android

YOUR STOCK SMARTPHONE ALREADY OFFERS A SUITE OF POWERFUL FEATURES.

[CHARLES HANDMER]

ANDROID IS A brilliant operating system, plus it has a huge range of extra functions available through downloadable apps. But before you go filling up your phone with third-party apps, how well do you know what Android can do all by itself?

In this feature, we delve deep into Android to identify the useful features that not everybody knows about. You might be amazed at what is already available.

While Android 6 Marshmallow still powers over 20% of Android phones in Australia, double that number are running a version of Android 7 Nougat, and newer phones are now shipping with, or being upgraded to, Android 8 Oreo. In fact, most Android phones sold in the last year or two are likely to receive an Oreo update this year. For this reason, we have mainly focused on Android 7 and the coming 8 Oreo changes, although many of the features explored are available in earlier versions of Android.

Most phone-specific steps were tested on a Samsung Galaxy Note 8 running Android 7.1 Nougat, with further testing on a range of devices to ensure broad applicability.

If anything we suggest doesn't seem to be working on your phone, run a Google search on your specific model and see if it uses a different set of commands.

NOTIFICATION OVERLOAD

Android loves notifications. It will tell you about every app update, message, reminder or email, and even broadcast it to the world. But how can you control what, when and how you get notified?

Fortunately, it's easy to tune your Android notifications. You can go into your settings — normally marked by a round cog icon — then find the correct menu in 'Settings > Notifications'. Or on many phones, when you swipe down from the top of screen to display current notifications, there's a 'NOTI. SETTINGS' link at the bottom of the list. Either way, tap to manage notifications.

On most phones, you will see a list of apps which you can individually set to:

* Allow notifications for this app — you may also have the option to switch notifications on or off for all apps before fine tuning individual apps.
* Show silently — allow notifications, but no sound, vibration or preview in pop-ups.
* On lock screen — show content, hide content, or do not show notification at all while phone is locked.
* Set as priority — prioritise selected notifications above others, and show them even when Do Not Disturb is active.

In Android 8, you have the option of snoozing notifications on the home screen — just swipe right and tap the clock icon. Default snooze is 15 minutes but you can set whatever you want.

WHILE ANDROID 6 MARSHMALLOW STILL POWERS OVER 20% OF ANDROID PHONES IN AUSTRALIA, DOUBLE THAT NUMBER ARE RUNNING A VERSION OF ANDROID 7 NOUGAT, AND NEWER PHONES ARE NOW SHIPPING WITH, OR BEING UPGRADED TO, ANDROID 8 OREO.

NOTIFICATION DOTS

Even with notifications set to 'off', when you view your 'all apps' screen on recent phones, there may be small dots displayed on the app icons to indicate that there is a notification waiting to be viewed.

DO NOT DISTURB DOWNTIME

Downtime or Do Not Disturb is usually found under your 'Settings > Sound' menu and you can set a Do Not Disturb schedule by day and time. Then you set what, if any, interruptions are permitted within that time — alarms and reminders, for example. You can even set it so favourite or frequent callers can get through

on phone or text while all others are blocked. Do Not Disturb is a great way to take control of how intrusive your digital devices are permitted to be.
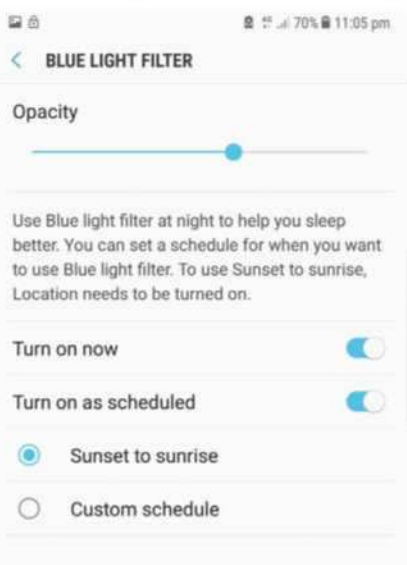
But be warned: you can forget that, for example, your phone is set to not receive calls after 10pm, then wonder why you didn't get that important message about your morning flight being cancelled.
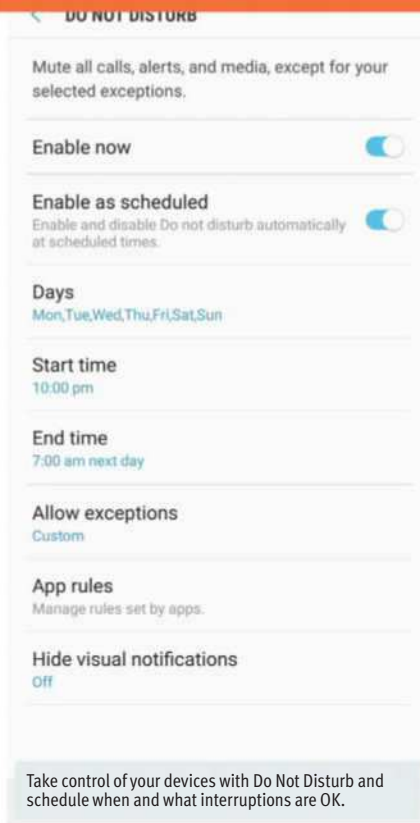
NOTIFICATION LED

It varies from model to model, but many Android phones have a multicolour notification LED. Sadly, there's no built-in ability to change colours for different notifications, so we're breaking the no third-party apps rule on this one. Several apps on the Play Store including the free (with paid upgrade) Light Flow (**www.reactle.com**), which allows you to customise the LED notifications. The exact options depend on your phone, but you can set different colours for different notifications, such as messages or email. You can also use different blinking, or have the app cycle through the most important, or all the current notifications. Note that this app seems to have some issues on Android 8 at the moment. For phones without a notification LED, the Flashlight Notifications app performs a similar role using your camera flash LED.

AVOID THE BLUES

Our digital screens typically mimic the colour spectrum of daylight, and research suggests that exposure to this light at night can disrupt sleep patterns. Decreasing the amount of blue light, making the screen look warmer, helps reduce these effects. Nearly all Android phones have this feature, called Night Light, Night Mode, Blue Light Filter or the like. You will usually find it under 'Settings > Display'.

Many phones also have an auto brightness control that dims the screen at night or in dark locations. Some learn your pattern of usage to personalise the lighting response. Check that it is switched on.

If your phone doesn't have these useful features, there's a range of apps available to automatically adjust your screen colour at sunset and dawn. One favourite is Twilight (**www.twilight.urbandroid.org**), which is free and automatically adjusts based on your location.

UNLOCK AT HOME

Lock screens are important for phone security, but can be a pain at times. However, you can set your phone to unlock automatically when at home, at the office, in the car or anywhere

else where you don't want it to lock right when you're about to use it.

Go to 'Settings> Lock screen > Smart Lock' for the options. As well as defined 'Trusted Locations', unlocking can be based on being in your pocket, hearing your voice or more. If your car is Bluetooth enabled, set it as a 'trusted device' to keep your phone unlocked when in or around the car.

GET BACKUP

Android backs up system data by default, but check it is turned on at 'Settings > Backup & Restore'. Provided you are logged in to a Gmail account, your core data will be backed up and can be restored, including to another phone, very simply.

Take control of your devices with Do Not Disturb and schedule when and what interruptions are OK.

Light Flow lets you set an LED colour and sequence for every conceivable notification.

Adjust your screen to be softer and warmer at night, and sleep better.

Add a trusted location or Bluetooth device connection that keeps your screen unlocked.
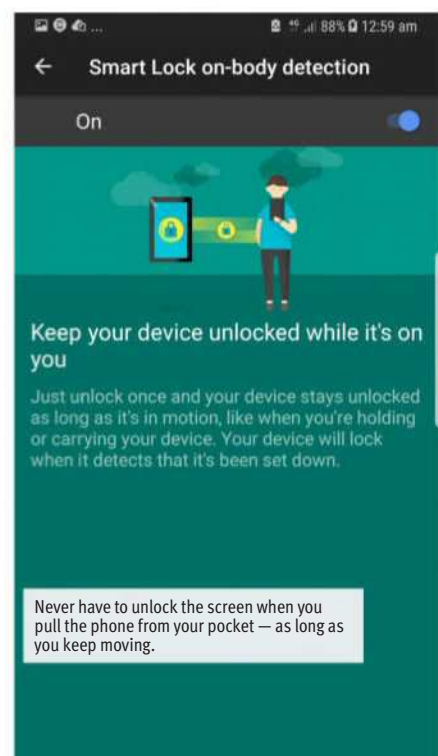
Never have to unlock the screen when you pull the phone from your pocket — as long as you keep moving.

Finding your phone really is as simple as typing "find my phone" into the Chrome browser, plus you can ring it, lock it or nuke it.

Android phones usually default to the mid power saving setting, but you can take it to the max.
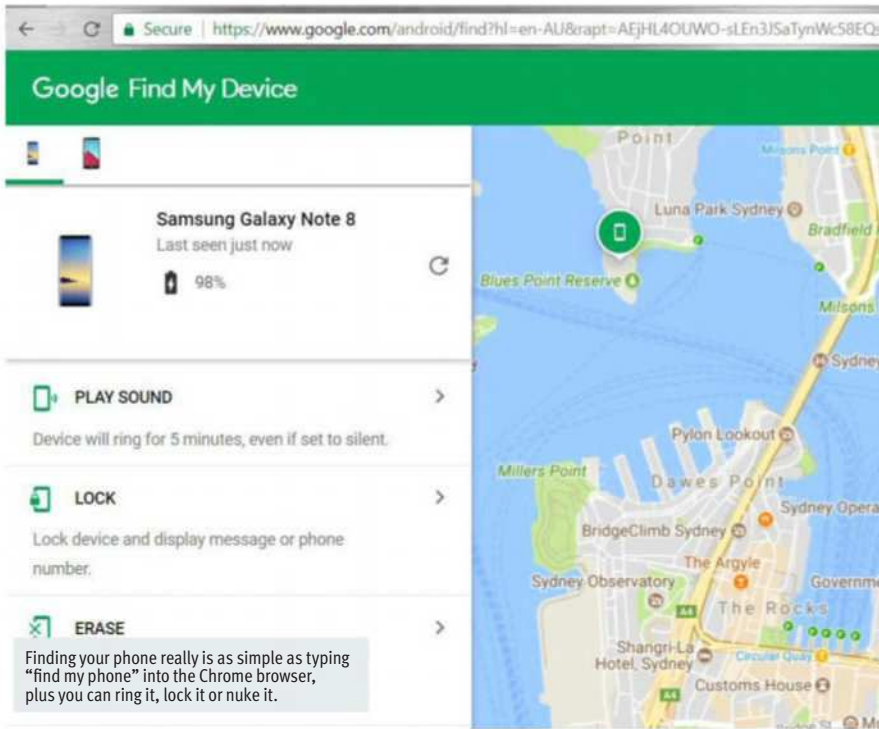
Google Photos gives unlimited free photo and video backups, so that's a great deal that can save your unique photos should something happen to your phone. Just remember to set it to upload via Wi-Fi only — photo and video uploads use a lot of bandwidth. Google Drive and Google Play Music handle documents and music for free, and are well worth using.

Backing up your SMS and call logs needs a downloaded app (unless you have a Google Pixel phone). Google provides Android Messages for free, or there are more comprehensive third-party apps such as SMS & Call Log Backup. Phone compatibility varies, so you just have to try them and see what works.

LOCATION, LOCATION, LOCATION

Android has a built-in device manager

> WITH ALL SCREEN TYPES, TURNING DOWN THE BRIGHTNESS, AND SETTING THE SCREEN TO GO OFF MORE QUICKLY, WILL SAVE POWER AND LEAD TO SIGNIFICANTLY LONGER BATTERY LIFE.

that allows you to remotely locate, ring, lock or erase a lost or stolen phone. By default, your phone should have the Android Device Manager app already installed, otherwise download it from Google Play. The actual remote management is via computer — go to **www.google.com.au/ android/device manager**, log in to your Google account and you can see a map of where your phone is located, as well as issue commands to make it ring, wipe it clean of all data or just lock it.

If you have more than one Android device, you can use the Android Device Manager app, which you can keep on all your devices to locate and manage the others.

There are also paid third-party tracking apps such as Cerberus (**www.cerberusapp. com**), which can give extra features such as the
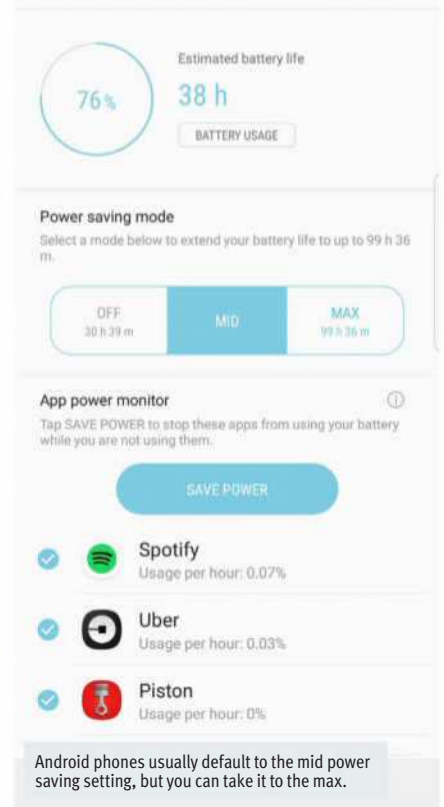
ability to take pictures remotely and display messages. Of course, you should never attempt to get a stolen phone back in person — contact your local police.

SET REMINDERS REMOTELY

Logged-in Chrome users on a computer can type a range of plain English commands straight into the search bar to activate a number of useful features. Typing "where is my phone" or "find my phone" takes you to the Android Device Manager map, but the feature with endless uses is Reminders. Just typing "remind me to call Kim tomorrow at 2pm" or "remind me to buy milk/flowers on the way home" sets up reminders on your phone — remotely. Location-based commands work, too, so "remind me to buy paint at Chatswood Bunnings" will activate a reminder when you next visit that location. Try it — the options seem endless.

MAX BATTERY LIFE

All Android devices running 6 Marshmallow or newer have a 'Battery Saver' feature. Head to 'Settings > Battery > Battery Saver' (menu names may vary by device). You typically have a choice of three default settings, plus you can customise them. Going for maximum battery can triple standby battery life, but takes some radical changes. On the Samsung Note 8, the Home screen goes jet black, with minimal icons displayed along with basic menus and functionality. But it works, and that black screen is pretty cool!

If you don't want to go so far and have a smartphone with an AMOLED screen, choosing a black or simple dark background for your screen is a very easy way to save significant battery power. Most newer Samsung and Nexus smartphones are AMOLED, along with many

Backup is easy to set up on multiple services.
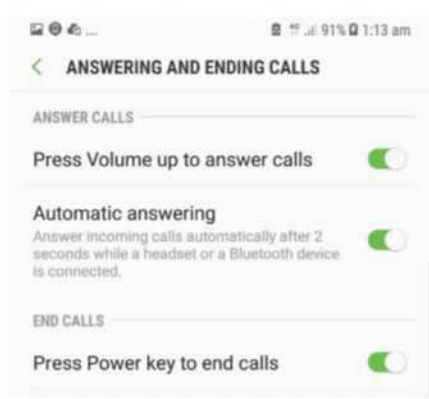
It's so easy to answer and end calls one-handed with the side buttons when you are holding the phone.

Select 'Maximum Power Saving' and everything goes black — and estimated battery life, for us, went from 38 hours to 95 hours.

Quickly launch your camera by double-tapping the power button, and much more.

Want your phone to read to you? Just select 'Text-to-speech' and see what it has to say.

Type "remind me to…" into Chrome and the 'Set a reminder' box pops up. You can schedule a time or place and the reminder will appear on your phone at that time or place, simple as that. In this example, I did not specify a store location, and the system automatically identified the closest store. If I go there, my phone will tell me to buy blue paint! Thanks, phone!

others. You can download dark wallpaper themes if they are not available on your phone to give it a try.

With all screen types, turning down the brightness, and setting the screen to go off more quickly, will save power and lead to significantly longer battery life.

There are some interesting comparisons and charts here: **tinyurl.com/tla77-power**

If you're on Android 8, a great power saving option is to set your Wi-Fi to stay off except at home or when in range of a network you have connected to previously. Find the 'Turn on Wi-Fi automatically' option in 'Settings > Network & Internet > Wi-Fi > Wi-Fi preferences'.

PUSH BUTTON SHORTCUTS

There are so many ways to program your Android smartphone's buttons, and a good start is to head to 'Settings > Accessibility > Answering and Ending Calls' and select

'Power key to end calls'. Then a short push on the power button ends your calls, which can be so much easier than tapping the screen. Check out the other options while you're there to see what works for you.

For more customisation options, go to 'Settings > Advanced Features', where simple features like quickly pressing the Power button twice opens the camera, and switches front and rear cameras. On some phones ,the Volume Down key does this, and takes a photo, too.

Or for no button operation, many cameras can take photos when you smile, make a certain gesture or say certain words. It can get very amusing when your phone is set to take a photo whenever it hears the word 'cheese'. Just look for the option in your camera settings, and smile.

TEXT-TO-SPEECH

Not only can you read an article but you can

also listen to it on many Android devices. So if you prefer to hear incoming information rather than see it, go to the Accessibility section in Settings and turn on the 'Text-to-Speech Output' option. You can adjust speed and pitch of speech, too.

ZOOM IN

As screen resolutions go higher, text gets smaller, but this feature can help out. Go to 'Settings > Accessibility > Magnification > Magnification Gestures'. Then you'll be able to zoom in on any part of the display just by tapping it. Note that this varies from phone to phone, and may disable other display features.

GUEST MODE

If you would like to temporarily give your phone to another person, yet keep your personal data confidential, use Guest Mode. Go to 'Settings > Users and accounts > Users > Guest' or swipe down from the top with two fingers, and tap the User icon on the upper right. The 'Add Guest/User' icon will appear, and you'll be able to choose which actions the person handling your smartphone will be allowed to take.

Unfortunately, the latest Samsung phones don't support Guest Mode, relying instead on their password protected Secure Folder. Secure Folder might be more secure, but it's nowhere near as convenient.

An alternative option on some phones is screen pinning. This locks the current app to the screen, and using anything else requires an unlock. Turn it on via 'Settings > Security > Screen pinning', then pin a screen by locating and selecting the pin icon. ◾

iOS 11 tips and tricks

TAKE A GUIDED TOUR THROUGH THE NEW AND IMPROVED CAPABILITIES OF THE LATEST IPHONE AND IPAD OPERATING SYSTEM.

THERE ARE MANY new and improved features in iOS 11, and the handful of examples we've covered in our Help Station section so far are just the start of getting more from the new iPhone and iPad operating system. Whether you held off upgrading for a while, until Apple fixed a few bugs, have just upgraded to a new device in order to run the new system, or are simply hungry for even more tips and tricks, you'll find plenty of them here.

Over the next few pages, you'll learn about changes to: notifications and the Lock screen, including how to increase your privacy when your device is locked; improvements to Maps that help you to get around indoors, and to drive more safely; and — one of our favourites — the new things you can do in Notes.

LOCK DOWN NOTIFICATIONS

The basics of notifications remain the same in iOS 11. They can appear as a banner across the top of the screen, play a sound and display a badge on their parent app's Home screen icon to remind you there are things awaiting your attention. However, there are some important changes to know about. Helpfully, they include the use of clearer language to describe behaviours and hopefully prevent confusion.

In the past, you might have stopped an app showing notifications on the Lock screen because you didn't want it to display potentially sensitive data there. Problem is, you could also miss important notifications. Fortunately, this should no longer be necessary — one of iOS 11's most welcome changes can fix that and maintain privacy.

01 BANNERS, PLAIN AND SIMPLE

The first change is a matter of clearer terminology, and will be beneficial if you're new to iOS. Previously, Apple used the term 'banners' to refer to the kind that briefly pop in at the top of the screen and disappear a few seconds later, and 'alerts' for those that look identical but stick around until opened or dismissed.

In iOS 11, both are now called banners, and the distinction between them is clearer: in 'Settings > Notifications', tap an app's name and you'll find the two kinds of banner described as 'temporary' and 'persistent'.

02 NOTIFICATION CENTRE AND THE LOCK SCREEN

Go to any app's notification settings and you'll see that, while there's still a 'Show on Lock screen' item, 'Show in Notification Centre' has gone. In previous versions of iOS, you could set an app's notifications to appear in one of those places but not the other, which could get confusing. That's no longer possible. Whether you catch up on notifications on the Lock screen or in Notification Centre, you're presented with the same list of items. Really, Notification Centre is now the same thing as the Lock screen. However, there is a new setting for each app's notifications, 'Show in History', which we'll talk about in a moment.

03 INSTANT PHOTOS, WHEREVER YOU ARE

There's a functional benefit to the Lock screen and Notification Centre being the same thing, save for the distinction of whether your device is locked or unlocked (which is important to the next tip, about notification previews). The two locations aren't just the same in terms of displaying notifications. Even while you're using an app, you can swipe down from the top of the screen to open Notification Centre, then left on an empty area of it to access your device's camera features within seconds. That gives you a better chance of catching a good photo opportunity whatever you're doing.

04 TO PREVIEW OR NOT TO PREVIEW

In previous versions of iOS, notification settings for a few apps — notably Mail and Messages — included a 'Show Previews' option. You could change this from 'Always' to 'When Unlocked' or 'Never' to prevent private info being visible on the Lock screen.

The majority of apps didn't offer this, though. iOS 11 fixes this with a global 'Show Previews' setting at the top of
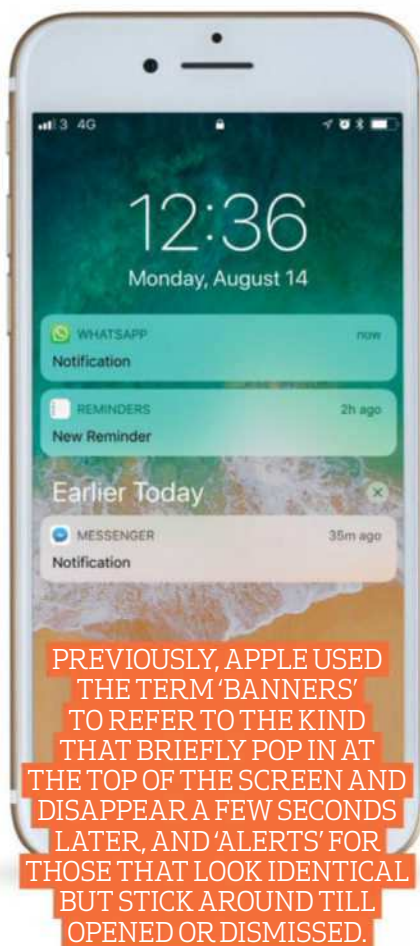
'Settings > Notifications', providing a way to ensure no info from any app is readable by roving eyes.

This default setting for all of your apps is supplemented by a new 'Show Previews' item within every app's settings. This arrangement gives you more privacy by default, but you can allow apps to deviate from the norm if you're confident that they won't leak anything sensitive.

> PREVIOUSLY, APPLE USED THE TERM 'BANNERS' TO REFER TO THE KIND THAT BRIEFLY POP IN AT THE TOP OF THE SCREEN AND DISAPPEAR A FEW SECONDS LATER, AND 'ALERTS' FOR THOSE THAT LOOK IDENTICAL BUT STICK AROUND TILL OPENED OR DISMISSED.
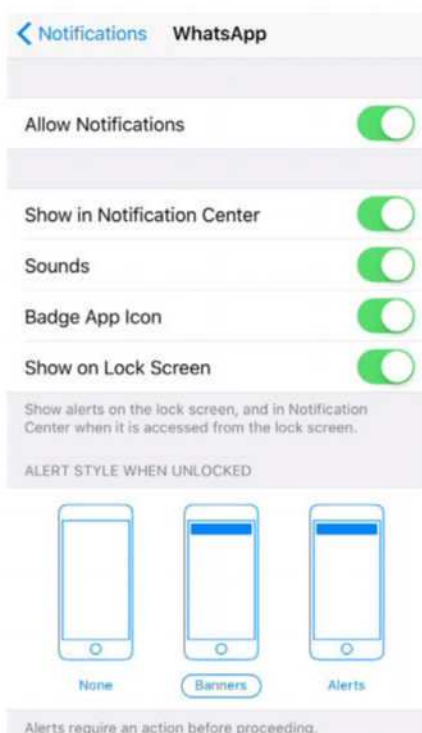
05 REST FINGER TO PREVIEW

Prior to iOS 11, you might have enabled 'Settings > General > Accessibility > Home Button > Rest Finger to Open'. If that's the case, and you set the master 'Show Previews' setting to 'When Unlocked', after unlocking your device, you'll have to pull down Notification Centre to read the items that were shown on the Lock screen.

Disable that accessibility setting and, after waking your device, resting your finger on the Touch ID sensor will unlock your device but immediately preview your notifications; press the Sleep/Wake button if you want to lock the device and hide the previews again.

06 NOTIFICATIONS HISTORY

There are two tiers to notifications in iOS 11. Tap any app's name in 'Settings > Notifications' and you'll see the traditional 'Show on Lock Screen' item, which is the list of recent and unattended alerts shown as soon as you wake your device or open Notification Centre.

The 'Show in History' item refers to the list of older notifications you haven't acted upon or dismissed, which is shown when you swipe up on the Lock screen or Notification Centre. So you might have Facebook's Messenger app inform you of direct messages on the Lock screen and in Notification Centre, but confine status updates from Facebook to the history, for example.

FIND YOUR WAY WITH MAPS

Apple's Maps service now helps you to navigate indoors as well as out, thanks to the addition of interior maps for shopping malls and airports. This covers many popular destinations already (mostly in the US), with more set to be added every month. (We can't wait for Macquarie Shopping Centre to be covered.) There are new features to help keep drivers safe and more informed, plus a useful tweak if you use ride-booking apps, too.

SHOPPING CENTRES AND AIRPORTS

01 INTERIOR MAPS
Floor plans for select shopping centres and airports are now available in Maps, both in 2D and 3D views. If you happen to scroll the map so that a place with an interior map comes into view, tap 'Browse <place name>', which slides in at the bottom of the screen (iPhone) and appears at the top right (iPad) to browse the full, multi-floor map. The area outside the shopping area or airport is dimmed.

02 SWITCH FLOORS
The floor number you're viewing is shown near the top right of the screen. Tap it for a list of all floors, then one of those to see that floor's layout. The list remains open so you can quickly browse marked points of interest across several floors. To close the list, tap the X above it, or an unmarked spot on the map. Stairs, escalators and lifts are marked on the map to help you plan your route.

03 BROWSE BY CATEGORY
When you've started to browse an interior map, swipe up on the panel to pull it into view (it's actually always in view on iPad). You'll see icons for the various types of business there, public toilets, as well as places to get refreshments; tap one to filter the map to show only that kind. To switch to another kind of business, tap the X at the top right to go back to the list of categories.

04 BROWSE FROM A TO Z
Alternatively, tap the 'All Shops' icon to open a screen-high list of businesses and features within the location, complete with an alphabetical index as a shortcut (like in the Music app), down the list's right edge. In any view of the location, tap a business on the panel or its point-of-interest icon on the map to read more about it; this information includes opening hours, contact details and reviews.

THIS COVERS MANY POPULAR DESTINATIONS ALREADY (MOSTLY IN THE US), WITH MORE SET TO BE ADDED EVERY MONTH.
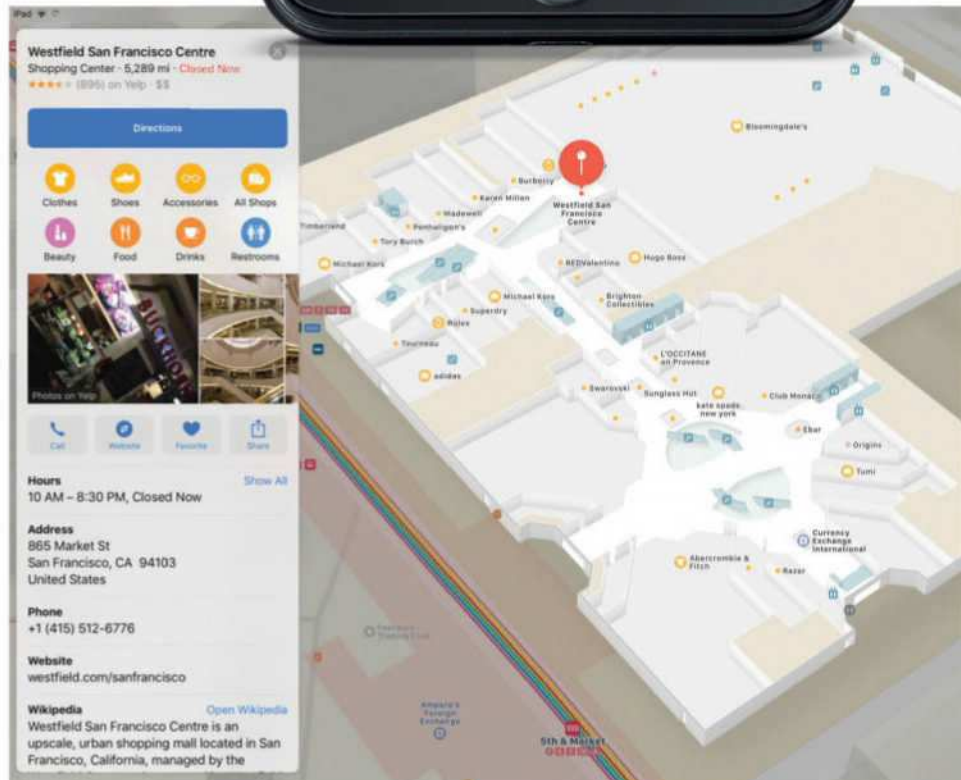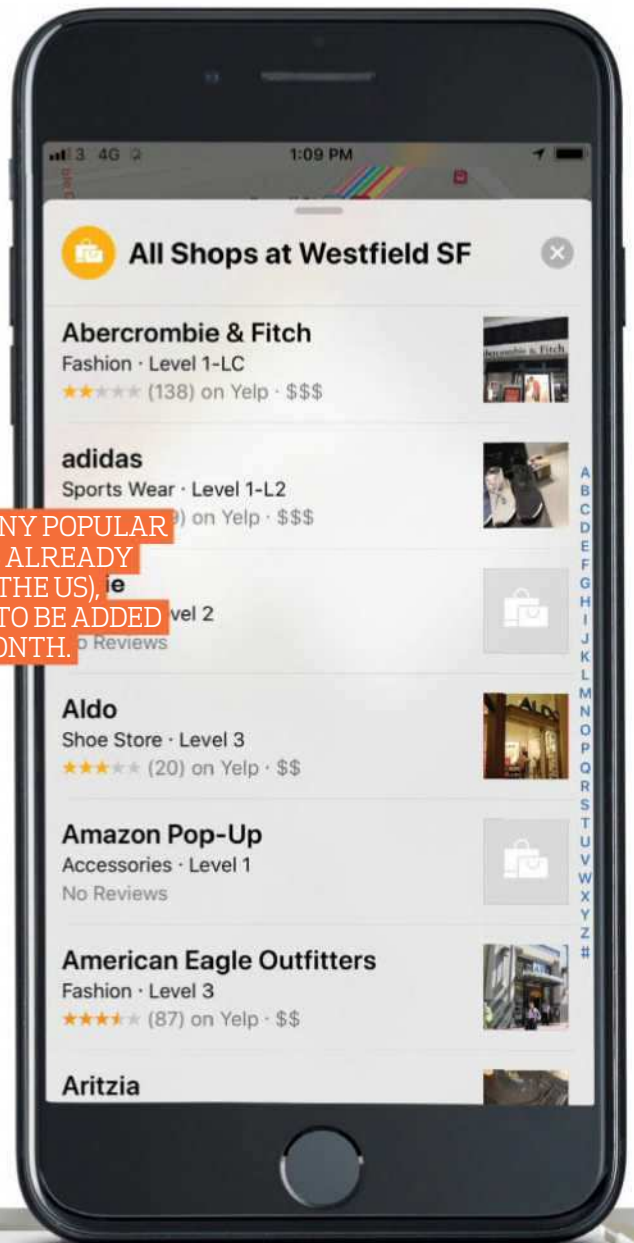
DO NOT DISTURB WHILE DRIVING

05 CUT OUT INTERRUPTIONS

Do Not Disturb While Driving (DNDWD) stops notifications popping up when you're driving and distracting you from the road, vehicles and pedestrians.

In 'Settings > Do Not Disturb', scroll down to the last three items. The first determines how the feature activates. When it's set to Automatic, your iPhone's Wi-Fi is used to detect the Doppler effect, and DNDWD is turned on if it's thought you're moving in a car.

If you wake your device, you'll see a notification that tells you the feature is active. Open that for an option to override DNDWD if you're a passenger or on public transport.

The feature can be set to enable as soon as your iPhone connects to your vehicle's Bluetooth system, or you can choose to turn it on manually. To do the latter, you'll need to add a button to Control Centre: go to 'Settings > Control Centre > Customise Controls' and tap the + next to DNDWD.

06 SEND AUTO-REPLIES

Your iPhone can reply to let people know why their attempts to reach you are going unanswered. DNDWD's second setting specifies who receives these messages: no one, people you've replied to in the last day, your favourite contacts, or everyone. People in your chosen group can break through DNDWD by sending 'urgent' as a second message. Apple provides a preset response. You can personalise that message in DNDWD's third setting.

PEOPLE IN YOUR CHOSEN GROUP CAN BREAK THROUGH DNDWD BY SENDING 'URGENT' AS A SECOND MESSAGE. APPLE PROVIDES A PRESET RESPONSE. YOU CAN PERSONALISE THAT MESSAGE IN DNDWD'S THIRD SETTING.

07 LIMIT CHANGES

Got a teenager in whom you want to instill a sense of road safety? You can prevent DNDWD's three settings being changed (in the fifth group down in 'Settings > General > Restrictions'). Beware that although this stops changes to the feature kicking in automatically and the message it sends, your child can still override the feature.

NEW FEATURES FOR NAVIGATION

08 SPEED LIMIT INDICATORS

During directions, Maps may show the speed limit for the road you're on. Don't want the guilt trip? Go to 'Settings > Maps > Driving & Navigation' and turn off Speed Limit under 'Show in Navigation'.

09 QUICKLY SWITCH VIEW

You can now more quickly switch between following turn-by-turn directions and an overview of your journey: tap the current instruction at the top of the screen.

10 ORIENT THE OVERVIEW

When you switch to the overview, a compass briefly appears at the top right. Tap it to switch between the top of the screen being aligned to North, or your destination. (When the compass is hidden, tap the map to reveal it.)

11 SHOW RIDES FROM NEWLY INSTALLED APPS

When you ask for directions, Maps can suggest ride-booking apps that are already installed (in 'Settings > Maps', under 'Ride Booking Extensions'). You might have turned this off, perhaps because you prefer to only use those services' apps when they are your only option in a neighbourhood. But you can choose to have ride-booking apps you install in future offered in Maps by default. To do so, turn on 'Show Rides From New Apps' in Maps' Settings page.
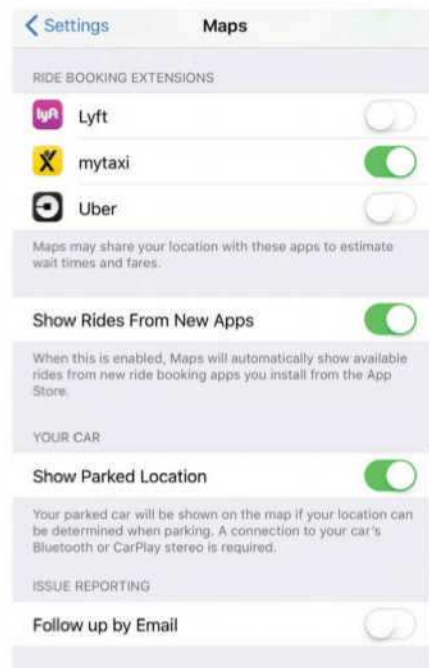
MAKE RICHER NOTES

Apple has improved Notes a lot in recent years. You can already add sketches, checklists and images, and format your text. iOS 11 builds on this with better-organised text formatting options, so text styles, list styles and indentation settings are accessed through more distinctive controls. But what's really cool are the shortcuts that enable you to create notes from the Lock screen, plus all the new things you can add to notes.

QUICK NOTE CREATION

01 START A NOTE
You can tap your Apple Pencil on an empty part of the Lock screen (or use Control Centre's new Notes button) to start taking notes. This shortcut can be turned off in 'Settings > Notes > Access Notes' from the Lock screen.

02 NEW OR RESUME
You can choose to: always create a new note; resume the last note created at the Lock screen, with an optional duration after which you get a new note; or resume the last note viewed in the app, with a passcode timeout.
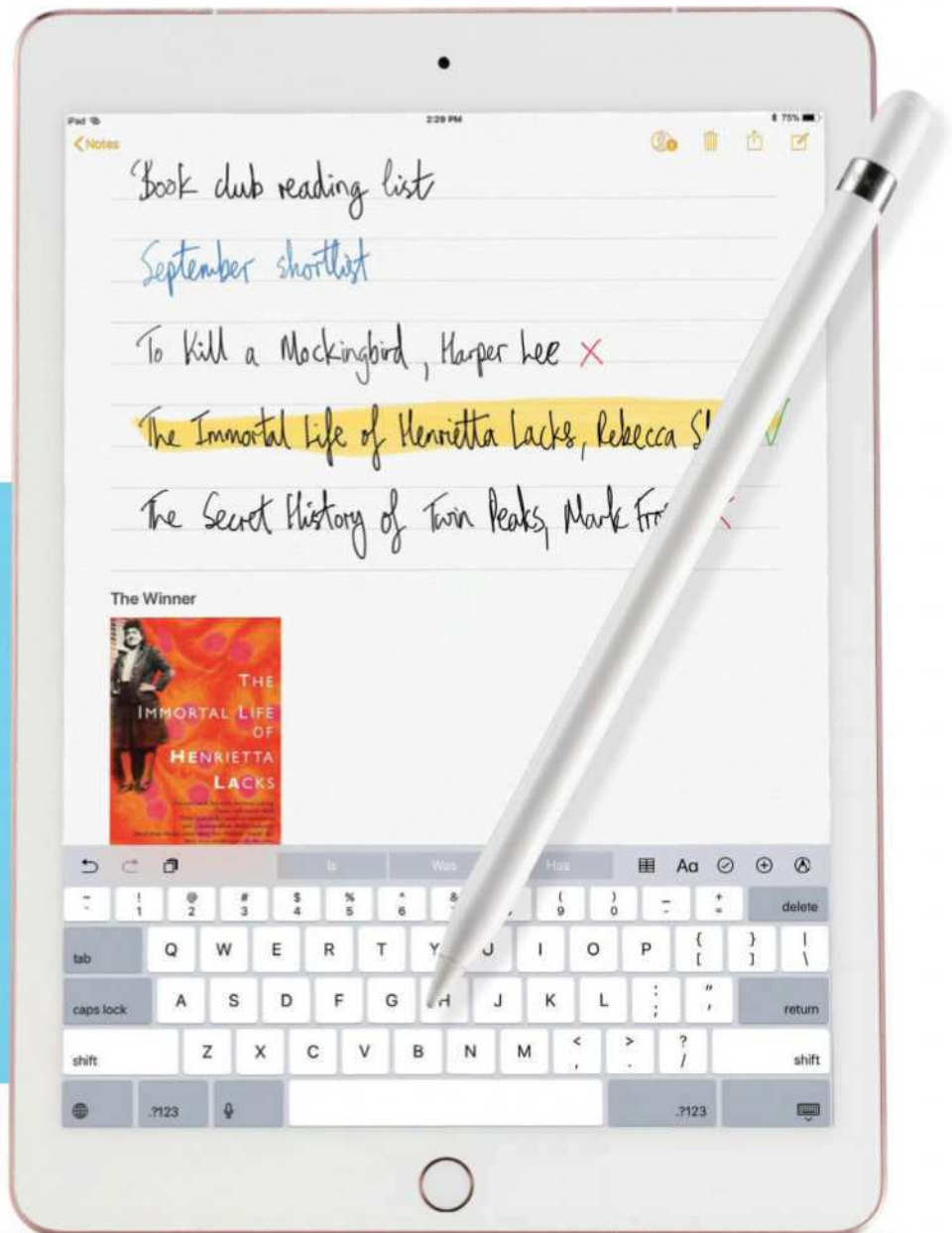
[STEP BY STEP]
WORK WITH TABLES

03 ADD COLUMNS AND ROWS
Tap the table icon to add a table. Tap a cell to the right of or below which you want a new column or row, then tap the three dots above it or at the far left, followed by 'Add Column' or 'Add Row'.

04 FORMAT COLUMNS/ROWS
Tap the three dots above/left of a column/row to select the whole column or row; provided one cell in your selection contains text, the options bar will contain a formatting option, labelled BIU.

05 REORDER COLUMNS/ROWS
Want to rearrange the columns or rows in your table? Hold a finger on the three dots above the column or at the far left of the row to pick up that range of cells, then drag to a new position.

SCAN DOCUMENTS
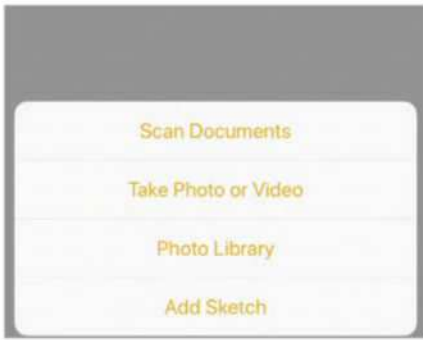
06 START SCANNING

While editing a note, tap + above the keyboard, then 'Scan Documents'. Point the camera at the paper, set against a contrasting background to help the app discern the page's edges.

07 DETECT THE PAGE

A yellow overlay appears over the detected page. It may appear jittery. The shutter is set to auto-take shots by default; switch from auto to manual if you find it triggers too early.

08 FINE-TUNE THE CORNERS

Four handles appear at what the app thinks are the page's corners. You can drag them to adjust their positions. If you're dissatisfied with the shot, tap 'Retake', otherwise tap 'Keep Scan'.

ADD TO AND REFINE YOUR SCANS

09 ADD MORE PAGES

Notes will stash the page at the bottom of the screen, and remain in camera mode for you to add more pages. Tap Save when you're finished.

10 CHECK YOUR SCANS

Tap the scans in your note to take a closer look; the pages should be straightened. Tap + to add more, or the trash button to delete the page in view.

11 ADJUST THE LOOK

Tap the overlapping circles to add a colour, photo, greyscale or black-and-white filter. The crop tool takes you to the original photo to adjust page corners.

MAKE HANDWRITTEN NOTES

12 START WRITING

In a new note or an existing one, after positioning the insertion point, tap the pen icon at the top right of the keyboard. Notes uses the same writing tools as iOS 11's Instant Markup feature.

13 CHOOSE STATIONERY

A background is added to your notes based on your choice in 'Settings > Notes > Lines & Grids'. To override it for any individual note, tap the Share icon, then 'Lines & Grids' in the bottom row.

14 NAME YOUR NOTES

The topmost words added to a handwritten note appear as its name in the list; scroll up past the top of the note to edit that. Tap 'Find in Note' in the Share sheet to search your written text. ∎

WINNER
TECHlife
ED's CHOICE
AWARD

WINNER
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ED's CHOICE
AWARD

[SUPERGUIDE]

Car and vehicle mounts

SMARTEN UP YOUR CAR AND STAY LEGAL WITH A MORE CONVENIENT MOUNT FOR YOUR SMARTPHONE.

[JOEL BURGESS]

WITH MANY STATES around Australia prohibiting the hand-held use of smartphones in the car, mounts are one of the most essential optional-extras you'll have to consider buying for your vehicle. While not exactly a big ticket item, it can be a little bit of a minefield attempting to purchase a mount that'll work perfectly in your car without first knowing a bit about what types of mounts work best in various scenarios. The most obvious are the windshield-mounted suction arms which do a good job of holding your smartphone at the right level for easy viewing, but are generally a little too far away to easily reach and have an annoying tendency to lose suction and fall off every now and then. Alternatively, you have the also easy-to-install vent mounts which are much more reachable than most windshield mounted options, but tend to sit below your natural field of vision when driving.

HOW WE TESTED

Car mounts were installed as directed in an old, low-tech car and were used over a period of days to test for positioning, ease of use and reliability.

[DASHBOARD MOUNT]

Cygnett MagMount 360

THE PERMANENT PHONE MOUNT SOLUTION.

SMARTPHONE CAR MOUNTS are either low-risk options that have at least one limitation or risky non-removable adhesive based solutions that offer considerably more convenience, but which won't work in every car and can't be reused. The Cygnett MagMount 360 sits firmly in the latter camp, requiring you to both glue the single-stick mount in the perfect position on your dashboard the first time and then stick another metal disk to the back of your phone. For anyone using a phone case and wanting their devices to retain the potential for effective wireless charging and NFC capabilities, then there is also the option to simply slide the metal tag between your smartphone and its case, instead of fixing it to the body permanently. In either case, the magnetic mount scenario offered by the MagMount 360 is considerably more convenient than spring-loaded arm mounts and the sticky, dash-mounted base is far more stable than the vent mounted solutions. If your dashboard is the right shape to stick you phone onto it, this is undoubtedly the way to go.

5

CYGNETT MAGMOUNT 360
$29.95
www.cygnett.com

CRITICAL SPECS
Adhesive dashboard mount; magnetic clasp;
1 x large sticky metal disk;
1 x small sticky metal metal disk,
1 x metal tag (for smartphone case)

[VENT MOUNTS]

Cygnett MagMount 360 Vent

MAKE YOUR SMARTPHONE FLOAT ON AIR.

WHILE IT MIGHT feel a little unnatural to put a magnet near your smartphone, most of the metal in it is small enough to not be affected by the force. LED screens aren't disrupted by magnetic fields and memory in today's smartphones is less vulnerable to the effects of external magnets. This means that, despite what you might naturally feel, magnetic mounts are actually an exceptional way to quickly and easily mount your phone in your car. The MagMount 360 is of this magnetic variety and pairs with an air vent attachment to bind it to the car, similar to Satechi's Magnet Vent Mount, right. The MagMount 360 has a few features over its competitor, however — using a spring loaded clamp system to bind to the car's horizontal vent-blades, giving you some control over the direction of airflow on vents that point air using vertical blades. In addition to this, Cygnett's mount also offers some tilt adjustment to the phone support surface, giving you much more control over how your phone sits. If you're set on a vent mounting system, then this is the one to get.

4½

CYGNETT MAGMOUNT 360 VENT
$29.95
www.cygnett.com

CRITICAL SPECS
Air-vent mounted; magnetic clasp;
1 x large sticky metal disk;
1 x small sticky metal metal disk;
1 x metal tag (for smartphone case)

WINNER
TECHlife
APPROVED
AWARD

[VENT MOUNTS]
Satechi Magnet Vent Mount
A MINIMALISTIC MAGNETIC MOUNT.

AVAILABLE IN ALUMINIUM or jet black colouring, the Magnetic Vent mount from Satechi is one of the more stylish and discrete car mounts we've tested in the roundup. Being nothing but a small weighted disk and four rubber-coated vent mounting prongs, this little squid-like structure wraps its metal tentacles around your air vent to stabilise itself. While it might not seem like much, the structure of the vent mount can drastically change the overall stability, with options that simply bind to the horizontal blades allowing you to at least regain some control over the vent's direction when in use. Even in the best case scenario, air vent-attached smartphone mounts tend to be less than ideal (the devices really should sit on the lower half of your windscreen, to allow you to see the road with your peripherals when you are looking at the device) and Satechi's solution will suffer a similar fate on most cars. There are undoubtedly some caveats to vent-mounted solutions, but as far as these mounts go, the Aluminium Magnet Vent mount is hard to fault.

[VENT MOUNTS]
Moshi Car Vent Mount
SAY 'MOSHI MOSHI' TO AN EASY MOUNT.

GOING WITH THE low-commitment design of replaceable vent mounting and versatile grip fastening, Moshi has made its Car Vent Mount one of the least divisive mounts on the market. While this will undoubtedly work well for those impulse buying a device on the shelf and greatly broaden the market that the mount will be useful for, it also settles on two car-mounting technologies that aren't leaders when it comes to convenience. The Moshi Car Vent Mount isn't the stiffest spring-loaded arm grip we've tried, but it'll still require two hands to insert your phone into it — a system that seems archaic against the magnetic mount alternatives. Then there's the fact that you'll have to accept edge air-vent placement, since it doesn't offer a stabiliser or a chock system to keep the vent from pivoting under the added weight of a smartphone, so you have to wedge it against the bottom edge to keep it level. That said, the Moshi Car Vent Mount is a versatile device that provides a cheap and easy solution to mounting your smartphone in the car.

[WINDSCREEN MOUNT]
Lifeproof LifeActiv Suction Mount with Quickmount
THE NOT-SO-QUICK MOUNTING SOLUTION.

THIS IS THE only windshield-based smartphone mount we tested that has two points of movement (one at the base and the other at the phone connection) allowing it to adapt to any windshield angle and put the smartphone at the best height you can get with your windscreen shape. Integral to this mount is a proprietary quickmount system requiring you to glue a toggle to your smartphone or case that'll let you securely mount it quickly. If you are interested in any of the other mounting systems from Lifeproof's range (there's a running band, a bike mount and a belt clip available), then using this sturdy system across multiple arenas makes a lot of sense. But for use just in the car, the Lifeproof Quickmount clip is a little too cumbersome. The clip is far bulkier than the magnetic plate attachments of competitors, and while it offers notably more stability than a magnetic mount, it feels unnecessarily fiddly as a result. That said, it's a great system if you'll use it alongside any of the other mounts in the range.

4
SATECHI MAGNET VENT MOUNT
$29
satechi.net

CRITICAL SPECS
1 x metal stick disk;
1 x metal case tag for magnetic mounting;
3.3 x 2.7 x 2.7cm; 35g

3½
MOSHI CAR VENT MOUNT
$35
www.moshi.com

CRITICAL SPECS
5-9cm grip for phones up to 6-inches;
rotatable hinge; 41g

3½
LIFEPROOF LIFEACTIV SUCTION MOUNT WITH QUICKMOUNT
$40
www.lifeproof.com

CRITICAL SPECS
Windshield mounted;
2 x sticky clips with adhesive; 13.3cm long; 108g

[SUPERGUIDE]

Go cable-free with a wireless phone charger

WE TEST FIVE WIRELESS PADS TO FIND OUT WHETHER IT'S FINALLY TIME TO DITCH THOSE MESSY CHARGING CABLES.

[DAN GARDINER]

THANKS TO APPLE'S integration of Qi-compatible wireless charging tech into its latest iPhones, there's been a lot more interest in this mode of charging, which does away with the need to plug a cable into your phone. Select Android handsets have supported the wireless option for several years now, which uses magnetic induction and very close physical proximity to essentially transfer power through the air.

That may sound like magic, but it does come with some caveats. The main trade-off is speed. A typical Android phone with fast charging takes around 90 minutes to fill up, but with wireless charging, you can basically double that at a minimum. We've also found that phone placement on the pad can cause quite noticeable variations in charging speed.

If you use a phone case, you're likely wondering if that could interfere. The answer is largely no: most chargers will let you use a case up to 3mm thick.

So is it worth going wireless to save the few seconds it takes to plug in a cable and clear up that unsightly cable mess?

HOW WE TESTED

We initially ran a series of tests on a Samsung Galaxy S9+, recharging each from 10% to 100% and using the AccuBattery app to track exact charge performance. However, after we ran some control tests without AccuBattery, we discovered the app was interfering with the wireless charging, causing speeds to be erratic. As such, we re-tested each device from scratch using a Samsung Galaxy S8, and also performed some 5-minute tests with an iPhone X to determine which pads could provide the 7.5W maximum that Apple phones support.

Where a charger didn't include a wall plug (as was the case with the EFM and Cygnett models), we used the Samsung fast charger from a Galaxy S8.

3SIXT Quick Charge Wireless Charger

COMPACT, CAPABLE AND QUICK-ISH.

THIS RELATIVELY COMPACT unit isn't the sleekest, with a glossy black finish that's oddly juxtaposed against four curved rubber treads on the top — although those do keep bigger phones quite firmly in place.

There's a small LED light on the front to indicate whether a device is charging or not. To 3SIXT's credit, the company has included a Qualcomm Quick Charge 3.0 USB plug adapter in the box, which can provide up to 3A or 12V of power output, meaning that (in theory) any device should be able to draw its maximum supported amount of current from it. However, this charger's small size actually placement a bit tricky.

Charging speed with our Galaxy S8 was a fair bit better than the Cygnett and Belkin pads, taking 3:29hr to complete. On the other hand, we found the iPhone X charging performance erratic, with the phone drawing anywhere between 6.5W to 10.5W — the latter is 3W above the X's theoretical top wireless charging speed, and it even ran at that rate continuously for 5 minutes before we pulled it off in the interest of caution.

3SIXT QUICK CHARGE WIRELESS CHARGER
$80
www.3sixtgear.com

CRITICAL SPECS
Qi fast charging up to 10W;
USB charge adapter included (max output 12V@1.5A); 8.6 x 8.6 x 1.1cm; 54g

Belkin Boost Up Wireless Charging Pad

BIG AND BEAUTIFULLY FUNCTIONAL.

THE BOOST UP Wireless Charging Pad is quite big, which makes it more suitable for use with larger phones and, more generally, makes it easier to just plonk your phone down and find the fast-charging sweet spot. Belkin's used an integrated plug adapter here, so you don't need to recycle your phone's one — handy if you want to save the latter for fast-charging via a cable when you need it.

The Boost Up's charging indicator is also quite subtle, with a small dot LED on the top of the device.

In terms of charging performance, this pad started off well, with our Galaxy S8 pulling close to its max rate of 10W — although that did drop down to just 5.5W for much of the charge time, with occasional jumps back up to 9.7W, but usually only for a minute or two. Still, its overall speed matched the average, at 3:49hr total. It offered very consistent iPhone X charging performance, where it pulled a steady 7.5W at maximum. Our only real gripe is the price: $99 makes it one of the more expensive wireless chargers around, but then the quality does largely justify it.

BELKIN BOOST UP WIRELESSV CHARGING PAD
$99
www.belkin.com/au

CRITICAL SPECS
Qi fast charging up to 15W;
non-removable power adapter; 11.8 x 11.8 x 1.1cm; 110g

WINNER
TECHlife
APPROVED
AWARD

Laser The Hills Wireless Charging Dock

SLOW AND STEADY CAN STILL WIN THE WIRELESS RACE.

THIS DOCK IS easily the biggest we tested — but that's because it's designed to juice up to five devices simultaneously. Only one of those can actually charge wirelessly, however — the other four will need to be plugged in using the USB sockets on the dock's right-hand side, and can then be conveniently propped up in between those plastic fins, which were sturdy enough to support a 10.5-inch iPad. The whole top is covered with a thick silicon rubber layer, which should keep phones or tablets from getting damaged, too.

The catch — a deal-breaker for some — is that it has zero fast-charging capabilities on the wireless pad. In use, however, that actually made less of a difference than you might expect, with the dock turning in the fastest S8 charging speed, taking just 3:13hr. It may not be able to pump out 10W, but it set a good steady pace of around 7W. Moreover, the USB ports are all output up to 2 amps, so they're capable of charging larger devices.

This is potentially a great option for demanding multi-device households.

Cygnett PowerBase Wireless Desk Charger

MIGHT BE A BIT TOO SLEEK FOR ITS OWN GOOD.

THIS SLIM AND subtle charger lives up to its 'Desk' moniker thanks to its sleek and low design. There are a couple of things we didn't like about the design, however. First off, with our Galaxy S8, we found the fast-charging sweet spot was quite small — and even within that zone, moving the phone up or down slightly showed a range of 6W–10W. Making that situation worse is the fact that the pad itself is quite slippery — even a slight bump to our test phone would cause it to slip out of that sweet spot and sometimes stop charging altogether.

There are two nice bright indicator strip-lights on the top of the charger. It's worth noting that those lights are always on, regardless of whether you've got anything charging, so it's perhaps not something you'd want sitting on your bedside. The PowerBase's lower price does mean there's also no plug adapter in the box, so you'll need to bring your own.

Its ultimate charging performance was at least adequate, taking 3:48hr to recharge our S8, and delivering up to 6.8W to our iPhone X.

EFM Wireless Charge Pad

A MEDIUM-SIZED PAD WITH SOME FAST-CHARGING HICCUPS.

EFM'S WIRELESS CHARGING Pad is one of the clearest when it comes to indicating it's charging status: there's a bright blue LED ring that goes around the whole outside edge, making it super easy to see when your device is correctly placed. The light does switch off completely when you're not charging anything though, unlike most others here, and there's a useful soft silicon rubber coating on the top, which will help prevent phone damage or slippage. The pad is a medium-sized model, so you don't need to be too precise with phone placement. Like the Cygnett, left, however, this one's lower price seems to have come at the cost of including an actual charger in the box.

The EFM's charging results were good on our Galaxy S8 test, taking 3:28hr to completely charge — one minute faster than the 3SIXT. It also charged our iPhone X at a stable 6.9W, so it's competitive for Apple devices too.

This one's a good option for those who have bigger plus-sized phones — and don't mind the compromise of having to re-use your own charger. And hey, at least that'll save you a few dollars too…

4

LASER THE HILLS WIRELESS CHARGING DOCK
$90
www.laserco.com.au

CRITICAL SPECS
Qi charging support; 4 x 2A USB ports; 22 x 14.7 x 7.8cm; 560g

3½

CYGNETT POWERBASE WIRELESS DESK CHARGER
$60
 www.cygnett.com

CRITICAL SPECS
Qi fast charging up to 10W; USB A-to-micro-B cable included; 10 x 10 x 0.5cm; 75g

3½

EFM WIRELESS CHARGE PAD
$70
myefm.com

CRITICAL SPECS
Qi fast charging up to 10W; USB A-to-micro-B cable included; 10 x 10 x 2cm; 70g

[SUPERGUIDE]

Gain some gigs

EASILY ADD STORAGE SPACE TO YOUR SMARTPHONE.

[JOEL BURGESS]

FOR ANYONE OTHER than Pixel or iPhone users, microSD cards are a pretty common feature in today's smartphones. Some vendors have even made the microSD interface fast enough to enable the storage of system applications on the removable flash cards. So while storage space isn't the universal smartphone problem it used to be, modern phones are able to take much higher-quality photos and videos that take up a lot more space.

It's worth pointing out that you'll probably want to use a fast microSD card for expanding your smartphone storage, since there's a high likelihood your device will have a camera capable of taking large photo and video files that require faster-than-average flash storage in order to function. Even if your camera can't film in 4K just yet, you'll be able to keep your microSD card and transfer it to your next phone, so the additional cost of future-proofing is well worth it in this instance.

If you do happen to be one of the many who use a phone without an expandable memory slot, don't despair: there's a number of dual-sided USB drives that'll plug directly into your device if you want to carry large media files or games that don't fit on your smartphone, so you can use them on the go. If that isn't enough, then you've also got the option for wireless HDDs and portable SSDs to really boost the size of your smartphone capacity to unprecedented levels.

[BEST IOS DUAL DRIVE]

Transcend JetDrive Go 500G

TRANSCENDS THE LIGHTNING BARRIER.

WEIGHING IN AT 5g, the JetDrive Go 500G is one of the most compact dual USB drives we've come across. Coated in imitation gold and squeezing into a compact USB form factor, this dual drive adds a curve to the centre of the device in order to fit a keyring loop. The dual USB comes with a cap for each end and a leather keychain lanyard that won't look out of place on fancy keyrings.

The JetDrive Go 500G was the fastest flash drive in sequential Q32T1 write tests netting 99MB/s, while also maintaining a decent 120MB/s sequential Q32T1 read speeds. As the step-up from the JetDrive Go 300, this isn't overly surprising, but you will have to be prepared for 20MB/s speeds when using the Lightning connection to transfer, play or back-up files using the USB.

That said, the software that accompanies the Jet-Drive Go 500G is easy to use and does everything you could realistically expect. With sale prices dipping as low as $60, this fast dual drive is actually reasonably priced if you need to tack on a little extra storage to your existing device.

[BEST MICROUSB DUAL DRIVE]

Samsung USB 3.0 Flash Drive Duo (32GB)

A DAINTY, DOUBLE-DIPPABLE STORAGE DRIVE.

WHILE TYPE-C USB ports are increasingly being introduced on newer smartphones, micro-USB still remains relevant for a number of Android-based devices. Samsung's Flash Drive Duo is a neat little unit that doesn't take up much more space than the minimum space needed to fit the two interface adapters. A single cap, attached to the microUSB end, features a small string hole to attach the unit to a set of keys.

There are a few elements that Samsung has made the drive impervious to, including: water, shock, magnet, extreme temperature and X-ray proof, guaranteeing these with a 5-year warranty. If you have the space to attach both ends of the drive, then you can use the device for charging and direct transfers, in addition to the usual independant storage functionality.

Considering you can pick it up for less than $30 and that the transfer speeds are what you would expect from a USB device, this is one of the best value options for expanding your smartphone storage.

3½

TRANSCEND JETDRIVE GO 500
$60, 32GB; $83, 64GB
www.transcend.com

CRITICAL SPECS
Lightning / USB 3.1 Type-A;
37 x 14 x 9mm; 5g

4½

SAMSUNG USB 3.0 FLASH DRIVE DUO (32GB)
$30
www.samsung.com

CRITICAL SPECS
USB 3.0, micro-USB type B;
37 x 16 x 6mm; 5.2g

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[4K MICROSD CARDS]

SANDISK ULTRA MICROSD UHS-1 CARD

SANDISK'S ENTRY-LEVEL ULTRA HIGH SPEED CARD.

From 32GB $29 | www.sandisk.com.au

With PC read speeds sitting just under 100MB/s, SanDisk's 4K video capable Ultra UHS-1 micro SDXC card is a good balance of speed and value. The first tier of the Ultra High Speed class will allow you to take 4K footage at a maximum of 30fps. While some of the latest phones can take this quality footage at faster frame rates, it's a reasonable speed for backup phone storage.

4

SAMSUNG EVO PLUS

A NEW EVOLUTION OF MICROSD.

From $44, 64GB | www.samsung.com

The Samsung Evo Plus range is a great example of the progression that microSD cards have had in the last year and why you shouldn't consider buying an older card. The Evo Plus range has jumped a UHS speed class and boosted from 10MB/s minimum image write speeds to above 30MB/s minimum rates for no extra cost. Interestingly, the cards we've seen on clearance have not only been slower than this year's equivalent capacity cards, but were also up to twice the price.

4½

VERBATIM PREMIUM MICROSDXC

A SLIGHTLY PRICIER MICROSD CARD.

From $59 | www.verbatim.com

With a UHS-1 rating, this card is more than capable of adding some speedy storage to your smartphone, but Verbatium's offering isn't as competitively priced as the other offerings here. The 64GB capacity will set you back $59, more than $15 over Samsung's new, faster Evo Plus cards. If you want UHS-3 class speeds, then you'll have to jump to the Verbatim Pro microSD which retails for $99. On the whole, though, it's still an affordable way to add some speedy storage to your smartphone if it has a microSD card slot.

3

[BEST MOBILE USB-C DRIVE]

Samsung T5 Portable SSD

HIGH FIVE FOR SAMSUNG'S SOLID STATE DRIVE.

SAMSUNG'S T1 AND T3 drives were some of the first portable SSDs to get the company's V NAND layering technology, pushing read and write speeds above the 200–300MB/s threshold of traditional flash-based storage. A lot of the market has now caught up, but the T5 is still well above average when it comes to speed and isn't as expensive as many competitors.

While the 437MB/s and 444MB/s sequential Q32T1 read and write speeds are impressive, the T5 is also exceptionally compact, lining up with the footprint of WD's SSD offering, right. This makes it easy to consider carrying it in your pocket as extra storage space for your smartphone. The card-sized unit also manages to pass the 2m shockproof drop test, at least under controlled conditions in Samsung's lab, competing with some the durability features of rugged SSDs. The T5 is barely 10% faster than the T3, but it's come down significantly in price since launch, so it's hard to see why you wouldn't go for the newer model.

5

SAMSUNG T5 PORTABLE SSD
From $177
shop.samsung.com/au

CRITICAL SPECS
250GB, 500GB, 1TB and 2TB models;
USB 3.1 Type C to A and C to C cables;
7.4 x 5.7 x 1.1cm; 51g

[BEST PORTABLE SMARTPHONE SSD]

WD My Passport SSD

YOUR TICKET TO SPEEDIER STORAGE.

WESTERN DIGITAL HAS a strong footing in the portable HDD space, but it was a little behind Samsung getting into SSDs. That said, WD's My Passport SSD has been around for more than a year now and it more than holds its own in this space.

While it doesn't seem to be quite as fast as Samsung's T5, with read and write speeds of 390.1MB/s and 385.4 MB/s in the SSD-oriented sequential Q32T1 speed tests, the My Passport SSD is only about 10% slower, and is actually faster than the T5 in other types of data transfer tests. In real-world use, the difference would be negligible.

The My Passport SSD borrows the dual textured exterior of the larger My Passport range and offers both USB 3.1 Type A and C cables to connect directly to your computer or smartphone.

On average, street prices for the WD My Passport SSD are similar to the T5, but you can get it for even less if you're willing to do a bit of research.

5

WD MY PASSPORT SSD
From $169
www.wdc.com

CRITICAL SPECS
256GB, 512GB and 1TB capacities;
USB 3.1 Type C to A and C to C cables;
9 x 4.5 x 1cm; 40g (without cable)

WHAT'S THE NEXT
MUST-HAVE
ON YOUR GADGET WISHLIST?

WAIT NO MORE. GRAB THAT LATEST TECH WITH GREATEST SAVINGS.
WWW.GETPRICE.COM.AU

GETPRICE

[SUPERGUIDE]

Smartphone case roundup

WHETHER YOU PREFER A ONE-PIECE, A TWO-PIECE, SOMETHING MADE FROM LEATHER OR SILICONE, THERE'S A PHONE CASE JUST FOR YOU!

[PAUL TAYLOR, SHARMISTHA SARKAR, HARRY DOMANSKI & JOEL BURGESS]

WEAPONS GRADE TECH

A GADGET BEING 'MILITARY GRADE' DOESN'T MEAN IT CAN DRIVE A TANK…!

You may have comes across the term 'Military Standard MIL-STD-810G Tested' when browsing new tech, but do you know what it means? Well, in 1965, the US military devised a series of tests to evaluate the durability of essential equipment. These hardcore tests have since been commandeered by the tech world. They focus primarily on a product's drop and shock limits, but also include extreme temperature, humidity and durability. A lot of the cases here sport the tag, and they're a lot stiffer and bulkier than the rest. However, the term is a little nebulous due to the cost of the testing, and some manufacturers (not insinuating the ones here) can stretch the truth. Your best bet is to check the box and see which part of the military standard the case adheres to. The Pelican brand, for instance, tests its gear to survive multiple drops.

SO YOU'VE GONE and bought yourself a $1,100-plus handset, and you're terrified of your iPhone, Pixel or Galaxy smashing to pieces or accidentally going for a swim. Or, horror scenario, plopping into the toilet. An understandable fear, as getting the thing fixed starts at three figures, and insurance isn't much better. You're probably also locked into a two-year contract, so it's in your best interest to keep the phone in fine working order.

Those examples aside, you're probably already settled on the idea of a phone case, and it's true that a $5 cheapie from eBay will certainly protect it from scratches and bumps. However, opting for something better (and with a chunkier price tag) from a reputable vendor yields benefits. You're more likely to have a warranty period on the case itself, so if it does degrade or fail, you're covered. That cheap and cheerful number from eBay? Not so much… and they do degrade, as the *TechLife* office is littered with discarded, discoloured and grotty shells from phones in the past. Plus, you get the option of better materials, with one here being made out of hand-carved wood, and a good number with finely stitched leather.

We've rounded up a plethora of cases for the newest, biggest-selling handsets. The majority of these cases are available for their bigger or smaller siblings, and also for the other handsets in this roundup. Our scores for those not tested for a specific handset will vary, though their sturdiness is transferable, and thematically look alike.

SMARTPHONE CASE BUYER'S CHECKLIST

WHAT YOU NEED TO KEEP AN EYE ON WHEN SHOPPING FOR A CASE FOR YOUR MOBILE PHONE.

MATERIAL
Plastic rules for the most part, with lots of silicon cases and a few leather following suit — there's even a wood option. The silicon cases will be kindest to your phone's surfaces, so check if the harder options have a flocked interior to minimise the chance of scratches.

NEW WALLET
More and more cases offer a few card slots for your debit and credit cards, and photo ID. Some also provide space to stuff in bank notes, so if you're looking to ditch your wallet or purse, make this a consideration.

FOLD INTO A FOLIO
A few cases tested are folios, too, meaning a handy hinge lets them prop upright in the landscape position. Very handy if you commute and want to watch shows or stream YouTube hands free.

PRICE POINT
Our cases here range approximately from $30 to an eye-watering $130. The cheapest offers no impact protection, the most expensive has a built-in screen protector, is water-, shock- and drop-proof. You generally get what you pay for.

DESIGN
Do you mix and match your phone case like you do your jewellery, or are you happy to have a case that will simply *have* to suit all seasons? Do you want to show off your phone's original shape in a thin skin? Black is the default colour, then 'entirely opaque' a close second for total visibility.

GUARANTEE
The Pelican brand of cases offer a lifetime guarantee against the case failing, whereas others vary and some are simply covered by Australian Consumer Law.

IPHONE 8

WINNER TECHlife APPROVED AWARD

WINNER TECHlife ED's CHOICE AWARD

WINNER TECHlife APPROVED AWARD

PELICAN MARINE
$99.95 | pelicanstore.com.au | 51g; MIL-STD-810G cert

So you want to go snorkelling, spelunking or generally drop your phone face down with little fear of it smashing? No other case inspires confidence like this one. Offering a snug fit, this two-piece chassis clicks together to form a waterproof seal, and it looks like a serious piece of kit without any overt chunky bits. Buttons are little tricky to press (especially the mute switch) and your speakers are fairly muffled, but touch ID works and the Lightning port is well sealed. Pretty? No. Effective and rugged? Without a doubt.

5

APPLE IPHONE 8 SILIICONE CASE
$55 | apple.com/au | 45g

Fits like a glove, as you'd expect for the official product, and available in a staggering amount of vibrant colours. The exterior is terrifically grippy in the hand, helped by the frame curling over three edges and around the corners, so if it does take a tumble onto a flat surface, the screen won't take a hit. Bit of a shame that the bottom edge is almost entirely exposed, leaving that border of your phone open to scratches. At least the speakers can still shout loudly. The suede-like interior keeps the chassis scratch-free.

4

MOSHI SENSECOVER
$69.99 | moshi.com | 9g; MIL-STD-810G cert

The brushed metal aesthetic disguise your phone's clean lines, but it's a fine solution for anyone who wants to hide the majority of their screen while protecting it from bumps and scratches. A small magnetic clasp keeps the cover in place, and the four horizontal lines on the front can be swiped to answer incoming calls. You can also turn this into a folio for movies, making it a very tidy and well-priced case.

4

BODYGUARDZ ACE PRO
$49.95 | au.bodyguardz.com | 35g; 3m drop rating

Features the same slim profile as the official case, but this is rated to a 3m drop, and the bottom of the case provides a lot of protection, so you're covered from all angles. We're a bit dubious about the minimal clearance of the screen, but the case professes to stop scratches if your phone lands face down. All the buttons are easy to press, apart from the mute switch, which needs a fairly dainty finger and decent finger nail to access.

3½
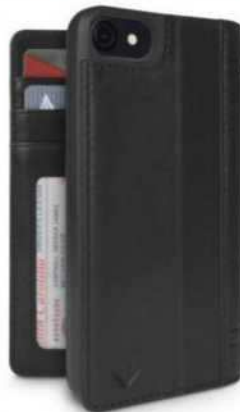
TWELVE SOUTH JOURNAL
$99.95 | www.twelvesouth.com | 68g

From the outside, it looks like a classic leather, er, journal, with a stitched spine and premium material. You can stash two cards and ID, plus banknotes, on the inner cover, and the frame has a lip, giving a small amount of clearance should your phone fall down with the flap open. Power and volume buttons are surreptitiously hidden which numbs their feel, so you'll have to give them a good push. You can prop this up and make it into a folio style if you want to watch a movie, though it won't lock into place, and the price isn't agreeable.

3½

OTTERBOX COMMUTER
$49.95 | otterbox.com.au | 48g

A slightly confusing two-layer design proves for an interesting look, but it ultimately seems superfluous, and a little irritating to properly align. The softer inner layer provides grip around your buttons on either side, and also acts as cover for the lightning port, while the polycarbonate outer layer inspires confidence for butterfingers. Don't go thinking its waterproof, though it'll keep fluff and dust out of the port. Ultimately, it's just a little bit too chunky, adding nearly 2mm to the depth of your phone.

2½

IPHONE 8 PLUS

WINNER TECHlife APPROVED AWARD

LANDER MOAB

$59.95 | www.lander.com | 48g

We're shocked we don't see more of this: phone cases with the choice for a lanyard. The lanyard has plenty of give so you can still take photos and operate one-handed. Lander says this case protects from extreme temperatures, but that only covers the rear, not the sides or the screen so the claim seems dubious. Still, it's rugged and offers great protection all round, and is worth considering if you go off the beaten track and don't mind a chunky case.

4

WINNER TECHlife APPROVED AWARD

OTTERBOX STRADA FOLIO

$84.95 | otterbox.com.au | 82g

Mixed materials can result in a lumpy look, but Otterbox has got the balance right here. Their leather folio case offers a good amount of grip on the edges and good protection along every border, without obstructing ports or speakers. While there's a generous lip around the edge, the cover snaps shut thanks to a magnet, and the inner flap only has a single slot for a card or money. Buttons are easy to get to, and it's beautifully weighted, too.

4

WINNER TECHlife APPROVED AWARD

PELICAN ADVENTURER

$39.95 | pelicanstore.com.au
32g; MIL-STD-810G cert; 1.2m drop protection

This is a see-through silicon case that comes in at $20 cheaper than the Apple alternative, and still shows off your phone's original colours. The Adventurer professes military grade protection, and all four edges are nicely covered, and it feels nice and grippy. There are multiple colour options around the trim for that extra layer of personalisation, too.

4

CYGNETT CITIWALLET

$69.95 | cygnett.com | 82.7g; 3x card slots

Another leather folio case, though the Pelican feels nicer to hold and use. The trade off is two more slots for cards and ID, a banknote slot, and it's $15 cheaper. It's also a folio, but the cover is likely to flap around a little when you hold it, as it's not magnetised. Worth looking at, especially for the card slots.

3½

CYGNETT ORBIT

$34.95 | cygnett.com
40.2g; 2.4m drop height; wireless charging support

The Orbit provides a very stiff shell which is great for protecting your $1.4K smartphone, but the interior of this simple case isn't particularly forgiving. It won't scratch it, but it won't do it any favours either, especially when compared to other cases with a flocked lining. It's also a bit slippery on the rear.

3

CYGNETT URBANSHIELD

$49.95 | cygnett.com | 31g

The UrbanShield is a step up from a silicone case in terms of strength, but it's just as simple with no front cover. A carbon fibre rear offers stiffness and great scratch protection, though the weave effect looks like an optical illusion. We like the raised bezel, the buttons are easy to press, and both camera and mute switch aren't obstructed. There are better options for the price, though.

3½

IPHONE X

WINNER
TECHlife
ED's CHOICE
AWARD

WINNER
TECHlife
ED's CHOICE
AWARD

WINNER
TECHlife
APPROVED
AWARD

3SIXT NEOCASE

$34.95 | 3sixtgear.com
114g; genuine leather; 3 card holders; magnetic clasp

If you can't decide between a wallet case and a hard one, try something that gives you the best of both worlds. The 3SIXT NeoCase is a 2-in-1 made from genuine leather and magnetised. It's easy to slip the iPhone X in and out of the inner shell, which in turn comes off the main case to be used separately. Or stuff your cards and some money in there and use as wallet case.

4½

CYGNETT ELEMENT

$49.95 | cygnett.com | 30g; genuine leather with aluminium highlight; soft-feel edges

Leather with metal highlights add a touch of a class to Cygnett's Element cases. Not only do they look great, they're slim enough to not add to the iPhone X's size, yet manage to protect the all-glass form, thanks to its raised bezeled edges. The brushed aluminium highlight doesn't attract fingerprints and the soft moulding on the buttons give a satisfying feedback and require no extra effort to use.

4½

CYGNETT STEALTHSHIELD

$29.95 | cygnett.com | 37.33g; 2.4m drop protection; scratch-proof shell; matte finish

Cygnett's StealthShield marries simplicity with toughness. With the ability to protect your phone from up to 2.4m, the StealthShield's matte finish keeps grimy fingerprints away from the tough back plate. Plus, there's easy access to the buttons, thanks to softer edges. And the case won't get in the way if you use wireless chargers.

4

WINNER
TECHlife
APPROVED
AWARD

EFM ASPEN IMPRESS

$57.95 | myefm.com | 35g; anti-UV and anti-scratch coating; D30 patented technology; 1.8m drop protection

The EFM Aspen Impress adds a touch of flair to a case that's manufactured using patented D30 shock absorbing material that will keep your all-glass iPhone X body safe even when dropped from a height of 1.8m. Unlike a lot of hard cases, the Aspen Impress has moulded soft edges that makes it easy to use the side and volume buttons, plus an anti-scratch and anti-UV polycarbonate back plate.

4

BODYGUARDZ TRAINR PRO

$74.95; 87g | www.bodyguardz.com
3m drop rated; clip-on case, includes strap

Being able to clip your phone on and off an armband, case and all, when you want to head off for a run doesn't come as easy as the Bodyguardz Trainr Pro case. While it's something most runners will appreciate, the raised rubber edges of the case makes reaching the side button somewhat hard. That said, the case is light and shows off the iPhone X in all its shiny glory and the armband is comfortable.

3½

OTTERBOX SYMMETRY

$59.95 | otterbox.com.au | 52g

While the Otterbox Symmetry adds a much-needed layer of protection to the very expensive iPhone X, it does make the the handset rather bulky. And although the raised beveled edges provide some protection for the touchscreen, it makes accessing the home screen by swiping up an uncomfortable gesture. Pressing buttons also require a tad more effort. Despite that, the case is lightweight and looks good.

3½

GOOGLE PIXEL 2 & 2XL

BELLROY LEATHER CASE

$59/$69 | bellroy.com | 22g/25g

The Bellroy comes in a variety of colour options for both Pixel 2 phones, and looks stunning for the price. The leather on its back is supple and smooth, transitioning into matte plastic running around the trim. Bellroy's case doesn't provide button extenders, but pushing them in doesn't require any additional effort.

4

GOOGLE LIVE CASE

$69 | store.google.com | 41.2g/48.8g

Every angle of the Pixel 2 is protected, including the camera and screen, by a silicon case surrounded by tough shell. The buttons feel nice to press and better yet, the Live Case functionality is interesting. Your phone's wallpaper can match the look of the customisable case by downloading the Live Case app and putting in the supplied code.

4

KERF WOOD CASE

From $75 | kerfcase.com | 31g

Ah, yes, wood — that's what your Pixel 2 is missing. Kerf makes its own phone cases by hand, complete with a flattering design, and backs it with a lifetime warranty. Even the low-end walnut option is a great choice, as the buttons are responsive, the suede inside cradles the form factor perfectly and, oddly, it just smells good.

4

GOOGLE FABRIC PHONE CASE

$59 | store.google.com | 23g/26g

Google's microfibre case does well at maintaining the slim look and feel of the Pixel 2s. All of the buttons are effortless to push, and the case raises the phone's front so that the glass display isn't grazing any surfaces. Unfortunately, the bottom near the charging port isn't protected on the front, which encourages scratches.

3½

PEEL SUPER THIN

$32.11 | buypeel.com | 23g/25g

The trim and thin Peel snaps right on and hugs your phone's curves without adding extra bulk, but doesn't agree with turmoil, so look elsewhere for shock protection. It prevents micro-scratches, but it likely won't prevent damage from a drop, and in the case of the Pixel 2 XL, its curved glass isn't protected in the slightest. Cheap, though.

3½

LIFEPROOF FRE

$129.95 | lifeproof.com.au
45g (2XL); IP68; MIL-STD-810G cert

The FRĒ is Lifeproof's flagship case and sports the full gamut of water-, dirt-, snow- and drop-proof protection. While it's the only option from this manufacturer that offers waterproofing, this only bumps the Pixel 2's IP67 rating up to IP68 at the expense of a much bulkier phone, awkward fingerprint-scanning, near-impossible to press buttons, and neutered EdgeSense (squeezability).

2½

SAMSUNG GALAXY S9

WINNER
TECHlife
APPROVED
AWARD

LIFEPROOF NEXT

$84.95 | lifeproof.com.au | 47g; MIL-STD-810G cert; IP5X; 2m drop protection; wireless charging support

This is an adventurer's case — in that you won't care too much what it looks like, and feels like it'll survive an avalanche. A two-part chassis with secure plugs for the headphone jack and USB port, it's all hard plastic and smooth surfaces on the back and top, and a grippy rim around the edges. A downside is that the screen nor the camera lens are covered, but there's a decent lip on the top and bottom to avoid a concrete kiss.

4

CYGNETT SKIN

$29.95 | cygnett.com | 25g; wireless charging support

This Skin case is as basic as they come, with a price to match. Shock protection, says the case, though no height was given — so it's probably best not to drop it from any great distance. There's also no structure to it, so the matte silicone case is quite floppy when not slapped onto your phone. It's in no danger of coming off, though, and the raised bezel at the top and bottom are welcome.

3½

PELICAN AMBASSADOR

$49.95 | pelicanstore.com.au | 35g; MIL-STD-810G cert

While the Pelican Ambassador's clear back plate is thin, the edges are thicker, adding width to a slimline phone. That said, it barely adds any weight to the Galaxy S9 and neither does it take extra effort to use the power, volume and Bixby buttons. And the gold detailing on the power button is a classy touch.

3½

TECH21 PURECLEAR

$49.95 | www.tech21.com | 21g; 3m drop protection

For a clear case that's thin and lightweight, the Pure Clear is surprisingly tough. Drop tests indicate your phone will be safe if dropped from a height of up to 3m, plus slightly raised edges gives the touchscreen some protection. And while the back plate is scratch-resistant, it'll be covered in fingerprints in a second.

3½

TECH21 EVOCHECK

$49.95 | www.tech21.com | 31g; 3m drop protection

This is a step up from the PureClear — almost literally, as you get another 3m drop protection — at the expense of gnarly colours that will completely hide the Samsung's chassis. It's thin on the back, at a measly 1.6mm, so you're not going to feel the bulk there, but it's around the edges and corners where you get the most benefit.

3½

PELICAN VOYAGER PRO

$59.95 | pelicanstore.com.au | 103g; scratch-resistant coated screen protector; clip-on holster

If you're extremely protective of your Galaxy S9, the Pelican Voyager Pro will cover your phone with a hard shell, but will also make your phone heavy and bulky. Clipping on the back plate does take some effort as well, but the case comes with a holster which you can use to clip the phone to your belt, case and all, or convert it into a folio stand as shown above. It also comes with its own screen protector.

3

SAMSUNG GALAXY S9+

WINNER
TECHlife
APPROVED
AWARD

WINNER
TECHlife
APPROVED
AWARD

LIFEPROOF SLAM

$74.95 | lifeproof.com.au | 43g; drop-proof;
2m drop protection; wireless charging support

A two-part shell that snaps together over your phone, the Lifeproof Slam offers exceptional protection against drop damage, surviving drops from heights of up to 2 metres. Its reinforced sides will absorb a lot of the impact, while its transparent backing will display your phone's finish (shame the Slam's red and grey edges clash with our purple Galaxy S9+, though).

4

PELICAN SHIELD

$69.95 | pelicanstore.com.au | 64g; MIL-STD-810G cert

Don't be fooled by the torx screws on the carbon fibre rear. This two-piece relies on three clips to hold it together, and they're incredibly sturdy. You could imagine it in action on a building site, save for the exposed camera lens and totally open front screen. Despite that, Pelican has awarded itself triple military grade protection and the usual lifetime guarantee, so you can throw this beastly thing around with little worry.

4

3SIXT NEO CLUTCH

$39.95 | 3sixtgear.com | 157g; leather

Designed primarily for those who identify as female (look, it's a *clutch*, fellas), the leather clutch acts like a purse, with room for your S9+, three cards and banknotes on the inside (a shame there's no window for ID, though). Handily, the whole thing firmly snaps shut, and the protective case also firmly sticks to the clutch shell via magnets. The case can be removed so you're not answering your phone with the clutch attached. We suspect the soft inner liner will get grubby over time, though.

3½

CYGNETT AEROSHIELD

$24.95 | cygnett.com
22g; shock absorbent frame and dual-material structure

The brutal truth is that the Cygnett Skin is not a whole lot different from the clear silicone case that comes in the box with your Samsung Galaxy S9 or S9+. That said, it's definitely of a higher quality, with some plastic reinforcement making it feel sturdier than the included option — particularly around the edges. Our unit had a couple of tiny imperfections, but looks pretty slick regardless.

3½

UAG PLYO

$49.95 | urbanarmorgear.com
40g; MIL-STD-810G cert, wireless charging support

Built from a sturdy sheet of transparent perforated plastic, Urban Armor Gear's Plyo phone case for the Galaxy S9 has a much stiffer back panel than many smartphone cases. This strong plastic backplate is supported by softer suspension-gel edge materials to cushion drops. All up, a protective phone case that doesn't add too much bulk, and with a welcome, simple design.

3½

UAG PLASMA

$49.95 | urbanarmorgear.com
40g; MIL-STD-810G cert; wireless charging support

With plastic bracing seams, soft rubber expansion rivets and blunted compression corners, this case from UAG definitely looks like it would be up to the task of taking a bullet for your phone, perhaps while on a spaceship... The plasma series utilises a three-layer hexagonal core plastic that makes it rather lightweight for a 'rugged' case that's passed the military grade drop testing.

3

A TECHLIFE PRIMER

Keep to the

LEARNING TO CODE IS ONE OF THE MOST EMPOWERING THINGS YOU CAN DO IN TECH. TECHLIFE SHOWS HOW TO DIP YOUR TOE INTO THE CODING POOL AND START WRITING YOUR OWN.

[DARREN YATES]

PCS, LAPTOPS, TABLETS, phones — we use them every day, but for many, there comes a point where the urge to start writing your own apps is hard to resist. If you've never coded before, don't let that stop you. Python is one of the world's most popular programming languages, taught in schools and used in industry and academic research. One reason it's so popular is because it's one of the easiest languages to learn. You can learn Python at university, but we're going to show you in these four pages five key Python basics to get you started in coding your own programs.

THE FIVE PYTHON BASICS

Download the latest Python 3.6 programming language for your computer from **www.python. org/downloads**. Install it and launch 'IDLE', Python's code terminal or 'shell'. Here, you can type single commands and execute them. To write and save programs with many commands, choose 'File > New File' to launch a new code editor window.

PRINT

The first thing you do when learning a programming language is print 'hello world' — newbie coders have been doing this for nearly 50 years. The 'print' function writes to the screen whatever you tell it to, but it's also a little cleverer than that:

```
print("hello world")
```

Enter this line into the Python shell at the '>>>' prompt and it'll print 'hello world'. The brackets after the command or 'key' word 'print' is where you place the data or 'input' to this function. Just like a quote in a book, you place the string of characters you want printed inside quote marks.

```
print("hello", 23)
```

All programming languages handle character strings and numbers differently and, here, we print the word 'hello' and the number '23', separated by a comma to indicate they are separate entities.

```
print(10+12/6-2*5)
```

This is the clever bit — enter the above instruction into Python shell and it will calculate this problem and print the answer for you. Leaving out the quote marks tells Python this isn't text to print but a mathematical problem to solve.

VARIABLES

In programming, variables are storage buckets for holding a single entity of data — it can be a string of characters, for example, "hello world", or a number, such as 438. It can also be a mathematical expression, like '9 + 5' or '7 * 9 + 10' (here, the star * symbol or asterisk means 'multiply').

```
price = 9.95
quantity = 23
total_price = quantity * price
print("The total price is", total_price)
```

Open a new code editor window, type in the above code, save it as 'variable.py' and press key

code!

'F5'. If you've never coded before, congrats — you have now. The first line assigns the decimal value '9.95' to the variable 'price'. The second line assigns '23' to 'quantity'. Essentially, when it comes to variables, whatever is on the right-side of the equals sign (=) is assigned to the variable on the left-side. Any time Python sees a word or string of characters without quote marks, it treats it either as a command word or a variable. Python has rules for selecting variable names — to keep it simple, start them with a letter and don't use Python keywords, for example, you can't use 'print' as a variable because Python already uses that word.

The third codeline is simple, but profound — on the right side, we ask Python to multiply (*) the values in variables 'quantity' and 'price'. Python performs any calculations on the right-side first, then assigns the result to the variable on the left-side. So it multiplies 'quantity' by 'price' and stores the result in variable 'total_price'. Finally, the last line prints the result to the screen, first with a simple message, followed by the value inside the 'total_price' variable.

There are two other things to see here — first, Python executes your instructions one at a time and second, it starts at the top and works down (called 'top-down execution').

INPUT

If you want users to interact with your code, you need to get input from them and that's what the input() function does. It gives the user a text prompt and waits for the user to enter a response, halting further execution of your code until the user presses the Enter key.

```
price = input("Enter the price:")
quantity = input("Enter the quantity:")
total_price = float(quantity) * float(price)
print("The total price is", total_price)
```

Create a new code editor window, type in the above code, save it as 'input.py' and press F5. Rather than use fixed values as before, we'll allow the user to enter in their own values. The first codeline prompts the user to enter in the price of an item — the characters typed in are stored in the variable 'price'. The second codeline does likewise for quantity.

However, the input function only returns strings of characters, but you can't multiply strings together, only numbers. So to multiply the values entered in by the user, we need to use the float() function, which converts the character values in each variable into decimal or 'floating point' numbers — the third codeline does this, multiplying the number values and storing the result in variable

Our 'branch.py' code shows how to identify odd and even numbers.

The if-else statements allows you to branch to different code blocks.

The for-loop is ideal for printing out your times tables.

'total_price'. Finally, we have the same print() codeline as before.

BRANCHING

Computer programs are a top-down structure of instructions, but there'll be times when you want your code to switch or 'branch' depending on a variable value or input provided by a user. This is exactly what 'branching' is used for. Branching in Python takes the form of if-else statements.

```
number = input("Enter a number:")
if (int(number) % 2 == 0):
        print("Your number is even.")
else:
        print("Your number is odd.")
```

Create a new code editor window, type in the above code, save it as 'branch.py' and press F5. The first codeline asks the user for a number and stores the value in variable 'number'. The codelines following that are an if-else codeblock. We start with the 'if' keyword, followed by a funny-looking statement inside the brackets () and ending in a colon. The code inside the brackets is called a 'condition statement' — if the statement is true, the code immediately following the colon is executed, but if the statement is false, the code after the 'else:' keyword runs instead.

So what's going on inside those if-brackets? The first bit is 'int(number)' — this tells Python we want to turn the string of characters stored in the 'number' variable into a whole number or 'integer'. That's followed by '% 2'. The percentage sign is Python's code for modulo, the remainder

you get when you divide by a whole number, in this case, two. So for example, 7 modulo 2 gives 1, since 2 divides into 7 three times, with 1 left over. Next comes the double-equals '==' sign — this means 'is equal to'. A single equals sign '=' is used to assign a value to a variable, so the double-equals sign is used instead to refer to equality. Finally, the statement finishes with '0', so all together, we want to know if the integer value of variable 'number' when divided by two has a remainder equal to zero. This is a very common method for working out if a number is odd or even. If the remainder of a number divided by two is zero, the number is even and we print "your number is even". Otherwise (else), we print "your number is odd".

PYTHON CODE INDENTING

Note the indented codelines — because the if-else statement introduces the idea of separate blocks of code, Python uses the tab key to identify code to be executed as a separate group. You can execute multiple statements within each block, provided they start with this minimum indent.

LOOPS

Writing code for something to occur repeatedly can itself become repetitive — think Bart Simpson writing 100 times on the blackboard 'I will not instigate revolution'. That's where loops come in. A loop is a block of code you want executed, either a fixed number of times or while certain conditions are met. The first type is known as a 'for-loop'.

```
number = input("Enter a number:")
for count in range(13):
        print(int(number), "x", count, "=",
int(number)*count)
```

Create a new code editor window, type in the above code, save it as 'forloop.py' and press F5. The first codeline asks the user for a number as before. The following lines are the for-loop. We start with the 'for' keyword, followed by a variable name, in this case, 'count'. That's followed by another keyword, 'in', a 'range(13)' function and a colon ':'. The 'range(13)' part tells Python to create a sequence of whole numbers or 'integers', starting from zero, up to one less than the number shown in the brackets. In this case, range(13) gives a sequence of 0 to 12. The codeline in total says "for each number in range(13) that is stored in turn in the variable 'count', do this". The 'this' refers to code after the colon and indented on the next line, in this case, a print command.

Here's how the for-loop works — range(13) starts at zero, so the variable 'count' is given the

Use the input() function to get data from the user.

The print() function outputs not just text, but calculates as well.

The print() function can also output the value of variables.
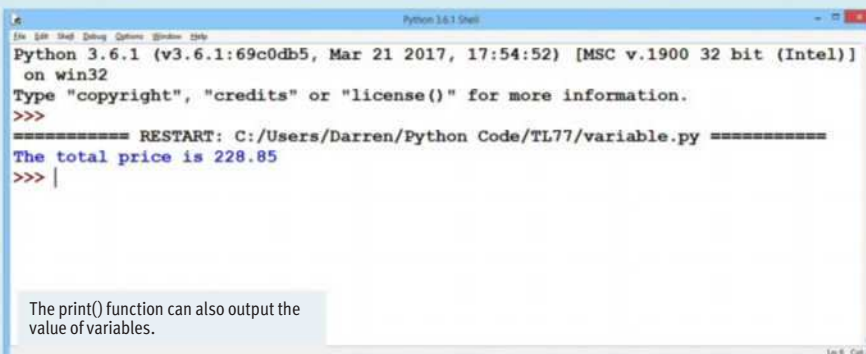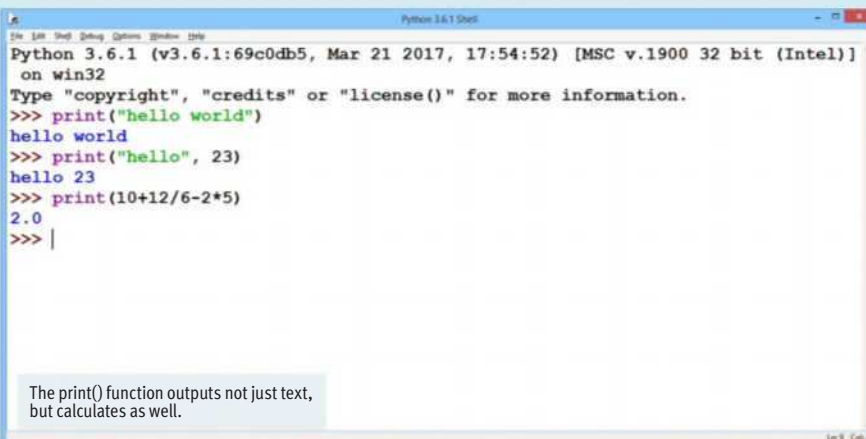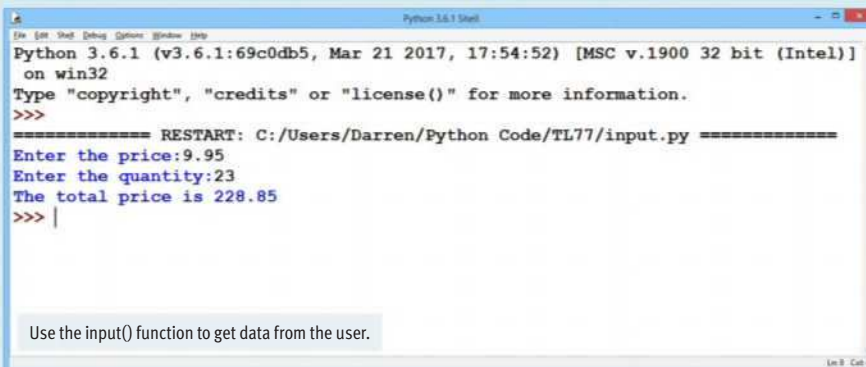
value '0'. The print statement forming the loop first prints the value of the variable 'number' entered by the user (let's say '6'). It then prints 'x', followed by the value of variable 'count', which is '0'. Next, it prints an equals sign and, finally, the value of the user number multiplied by the value of variable 'count'. Or in other words, '6 x 0 = 0'.

Once that print statement is complete, it goes back to the for-loop and selects the next value in the range(13) sequence, which is '1'. It runs through the print statement, printing '6 x 1 = 6'. Again, after this, it goes back to the for-loop statement for the next number in the sequence, which is '2' and prints '6 x 2 = 12' and so on until the final sequence number is reached, '12', and prints '6 x 12 = 72'. Once that's printed, the program stops because it's reached the end of the sequence. And yes, this program prints out times-tables.

The second loop type, the while-loop, works similarly but continues loop-execution while a condition remains true.

```
import random
number = random.randrange(10)
guess = -1
while (guess != number):
guess = int(input("Guess my number (0-9):"))
if (guess != number):
print("Nope! Try again…")
print("You got it!")
```

Create a new code editor window, type in the above code, save it as 'whileloop.py' and press F5. The first codeline imports the 'random' module into Python — modules are like plug-ins for Python adding extra functions, the random module generates random numbers. The next line generates a random integer between 0 and 9 and stores it in the variable 'number'. After that, we create a variable 'guess' and store minus-one in it. Next comes the while-loop. It starts with the 'while' keyword, followed by the condition inside the brackets, in this case, that the value of variable 'guess' is not equal to the value of variable 'number'. As long as this condition is true, meaning we haven't yet guessed the correct number, the loop continues. That loop codeblock starts with the indented code, initially asking the user for a number and storing the number value in variable 'guess'. The if-statement following checks if the value of 'guess' is not equal to the value of 'number' and if that condition is true, prints the message 'try again'. Note the double-indent here — this is known as nested-indenting and allows Python to follow the correct code path. Once that 'try again' message is printed, we go back to the while-loop line, check that the values of
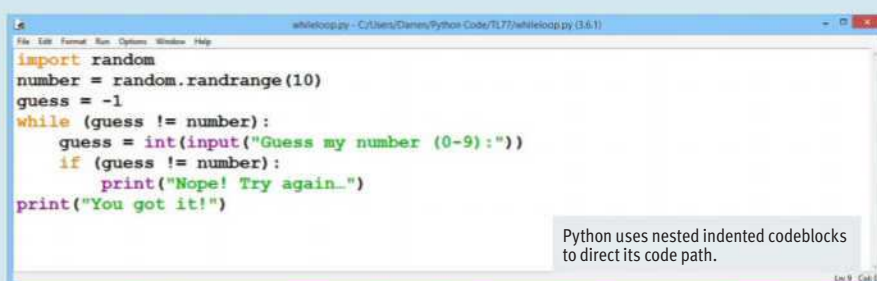
'guess' and 'number' are still not equal. If they weren't equal at the if-statement, they won't be here, so we ask the user again for a number. This time, let's assume the user gets the number right — when we get to the if-statement now, 'guess is not equal to number' is now false, so the 'try again' statement is not printed. We go back to the while-loop and again 'guess is not equal to number' is false, so we quit the while-loop and go to the next codeline on the same indent level as the while-loop codeline, which is the final print statement 'you got it'.

MORE TO LEARN, ENOUGH TO START

If you've got this far, congrats! There's still plenty more to learn, such as functions and classes, but you now have enough to start writing your own useful programs. The thing to remember is think in terms of 'input-process-output' — the input you want from the user, how you'll process it, and the output you'll deliver back to the user. Professional computing programming starts with these basics.

DON'T GIVE UP

Every coder makes mistakes and the whole thing can seem difficult at first, but it's like learning to drive, playing the piano or any other endeavour — be resilient, persist and you'll get the hang of it! Good luck. ∎

Get the Python programming language free from the python.org website.

Python uses nested indented codeblocks to direct its code path.

A while-loop is ideal when you don't know how many times to loop.

25 BEST APPS

THE 25 BEST APPS FOR WINDOWS 10. DOWNLOAD
THEM NOW AND GET MORE FROM YOUR PC TODAY!

[NICK PEERS]
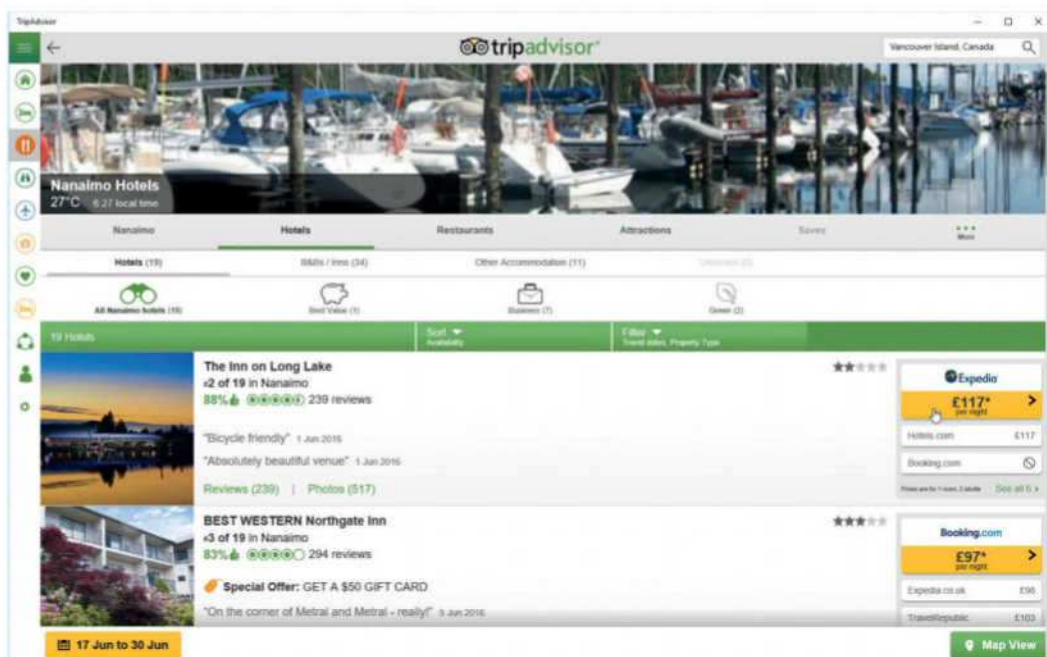
Plan your next trip

Whether you need help with travel, days out, hotels or things to do while on holiday, the TripAdvisor app (free, Microsoft Store) has you covered. Not only can you find what you're looking for, but you can book directly through the app, too, comparing prices to get the best possible deal. Look out for the areas of interest section, giving you ideas for your next break.

Faster, easier web browsing

All web browsers are pretty much the same, aren't they? Not really. Opera (www.opera.com) has made a striking bid for uniqueness with a sleek, simple interface and the ability to sync your settings between multiple devices. Also, recent updates have introduced native ad-blocking, VPN for secure browsing and power-saving for laptops and tablets.

LISTEN TO AUDIOBOOKS

One of the best ways to kill long, tedious journeys — particularly if you're driving — is with an audiobook, and the go-to place for getting digital audiobooks is Amazon's Audible. Install the Audible app (free, Microsoft Store) on your PC and you can buy, manage and — crucially, of course — listen to your purchases on your computer, too.

IMAGE-EDITING FOR EXPERTS

If you want a complete set of professional-level editing tools without the cost, then Paint.NET (free, www.getpaint.net) is the best there is. Support for multiple layers, powerful filters and the ability to extend its capabilities further with a series of community-written plugins make Paint.NET an essential tool in anyone's creative toolkit.
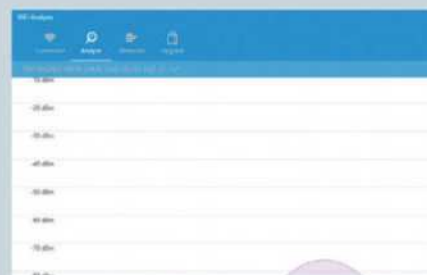
IMPROVE YOUR WI-FI SIGNAL

One of the biggest problems with wireless connections is the overlapping of networks, causing dropouts and performance issues. Wi-Fi Analyzer (free, Microsoft Store) provides you with a handy summary of your network, plus lets you compare it to other networks, suggesting the best channel to switch it to in order to minimise interference and boost performance.

Get useful system info

Want to find out more about the makeup of your PC? Need to keep an eye on the temperature of your computer while you're running intensive tasks? Install Speccy (free, **www.piriform.com**) and it'll reveal all kinds of useful detail, not just about the hardware in your system, but also Windows itself (including your product key).
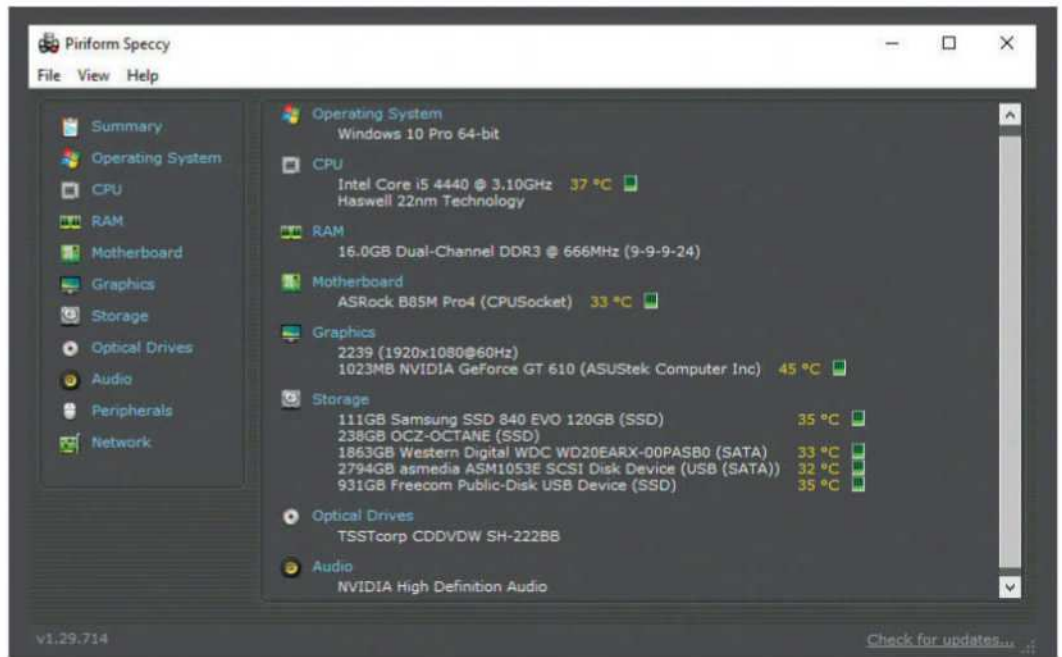
Learn new languages

Need to brush up on your linguistic skills, or want to learn a new language from scratch? DuoLingo (free, Microsoft Store) is the perfect, easy-to-follow tool that'll teach you up to 12 new European languages in a series of lessons divided into modules and tests. Visit **www.techradar. com/1314224** for a complete guide.
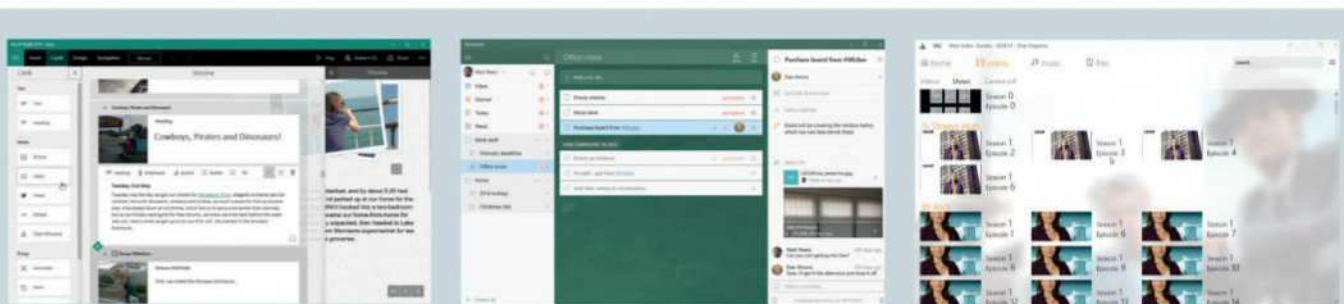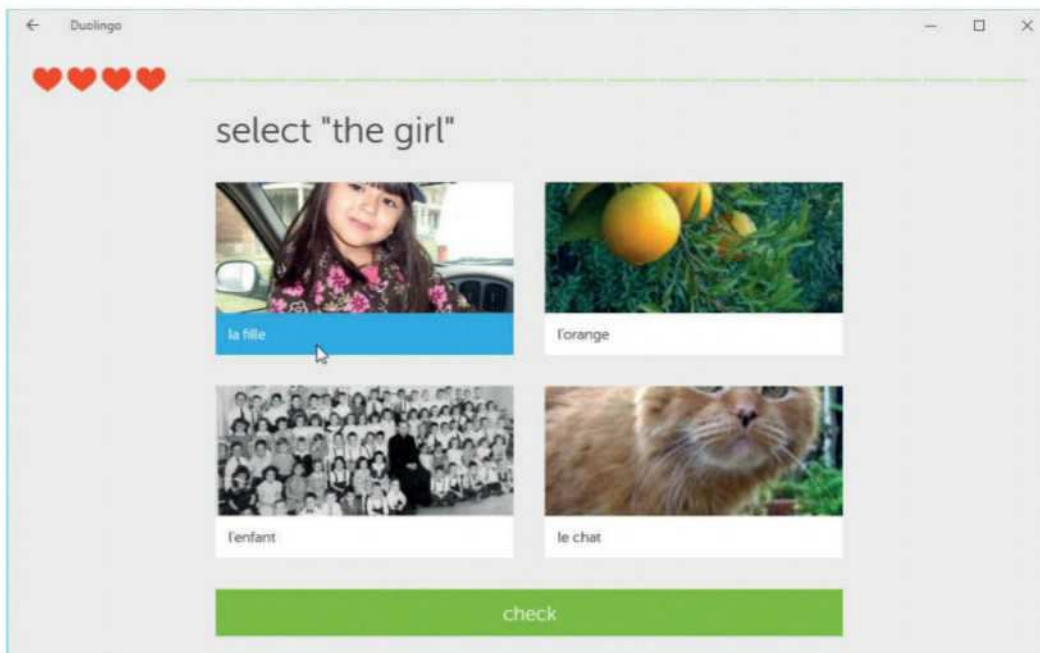
MAKE STUNNING PRESENTATIONS
Looking for an original way to showcase your last holiday, or share a family story? Perhaps you want to wow someone with a presentation. Microsoft Sway (free, Microsoft Store) enables you to blend together text, photos, videos and other elements — such as embedded maps — in an eye-catching presentation you can share online. It does all the hard work of laying them out, too.

PROJECT-MANAGE WITH EASE
Wunderlist (free, Microsoft Store) is a powerful cross-platform tool that makes it easy to plan and manage everything from small tasks to huge projects in one place. Everything's organised into folders, lists and to-do items, all of which can be assigned to individuals, with deadlines, notes, attachments and more. You'll never have to remember anything again.

PLAY ANY VIDEO
Want to be able to play just about any video file without having to find a suitable player? Install VLC for Windows (free, Microsoft Store) and you can add your music and video libraries and play pretty much any format you come across. Need to play DVD videos too? Install the desktop version from **www.videolan.org/vlc** instead.
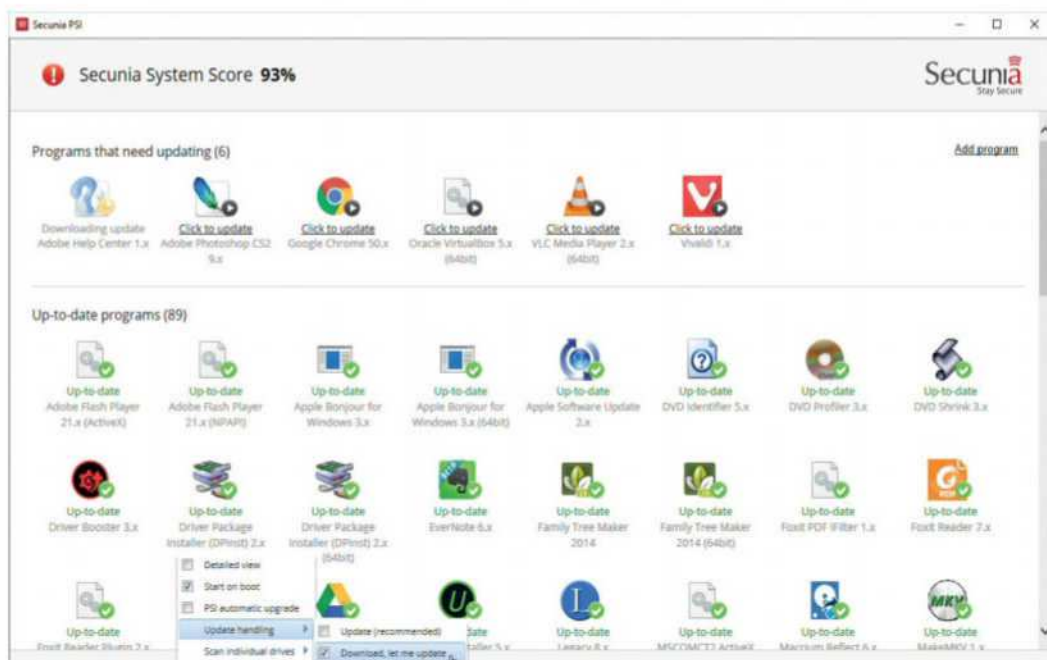
Keep apps up to date

Free software updates don't just fix bugs and plug security holes, they often add new features too. Make sure you're not missing out by installing Personal Software Inspector (free, **bit.ly/softinspector**). It can silently keep apps updated in the background, or you can configure it to alert you when updates become available so you stay in full control of the process.

Remove programs thoroughly

Once you've installed a few of these great apps, you may discover one or two you don't really use. Make sure they're completely removed — along with other unwanted apps — with the help of IObit Uninstaller (free, **www.iobit.com/en/ advanceduninstaller.php**). Its powerful scan removes leftover files and Registry entries — just make sure you untick the option to install the full Advanced SystemCare suite during installation.
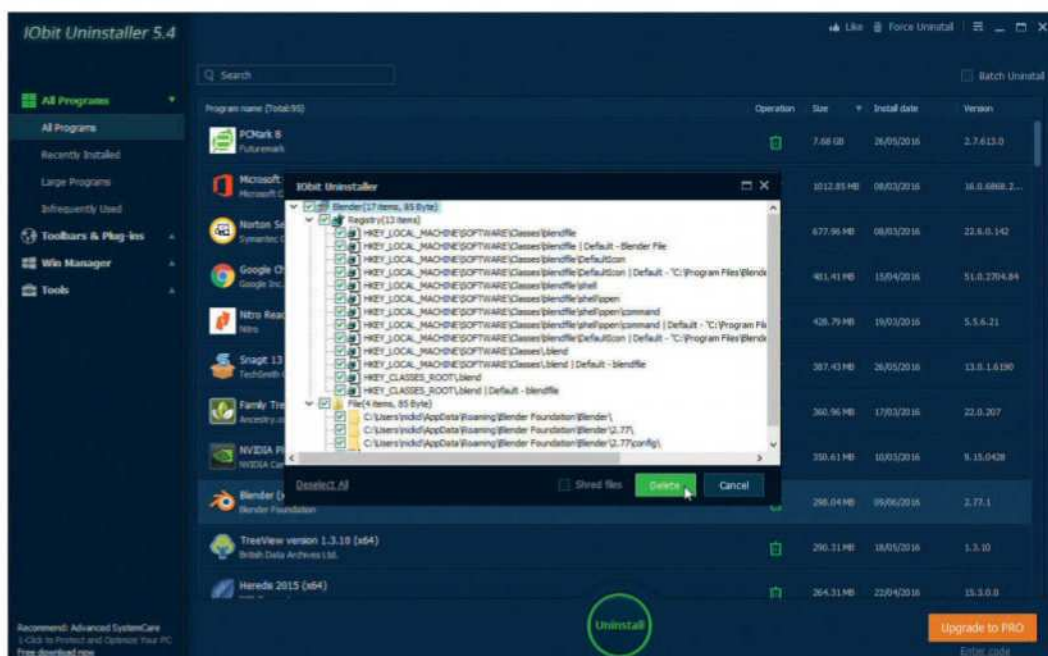
OFFICE FOR ALL THE FAMILY

Free office suites are all well and good, but Microsoft Office 365 Home ($129/yr, **www.office.com**) is exceptional value considering it covers five PCs and Macs in your home, plus gives you 1TB storage on OneDrive. You get the latest versions of Office, plus you can install powerful mobile versions on up to five tablets and five phones, too.

RECORD AND EDIT AUDIO

Want to record narration or edit an existing audio file? The best tool for the job is Audacity (free, **www.audacityteam.org**). You can record through a mic, capture streaming audio or — with the right cables — capture sound from an external source such as a cassette player or turntable. Then use Audacity's powerful tools to trim, edit and fix noise-related issues like hiss.

MANAGE YOUR PASSWORDS SECURELY

If you use LastPass Premium (US$24/year, **www.lastpass.com**) to keep your online passwords safe and easy to access, but don't want to have to open your browser to get at them, install the LastPass app (free, Microsoft Store). This enables you to view your passwords, secure notes and form fillers — copy and paste them into another app window, plus edit them, too.

Manage your email

Looking for a versatile email client that works with just about any email account? Thunderbird (free, **www.getthunderbird.com**) offers all the core functionality you need, plus some handy extras like linking large email attachments (via third-party plug-ins) to your cloud storage, making them easy to share with others without clogging up inboxes.
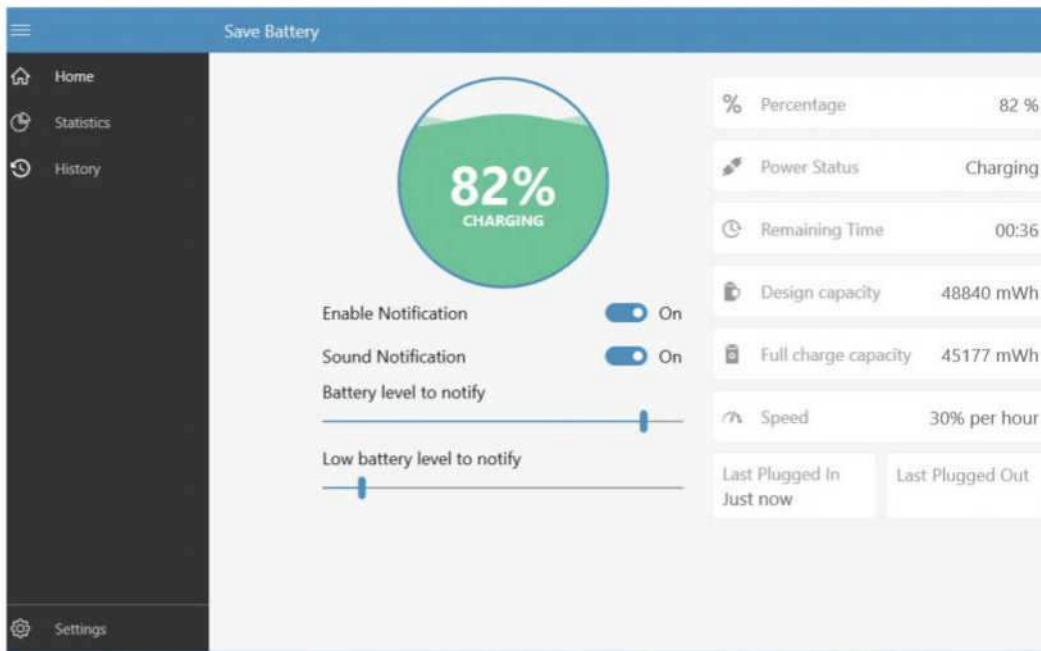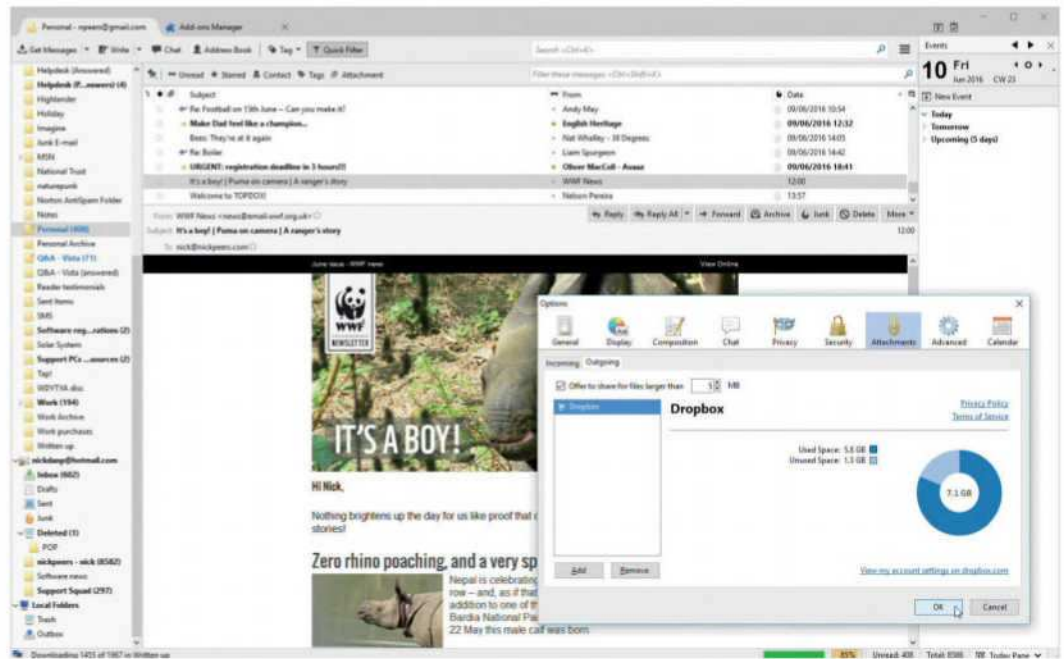
Detailed battery stats

The Battery taskbar notification area icon provides basic detail about your laptop's battery. Install Save Battery (free, Microsoft Store) and you can access lots more useful detail, such as when it was last plugged in, its discharge rate and overall health. You can set battery alerts, too, but the history feature requires upgrading to the Pro version.

RIP AND CONVERT VIDEO

Sometimes, you need video files in a specific format so they'll work with your phone or another device. MP4 is the most common format around, and Handbrake (free, **www.handbrake.fr**) can convert video from most formats into MP4 — it can even be used to quickly optimise video for playback on specific devices, too.
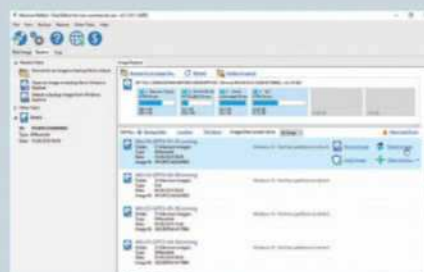
TAKE A FAILSAFE BACKUP

What happens if you're forced to reinstall Windows? Even if your data is backed up or stored on a different drive, the time taken reinstalling all your programs and settings after the event can take hours. Take a full system image using Macrium Reflect Free (free, **www.macrium.com/ reflectfree.asp**) and you need never worry about losing programs, settings or data again.
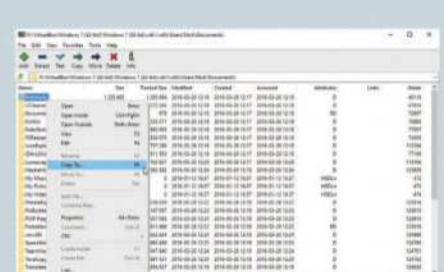
OPEN ANY COMPRESSED FILE

Windows 10 ships with built-in support for ZIP files, but what happens if you come across a different kind of compressed file — such as .rar or .7z? Don't worry, 7-Zip (free, **www.7-zip.org**) will enable you to not only access these file archives, it can also peek inside virtual drives and create archives in common formats, too.
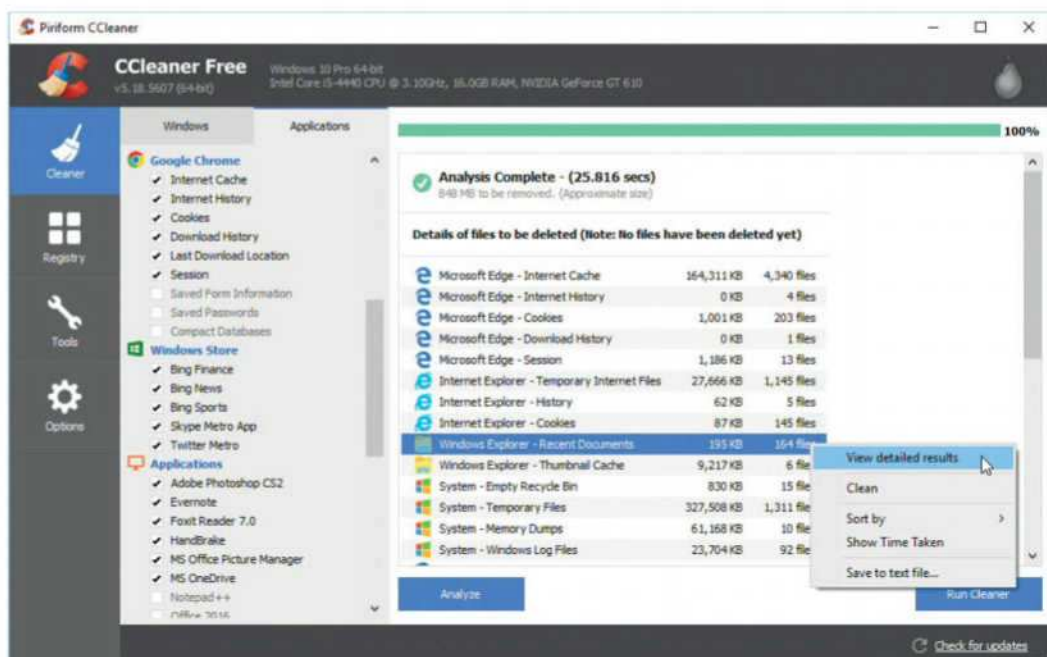
Clean out your PC

We often need reminding to keep storage drives free from clutter, so it keeps your PC running as efficiently as possible. Trimming startup programs and cleaning out various parts of your computer will help achieve maximum speed. CCleaner (free, **www.piriform.com**) will help you stay on top of system maintenance and prevent slowdown.

Embrace portable applications

We love portable apps — these are special versions of programs that contain themselves to a single folder on your PC, with no Registry entries or files cluttering up other directories, enabling them to be run on other PCs from a USB drive. Use the PortableApps Platform (free, **www.portableapps. com**) to find and manage these via a Start menu-like interface.
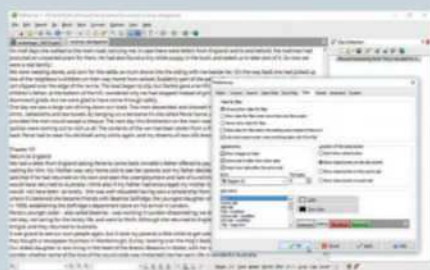
EDIT TEXT WITH STYLE

Notepad is fine for basic text-editing, but if you're looking to step up, then EditPad Lite (free for personal use, **www.editpadlite.com**) is an essential upgrade. Open multiple files in tabs and switch between them, enjoy unlimited undo and automatic backups as you type, plus store multiple text snippets for easy access via the Clip Collection.

VIEW AND CREATE PDFS

PDFs ensure that documents you share look the same on whichever computer or platform they're viewed on. These days, all good free PDF reader tools can create PDFs from other sources, too, and our current favourite is Foxit Reader (free, **www.foxitsoftware.com**), which also has the benefit of being light on system resources and it's extremely fast, too.

SUPER-POWERED NOTE-TAKING

Simplenote is great for quick notes, but if you want a fully featured digital notebook with support for annotations, photos, lists and even freehand sketches, then Microsoft OneNote (free, Microsoft Store) is a better bet. You can even transfer content from other apps, services and websites via a variety of third-party tools (including Microsoft Edge).

HELP STATION
GET THE MOST FROM YOUR TECH

JetDrive Lite comes in capacities up to 256GB; ensure you buy the right version to fit your MacBook.

on iCloud — you get 5GB for nothing, and if you want more, you'll incur a monthly charge; you can have up to 2TB of iCloud storage at this time — see *support.apple.com/en-au/HT201238*.

For movies and TV shows bought from the iTunes Store, it's simplest to stop storing them locally. You'll only want to watch one or two movies in the next day or so; leave those on your Mac, and remove all other movies and TV shows — you can redownload them later on.

In iTunes, select a film that's stored locally, then choose 'Film > Remove Download'. To watch it, you'll need to download it again, but it remains available and costs nothing extra to redownload (unless your internet service provider charges for heavy bandwidth usage). Do this for TV shows and other large content, such as iOS apps downloaded through iTunes.

You could move your iTunes Library to an external drive, but it'll only be available when that's connected. Consider adding a special SD card that fits entirely in the SDXC slot. Be wary of using apps that claim to 'clean up' storage, though a tool like DaisyDisk can help identify what you might move to such SD storage.

[MAC]
What's the best way to free up storage on my Mac

My 2011 MacBook Pro, with a 320GB drive, is running out of space. Much of its storage is being taken up by music and movies. Can I move them to an external drive, or put them in the cloud?
[EUGENE HARRELSON]

Howard Oakley replies: Apple provides storage as part of iCloud, but to free up a lot of space on your Mac, you'll have to rent more

[WINDOWS SECURITY]
Ransomwares and network shares

I back up a fail-safe copy to my networked hard drive, but I have learned it may not be immune to a ransomware attack. What can I do to protect it?
[ALICE THOMAS]

Nick Peers replies: The best way to prevent ransomware from infecting any network shares
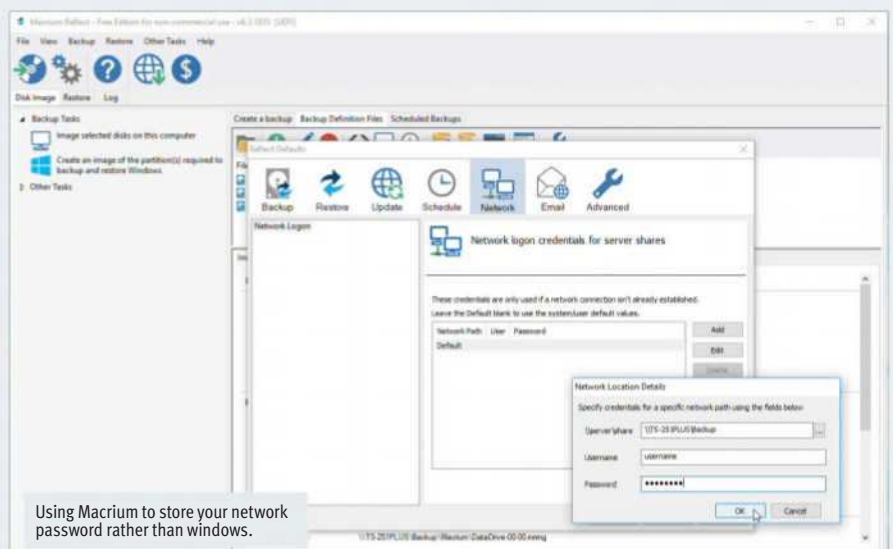
Using Macrium to store your network password rather than windows.

Gigabyte's LAN Optimizer is a good utility for regulating network connections
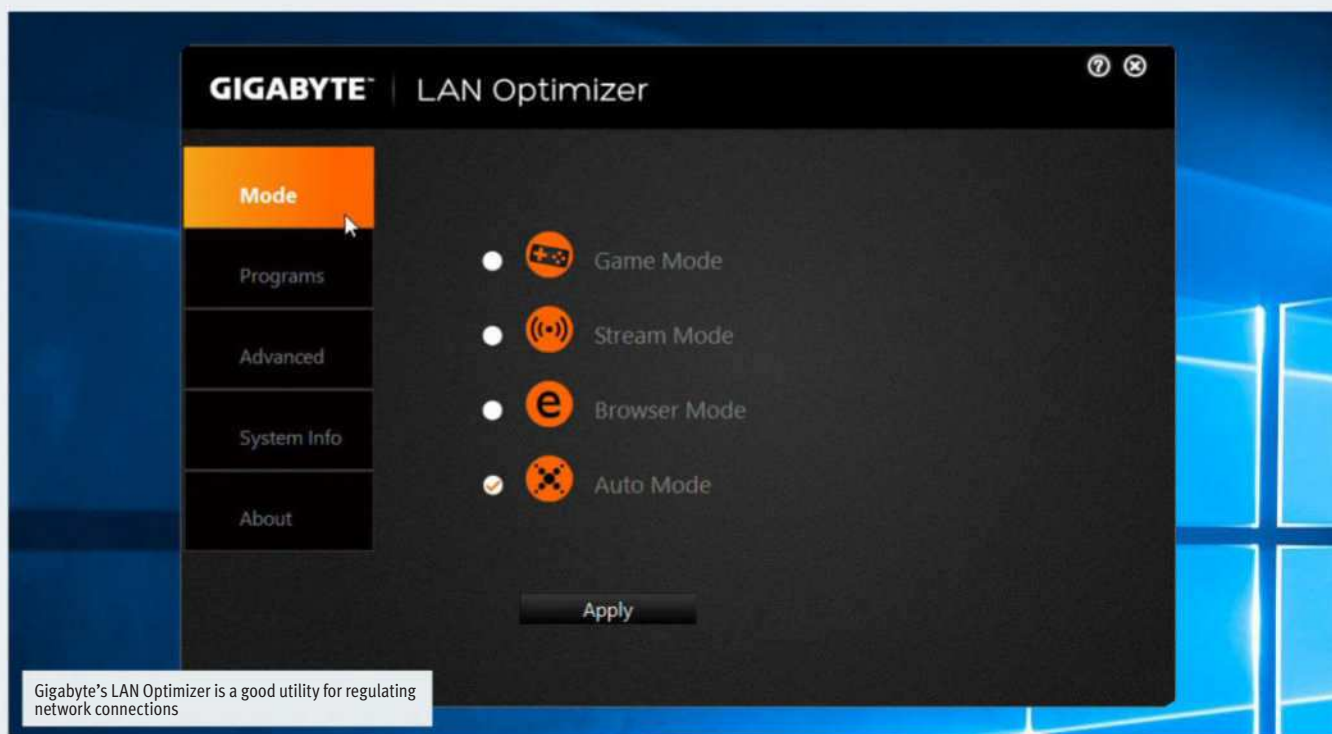
is to make sure that your network credentials aren't stored in Windows. This is a two-step process — first, make sure your Windows user account doesn't have access to the network share in question (in other words, create a dedicated username and password for accessing that share — easier to do when logging on to a NAS drive). And second, when you log on to a network share, resist the temptation to tick the box marked 'Remember my credentials' — you'll have to manually enter a username and password each time you log on, but it reduces the share's exposure to potential infection. If you currently have saved network credentials in Windows, you can remove them: type "credentials" into the Search box and then click 'Manage Windows credentials' to access the built-in Credential Manager tool. You should see entries for each saved network password under 'Windows Credentials' — next, click the 'v' button followed by 'Remove > Yes'. This should clear it. If you're backing up to a network share, check to see if your backup tool can save those network credentials independently of Windows — for example, in Macrium Reflect, select 'Other Tasks > Edit Defaults > Network' tab. Click 'Add' to manually add a network path, username and password and then click OK twice. You can now back up without exposing your network share to ransomware.

Ofcom's free Wi-Fi Checker app may not detect dropouts, but is a useful initial test for most Wi-Fi network problems.

[INTERNET]
Random internet connection problems

I have a problem whereby my internet connection appears to stop working or otherwise slows down — there's no pattern as to when it occurs and it's particularly noticeable when downloading images in emails or from the internet. Can you help me resolve this issue please?
[CONNOR HATTON]

*Ian Sleightholm replies: We answered a similar question a couple of years ago. We asked Connor what motherboard he had installed — a Gigabyte. You can see which motherboard is installed in your computer using the free Speccy system information tool if you don't already know — get it from **www.piriform.com**. We then checked whether Connor had installed Gigabyte's LAN Optimizer (**www.gigabyte.com/ MicroSite/300/lan-optimizer.html**), which is used to regulate network connections. Disabling this immediately improved matters. The program has a reputation for disrupting internet connections and not performing as it should, so Connor was happy to remove the program and finally fix the problem.*

[IOS]
Why does AirPlay Mirroring drop out?

My iPhone 7 Plus keeps dropping out when trying to use AirPlay Mirroring. I have the NBN, have updated to the latest versions of iOS and tvOS, turned off background app refresh, and tried resetting the Apple TV and iPhone. How can I stop these annoying dropouts?
[CHRISTOPHER HOUGHTON]

*Howard Oakley replies: First determine whether this only affects incoming content from the internet, or all content streamed to your Apple TV. If it doesn't affect locally-stored content, then it's probably an issue with your internet connection, which may prove hard to fix. Being on the NBN, you should have ample bandwidth, but there may be technical reasons for periodic dropouts that only your ISP can remedy. If this is a local problem, work through Apple's setup for your wireless router, detailed at **support.apple.com/en-au/ht202068**. Because some routers can encounter issues between local wired and wireless connections, it can sometimes help to use a wireless connection between your Apple TV and your router; other routers may work better on a wired Ethernet connection. Wireless interference is another possible cause. Ofcom's Wi-Fi Checker app (free, **tinyurl.com/tla77-ofcom**) can also be helpful. Sometimes separating out your Wi-Fi connections can be beneficial. Name your 2.4 and 5GHz networks differently; put your Apple TV and iPhone on the latter, and other devices on the former. Even then, you may need to wait for a software update for a complete fix.* ∎

[MAC]

Make more of your workspace

DISCOVER DESKTOP TRICKS YOU MIGHT HAVE MISSED

[ADAM BANKS]

THE DESKTOP IS the backdrop to all that happens on your Mac's screen. A key feature is the menu bar, which remains visible except when you're using apps in full-screen mode, and the Dock, which can either stay visible or hide and show itself. You can save or drag files and folders to the desktop for fast access, and screenshots (when you hold 'Cmd-Shift' and press 3 or 4) are saved there by default. In 'Finder > Preferences', you can choose to show disks, devices and servers as desktop icons but, to save clutter, that's no longer the default. Here, we look more closely at the desktop's most important features.

MISSION CONTROL
FIND THE WINDOW YOU WANT.

At any time, press F3, or Ctrl and the up arrow key, or swipe up with three fingers on your trackpad, to open Mission Control. This shows all your active workspaces at the top — even if you haven't specifically created extra spaces with the + on the right, each app running full-screen has one — and all windows in the current space below. Click a window/space up top to switch to it, or Opt-click a space to see its contents in Mission Control.

[STEP BY STEP]

HOW TO CUSTOMISE THE DOCK
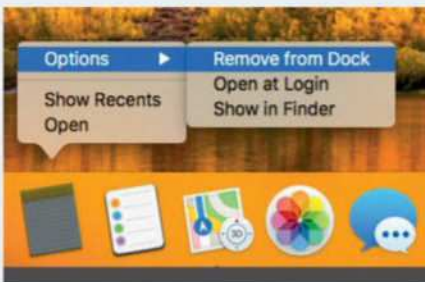
01 ADD/REMOVE AN ITEM
To remove an app from the Dock, drag it out and let go. Or Ctrl-click it, go to Options, and select Remove From Dock (or uncheck Keep in Dock); it stays 'til you quit it. If you've opened an app and want to keep it around, hit 'Keep in Dock'.

02 HIDE/SHOW THE DOCK
In 'System Preferences > Dock', check 'Automatically hide and show' and the Dock appears only when the pointer hits the bottom of the screen. Otherwise, it always shows. You can change this at any time by pressing 'Cmd-Opt-D'.

03 USE STACKS
The Dock's right-hand area can hold shortcuts to folders or files — drag one here from Finder. The Downloads folder is here by default; click it to see its contents in a fan. Ctrl-click to switch to a grid or list, or to change sorting order.

KEY FEATURES OF THE DESKTOP
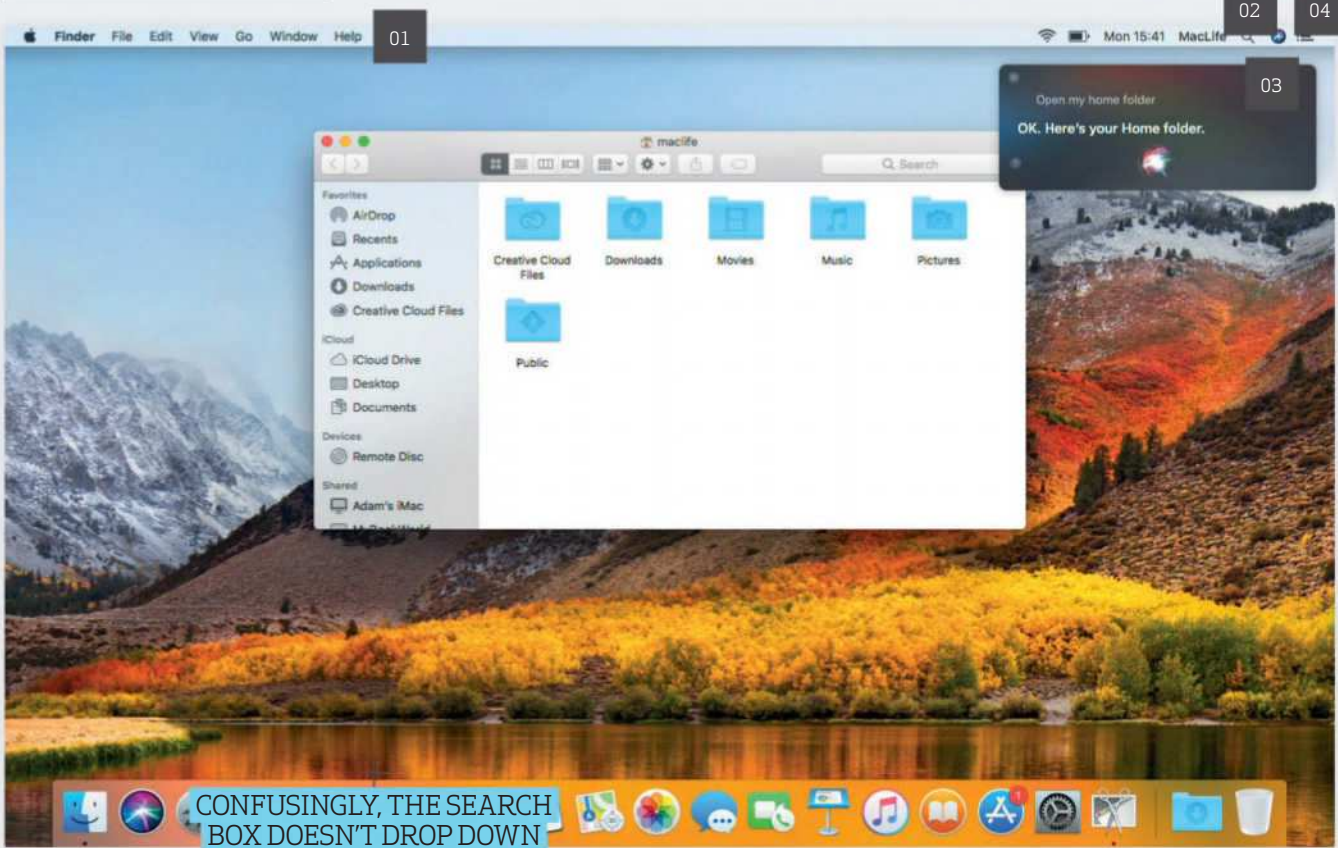
CONFUSINGLY, THE SEARCH BOX DOESN'T DROP DOWN FROM THIS ICON, BUT APPEARS WHERE YOU LAST POSITIONED IT ON THE SCREEN; TO RESET THAT POSITION, CLICK AND HOLD ON THIS MENU BAR ICON.

01 THE MENU BAR

This shows commands for the currently active app (Finder, if you aren't using a specific app). The first item is always the Apple menu, where you can access system info, System Preferences and the Mac App Store, shut down and restart. In Sierra and High Sierra, you can optionally hide the menu bar until the pointer is at the screen's top edge, via 'System Preferences › General'.

02 SPOTLIGHT

Click the magnifying glass icon in the menu bar, or press Cmd-Space, to search your Mac, iCloud Drive and online. Confusingly, the search box doesn't drop down from this icon, but appears where you last positioned it on the screen; to reset that position, click and hold on this menu bar icon.

03 SIRI ICON

Click this to use Siri, or hold Opt-Space until Siri appears. This shortcut can be changed in 'System Preferences › Siri'.

04 NOTIFICATIONS

Click the rightmost icon for Notification Centre. The Today tab shows reminders, appointments, weather and more; drag items to rearrange them or click Edit to alter what's shown. The Notifications tab shows latest alerts; click the cogwheel (bottom right) to change preferences.

05 DOCK

To add an app to the Dock, drag its icon in from a Finder window. To remove one, drag it out; the app itself is not deleted. To open or switch to an app, click its icon. Open apps have a black dot below (or white, if your Dock colour is inverted).

GESTURAL SHORTCUTS
CLICK, DOUBLE-CLICK OR TOUCH

You open files or folders on the desktop by double-clicking. But items in the Dock open with a single click, or you can Ctrl-click (or tap two fingers on a trackpad, or click and hold) to open a menu of options. If your trackpad has Force Touch, pressing on an app icon has the same effect as selecting Show All Windows — like Mission Control, but for that app alone. Or place the pointer over the icon and double-tap two fingers on your trackpad or Magic Mouse. ■

[SECURITY AND PRIVACY]

Hack yo'self

SCAN YOUR OWN SYSTEMS FOR THE KINDS OF VULNERABILITIES THAT HACKERS WOULD EXPLOIT.

[NATHAN TAYLOR]

ONE OF THE best ways to protect the devices in your home is to run the same kind of vulnerability scans on them that hackers will. This month, we'll look at a few ways you can scan your devices to see if anything is vulnerable to remote hackers.

PORT SCANNING YOUR PC

One of the most common ways that hackers can find a way into your PC is by running a port scan.

The term 'port' in this context refers to an internet (TCP/IP or UDP) port. When an application on your PC or device sends data over the internet it attaches a certain port number to the traffic, which tells the receiving device what kind of traffic it is and which application it's associated with. For example,

HTTP (web) traffic is usually sent on port 80, so when your computer receives the data on port 80, it knows that data belongs to the web browser and sends the data on to the right app.

Normally, your firewall will block all incoming ports. No traffic can come to your PC unless you 'dialled out' — ie, initiated the connection from your PC. A web server, for example, cannot send data to your PC unless you request it by opening a connection. Think of it like making a phone call — you can dial out but nobody can dial in. That is, unless your own PC is running a

service. Services are apps that allow other people to connect to your PC. For example, if you're running a web server yourself, or you're running a windows file server. Then that app might talk to your firewall and tell it to leave a port 'open' so that other devices can talk your PC. The firewall will actually let traffic on this port through.

Now, these open ports can potentially make you vulnerable. If you're running a Windows File Share on an open port, for example, then anybody from outside your network might be able to access it. You'd better hope that your passwords are good.

So we come to the port scan. What hackers will often do is run a port scan on your system. It's an automated script that checks a whole host of ports to see if you have any services running. If you do, then they can try to break into that particular service.

To prevent this, you can port scan your own system to see what the hackers would see if they scanned you. Experienced security professionals would use an app like Nmap (**nmap.org**), a command line tool for running a security scan.

For beginners, however, we actually recommend Shields Up! From Gibson Research (**www.grc.com**), a site that has been around forever but still does the job. It's a web-based port scanner, and all you need to do is visit the site and click on the 'All Service Ports' scan button.

What will happen next is that Shields Up! will run a remote scan of your network, trying out the first 1,056 ports. Ideally, it will report green (which means the port is stealthed/closed) for all scanned.

If any port is not green, then you might have a problem. If it's blue, then the port isn't open and you're not in danger, but your firewall isn't doing its job properly. A good firewall should be a black hole, preventing all outgoing communications — but a blue port means that your computer has actually responded to the scan.

> WHAT HACKERS WILL OFTEN DO IS RUN A PORT SCAN ON YOUR SYSTEM. IT'S AN AUTOMATED SCRIPT THAT CHECKS A WHOLE HOST OF PORTS TO SEE IF YOU HAVE ANY SERVICES RUNNING.
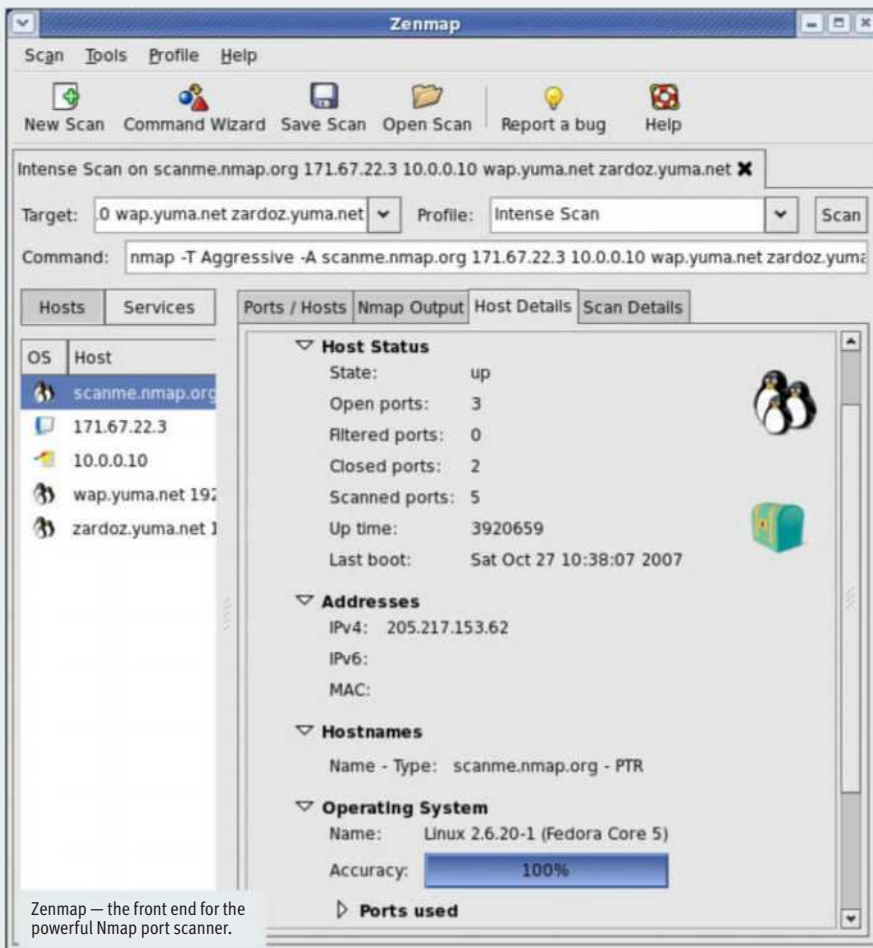
Zenmap — the front end for the powerful Nmap port scanner.

Green is good.
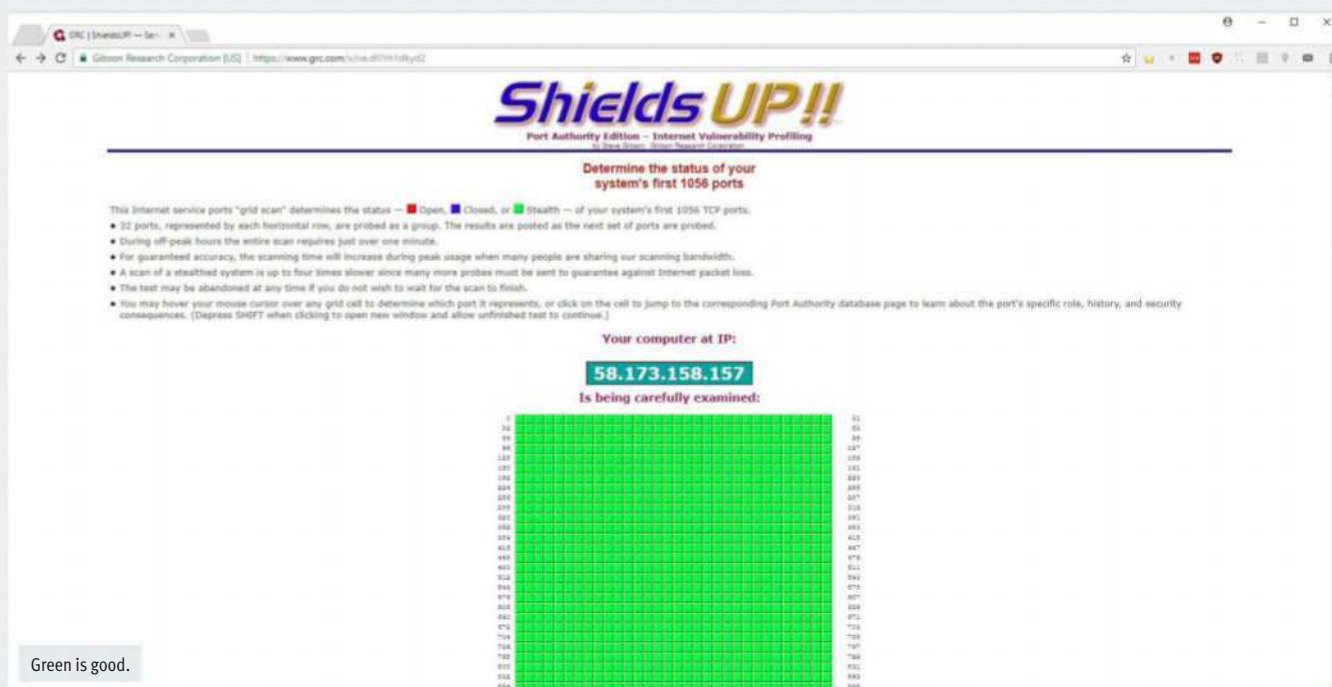
Red means that there's a port open and a service running. You're potentially vulnerable. In order to see what application it is, click on the red square and Shields Up! will tell you what service normally runs on that port. You should then do your best to shut that service down (you may have to Google how to do that).

USING BITDEFENDER HOME SCANNER

There's a variety of home scanners on the market, and frankly, they don't hold a candle to professional tools like Metasploit (**www.metasploit.com**), Wireshark (**www.wireshark.org**), Nipper (**www.titania.co.uk**) and Nexpose (**www.rapid7.com**). However, those tools are extremely complicated and are not easy for non-technical folks to grasp.

If you want something simple to give you a broad overview of your home network; however, we recommend Bitdefender Home Scanner. It's a free, consumer-friendly tool that will give you an overview of vulnerabilities on your home network. It will run a port scan on all your internal devices, and will even check 'smart' devices like routers, networked TVs, IP cameras, media players and other devices for vulnerabilities. It will check for default passwords as well as common vulnerabilities.

You can get the app from **www.bitdefender.com/solutions/home-scanner.html**. Download and install it. You'll need to create a Bitdefender account to run it, and you'll need to run it while connected to your home network. Then just follow these steps:

01 You'll first be asked if this is your home network. Assuming the network connection is the one you use to connect to your home network, click Yes.

02 The scan will run. It will first identify all the devices on your home network, then it will scan them. This might take a while,

01 You'll first be asked if this is your home network.
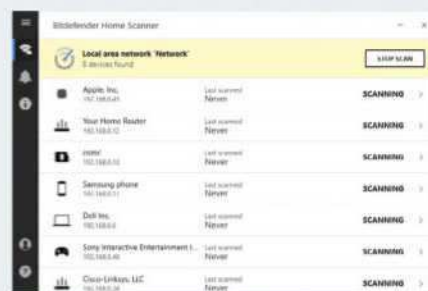
02 Let it do its thing. A report will be created once complete.
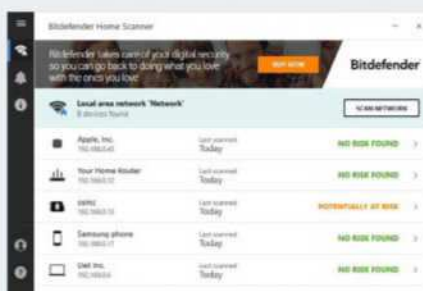
03 Devices at risk will be flagged.
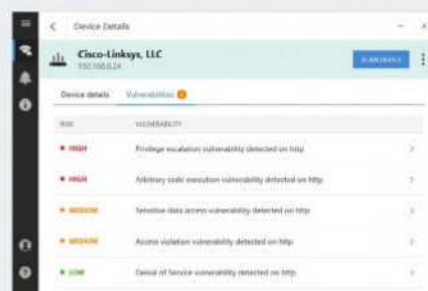
04 The vulnerabilities summary page.

depending on how many devices you have.

03 For each device you'll get a report — either 'No risk found' or 'Potentially at risk'. Click on the device to see the details.

04 For devices with 'Potentially at risk', there will be a summary page detailing the potential risks.

Now comes the hard part: remediation. If a device is listed as at risk, then it's a good idea to investigate what you can do about it.

One of the most common problems is that you haven't changed the default password on the device, or that you haven't given it a password at all. So the first thing you should do is go to the device in question and change the

password (and make sure it has a password). The second thing you should do is check if there's a firmware or other update for the device. Make sure that the software it's running is up to date.

After you've done those things, come back to Bitdefender Home Scanner and scan the device again. Is it still potentially at risk? If so, then it's time to do some Googling or contacting the manufacturer. Try to find how others have shut down the vulnerabilities, and see how much damage can really be done via the vulnerability. Making sure that every device in your house is safe is the only way to be sure that your network is hacker-proof. ∎

[DOWNLOADS AND STREAMING]

The best streaming apps for your mobile and tablet

HOW TO GET SOME 'ME' TIME WITH YOUR VIDEO COLLECTION.

[NATHAN TAYLOR]

SO YOU'VE DOWNLOADED a nice little collection of videos on your home PC or home server. Now you'd like the ability to go hide in your bedroom, backyard or basement and watch them on your tablet or phone, without having to fight for time on the big screen. To do that, you'll need an app that's capable of streaming the video from your PC or NAS to your mobile, and this month, we have your guide to the best such apps. (For more on mobile storage devices, check out our feature on page 72.)

THE BEST MOBILE STREAMING APPS
KODI

Kodi.tv
Available on: Android and iOS (with effort)
Once known as XBMC, Kodi is the god among media players, the one most people go to first when it comes to streaming from their home servers. It plays just about anything, supports multiple streaming protocols including DLNA and Windows File Sharing, can stream directly from a variety of internet sources like Twitch and YouTube and can be updated with some pretty amazing add-ons that can even stream directly from file sharing services and online hard drives.

It does take a little bit of setting up, though it's not complicated. In Kodi, you have to add

'sources'. You can designate your home server as a source, or the local storage on your mobile, or an SD-Card, a file share or UPnP/DLNA and so on. And then you navigate to that source to browse it, and it will show all the content on that source.

It's mostly for streaming locally. Technically, it can also stream over the internet, but that takes some more serious setting up involving port forwarding and secure shares, and we probably wouldn't recommend it if you're not an expert (Plex or Emby are better for that).

INFUSE

firecore.com/infuse
Available on: iOS
If you're on iOS and couldn't be bothered using trickery to get Kodi working, Infuse is a very solid replacement. It doesn't have all the features of Kodi, but it's arguably more intuitive to use and the latest version (5) has some really excellent additions, like native parental controls, subtitle imports, downloading movie and TV episode information from TheMovieDB and TVDB, as well as trakt support for keeping track of what episodes you've watched.

Like Kodi, you start with Infuse by adding media sources. You can add DLNA media shares, Windows File Sharing directories,

NSTALLING KODI ON IOS
While Kodi is available on Google Play, Apple has refused it permission to go on the iTunes App Store, which normally means that you'd need a jailbroken iOS device to run it (and there is a version of Kodi for jailbroken iOS).

But there is an easier solution: Tweakbox, which lets you install some apps (such as Kodi) not normally allowed on iOS, even on devices that haven't been jailbroken. Both Tweakbox and the version of Kodi it downloads are ad-supported.

To use Tweakbox, open Safari on your iOS device and go to **www.tweakboxapp.com**, then tap on the install app button. You'll have to go through a few confirmation steps to install the profile on your device.

After you've done that, you should see the Tweakbox app on your home screen. Launch the app, close any ads that pop up, then tap on the Apps tab.

Tap on the Tweakbox Apps button, then in the search bar, type "Kodi". You should see a result for Kodi. Tap on it, then tap on Install, and Kodi should be downloaded to your iOS device.

Use Tweakbox to install Kodi on iOS

Kodi plays pretty much anything

Infuse lets you add a variety of local and network sources.

VLC will automatically detect servers on your local network.

Emby apes Plex in many ways, and choosing one over the other usually comes down to a few personal preferences.
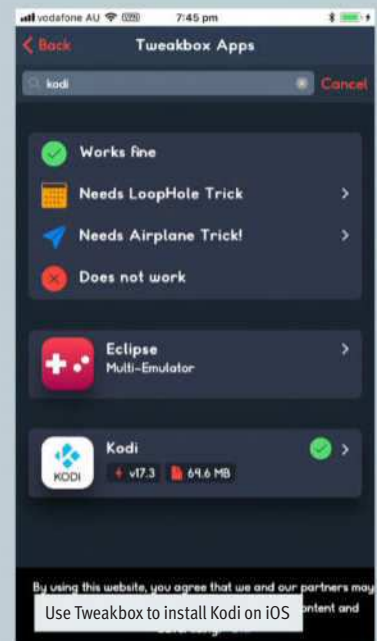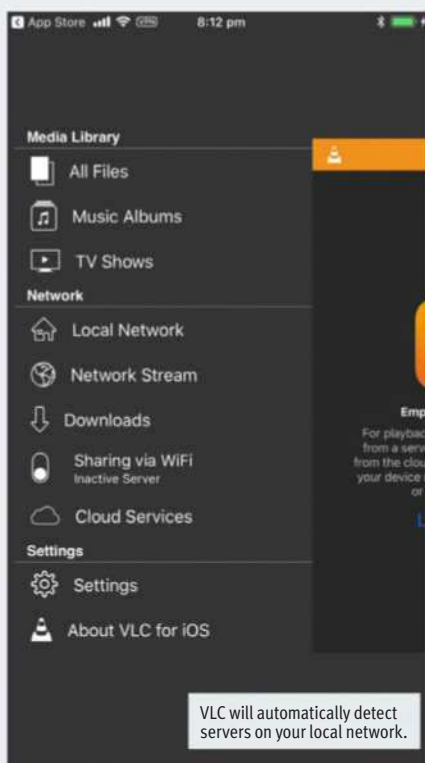
cloud services and local storage. You can use iTunes to transfer videos to your iOS devices and it will also work with Lightning storage devices. During setup, it will automatically scan your network for existing DLNA and Windows File Shares, making it very easy to add sources.

VLC FOR ANDROID/IOS

www.videolan.org/vlc/
Available on: Android and iOS
VLC, the famous media player for PC, made its way to mobiles a few years back, and it's fair to say it got off to a shaky start with unstable and limited apps. It has come a long way since then, so if you just want something simple that will play nearly any file you throw at it, it might be your answer. Unlike Kodi and Infuse, you don't create sources per se — you just browse the network live. You can sync files to VLC using iTunes on your PC, but you can also stream directly from File Shares and DLNA servers. Just tap on the cone icon in the top left, select Local Network, and you'll see a list of detected DLNA and file sharing servers. Then just select the server and navigate to the

desired video. It could use some bookmarking systems, but the playback is smooth and fast.

PLEX

www.plex.tv
Available on: Android and iOS
Although it will cost you US$5 to unlock the functionality of the mobile client (unless you have a Plex Pass subscription, in which case the mobile unlock is part of the sub), Plex has gained massive popularity as a closed, easy-to-use system that lets you stream your media from anywhere.

Plex comes as a client and a server. The first thing you do is install the server on the device where your media is stored. Then you install the clients on all the devices that you want to play the media on, including your mobiles. As part of the setup, you create a Plex login, which automatically connects your clients with your servers (so you don't have to worry about searching for them on the network).

The servers store more information than your typical media server. They also store episode information, trailers, a log of what

you've watched, parental control settings, and can sync with cloud services. What's more, you don't have to be on the same network as your media — you can stream over the internet, bandwidth permitting (just make sure that you don't get nuclear excess charges by streaming over 4G!) The mobile client also supports Chromecast to beam up to a big TV set.

EMBY

emby.media
Available on: Android and iOS
We covered Emby fairly extensively in our March issue (page 96), so we won't retread it too much here, except to say that it operates in a very similar fashion to Plex, with both a server app and a client app that work together to create a system more capable than most systems using stock DLNA or Windows File Sharing. That includes details like extended movie and TV episode information, music lyrics, live TV and parental controls.

Like Plex, it's also a commercial product, requiring that you purchase a subscription or pay a small fee to unlock the mobile client. ∎

Plex is a complete system, with both a client and server app.

THE BEST STREAMING SERVERS

Here we've talked all about our favourite clients, but what about the software for serving the media across the network? If you have a NAS, it probably has a DLNA server built in and can should use that. But if you want to share media stored on a PC we can recommend Plex (www.plex.tv) or Emby (emby.media) server.

Although the Plex and Emby clients cost money, their server apps are free, and they will in fact work with any client through DLNA. So you can still use Kodi, for example, to watch movies stored on a Plex or Emby server. You won't get all the extended features of Plex or Emby, since those are proprietary extensions built into the client, but you can still watch anything you want.

Kill ads on your mobile

HOW TO GET RID OF THOSE BANDWIDTH-SUCKING ADS IN YOUR BROWSER AND MOBILE APPS.

[NATHAN TAYLOR]

ALTHOUGH WE'VE REACHED the point where most of us have more than enough monthly broadband data to satisfy our needs at home, download quotas on mobiles still tend to be a squeeze. Most of us run afoul of our data limits sooner or later, and that means either paying ridiculous excess charges or being forced to fork over extra for data packs.

Ads are big part of that. A sizeable chunk of the data we download is likely to be ads that we didn't ask for, but our mobile decided to download anyway. These are ads embedded in websites, as well as in mobile apps and games.

So this month, we thought we'd look at a few ways to stop those ads — first, in your web browser, and then for all your mobile applications as well.

BLOCKING ADS IN YOUR BROWSER

It's actually very easy to block ads in your browser now. Most of the major mobile browsers — Firefox for Android, Safari,

Opera — have easy options for ad-blocking. The very notable exception is Chrome, which still lacks add-ons on mobile. If you want to block ads in Chrome, you have to look for a global ad-blocking solution, which we'll touch on in the next section on blocking ads in apps.

Opera is the easiest of all. It has an ad-blocker built in. In the settings, you'll find a Block Ads option. Just enable it and you're good to go.

On Firefox on Android, all you need is to download an ad-blocker add-on. We like uBlock Origin, but AdBlock Plus is also a popular choice. Tap on the menu button on the top right and find the tools menu item. Then select the Add-ons option, which will open a page to search for Add-ons. Then just do a search for uBlock Origin and install it.

In Safari on iOS, what you'll need to do is install and enable an ad-blocker from the App Store. Popular options include Crystal, 1Blocker, Purify, AdBlock and

AdGuard. We presently like AdGuard, mostly because it's completely free and we've found it works really well, but you can grab and install the app of your choice.

You're not quite done, however. You still need to enable it for Safari. Go to your iOS's device settings and find the Safari settings. Then, under General settings, find the Content Blockers menu item and tap on it. You'll see a list of all the content blockers you have installed. Then tap on the switch to enable them for Safari.

With the ad-blocker enabled, your web browsing experience should now be mostly free of ads. But there's more that we can do. We can also set up what is, in effect, a global ad-blocking solution that will even work for many of the ads delivered in apps.

AD BLOCKING IN APPS

If you commute to work and play games to pass the time, then there's a pretty good chance that a large chunk your monthly quota gets sucked up by obnoxious video
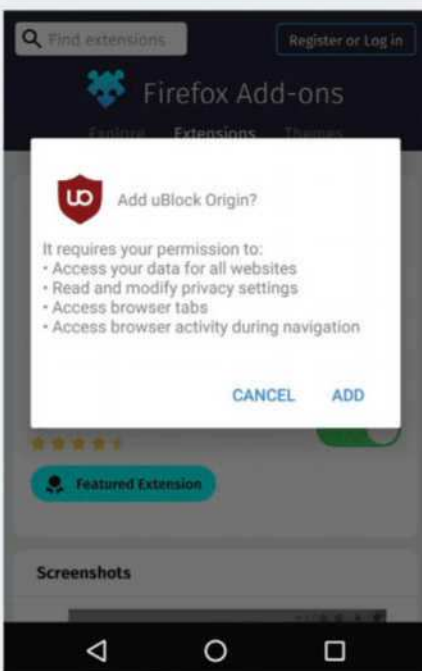
On Firefox on Android, you can install an ad-blocking Add-on like uBlock Origin.

Find the Safari settings.
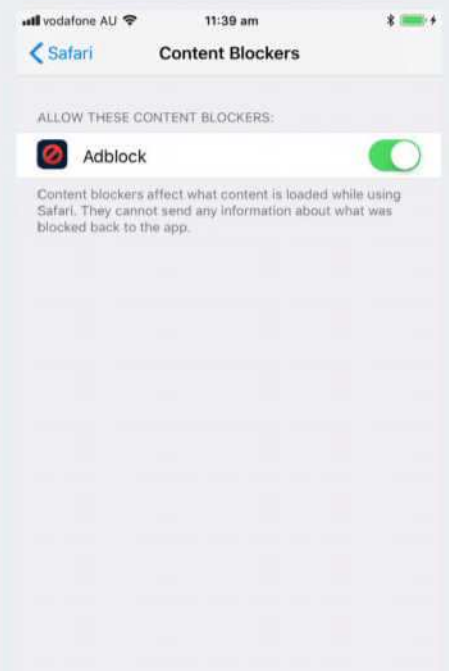
Enable the Content Blocker for Safari.

ads that play in between levels of free games you've installed. Every time one of those animated ads loads, you can virtually feel your monthly quota being sucked dry. Thankfully, it is possible to kill those ads — but it can be a bit trickier than removing browser-based ads.

In general, ad blocking for mobile apps is accomplished using domain name service (DNS) trickery. DNS, if you recall, is the system that converts URLs like **techlife.net** into IP addresses that computers can understand. You can stop your mobile from even talking to ad services by modifying your DNS settings so that the domains of known ad servers are invisible to your mobile device. If your phone or tablet can't find the ad service, it can't download ads.

For example, if you're using a mobile app with embedded ads, that app might try to reach out to admob.com to download your next set of ads. But instead of telling your mobile the real address of the ad server, the DNS system would instead point to an empty page. Thus it can't find the ad to download.

When you're on Wi-Fi, it's actually quite easy to take the mobile ads out. You just go to your Wi-Fi settings, change the DNS settings to manual, and then enter this IP address as your new DNS server: 176.103.130.130.

That's the IP address of the AdGuard DNS server (**adguard.com**), a special DNS service that returns null results for most common ad services, including most services that provide in-app ads for mobile applications. It genuinely works — most of the mobile apps that we tested with in-app advertising worked just fine, but the ads were eliminated.

But the thing is, it's not when we're on Wi-Fi that we really want to remove the ads. It's when we're connected to 3G/4G that we want to remove the bandwidth-suckers. And here's the problem: unless you have a rooted/jailbroken phone, you can't do that for cellular data. Neither Android nor iOS let you manually set a DNS server for mobile internet connections — you have to use the DNS supplied by your mobile carrier.
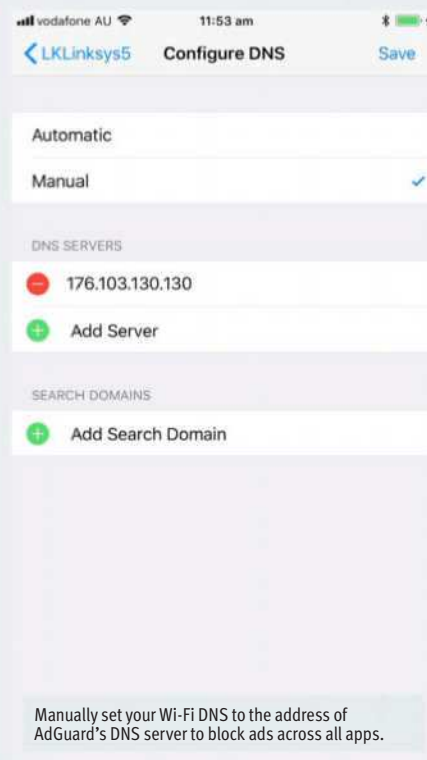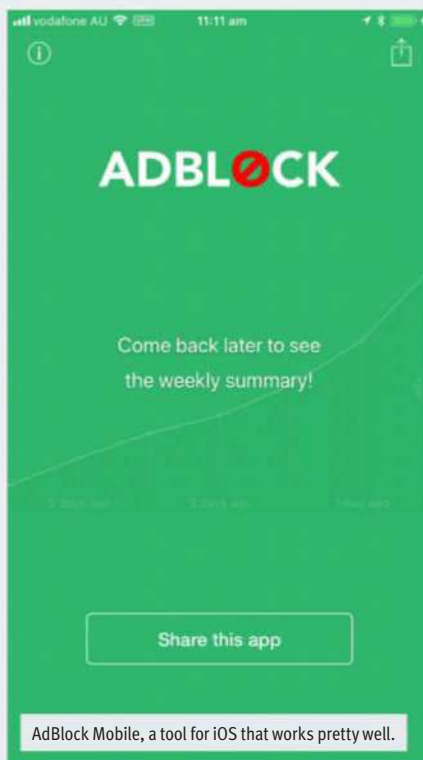
AdBlock Mobile, a tool for iOS that works pretty well.

Manually set your Wi-Fi DNS to the address of AdGuard's DNS server to block ads across all apps.

Nor can you modify the hosts file on these platforms without rooting/jailbreaking. The hosts file is a custom list of DNS resolutions for your PC. Modifying the hosts file is a common way of filtering ad services, and it's what products like AdAway (**adaway.org**) do.

But there are solutions. On both iOS and Android, there are apps that use the VPN feature of your phone to designate an alternate DNS to the default. In the iTunes App Store, you can try DNS Override, although to designate a custom DNS, you'll have to pay a few dollars for the app.

On Google Play, you can find a similar app called DNS Changer, which also requires the payment of a few dollars so that you can enter a custom DNS. In both of those apps, you could enter a custom DNS server to create a DNS-based ad filter (you could use the AdGuard server at 176.103.130.130).

On Android, however, we actually prefer Block This! (**block-this.com**), a one-stop shop for mobile-wide ad-blocking.

> **IF YOU'RE USING A MOBILE APP WITH EMBEDDED ADS, THAT APP MIGHT TRY TO REACH OUT TO ADMOB.COM TO DOWNLOAD YOUR NEXT SET OF ADS. BUT INSTEAD OF TELLING YOUR MOBILE THE REAL ADDRESS OF THE AD SERVER, THE DNS SYSTEM WOULD INSTEAD POINT TO AN EMPTY PAGE. THUS IT CAN'T FIND THE AD TO DOWNLOAD.**

Block This! has been removed from the Play Store (because Google is the world's largest ad service, and it doesn't like apps that block them), but you can download it directly from the Block This! website by turning on the 'unknown sources' setting in Android. Block This! uses the VPN service of Android to trick the operating system into using a custom DNS server, one that blocks ads. You can also use AdGuard's own mobile app for Android, which functions similarly but uses the AdGuard DNS servers.

On iOS, there are similar apps as well. Our current pick is AdBlock Mobile, available in the App Store. It doesn't seem to have a 100% success rate when we use it, but it works often enough to be useful.

The other option for both Android and iOS is to use a real VPN service that blocks ads. A number of VPN services offer this feature now: PureVPN, NordVPN, Opera VPN, Private Internet Access, HotSpot Shield, CyberGhost to name a few. Most you'll have to pay for, however, and you should make sure that ad blocking is actually supported in the mobile app before purchasing.

Whether you go for a DNS solution or a full VPN, however, once you block those mobile app ads you'll be surprised at how much further your monthly quota will go. ∎

COLOR LOOKUP

SPLIT-TONE WITH CURVES

BEFORE

GRADIENT PRESETS

CUSTOMISE A GRADIENT

[DIGITAL DARKROOM]

Add more colour with tinting techniques

DISCOVER A QUARTET OF POWERFUL METHODS TO SPLIT-TONE YOUR PHOTOS BEAUTIFULLY IN PHOTOSHOP, CAMERA RAW OR LIGHTROOM.

[JAMES PATERSON]

SPLIT-TONE IN CAMERA RAW
A SIMPLE TECHNIQUE THAT WORKS IN LIGHTROOM TOO!

If you want to split-tone your images in Camera Raw (or Lightroom, which has similar tools), the Split-Tone panel offers a simple yet powerful set of controls. Open your image in Camera Raw (if it's a JPEG, right-click in Bridge and select 'Open In Camera Raw'), then go to the Split Tone panel. Use the Hue sliders to choose a colour, and Saturation to set the colour intensity. (A useful shortcut: Hold Alt while dragging Hue to temporarily view Saturation at 100%.) You can tint both shadows and highlights, or either one. The Balance slider shifts the bias between the two.
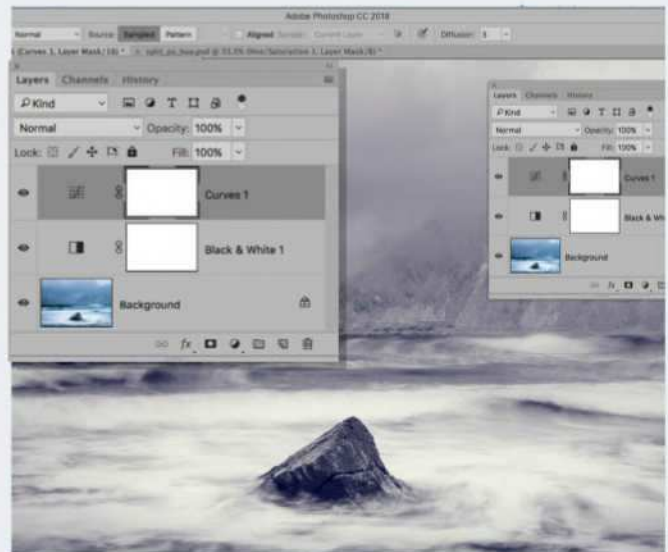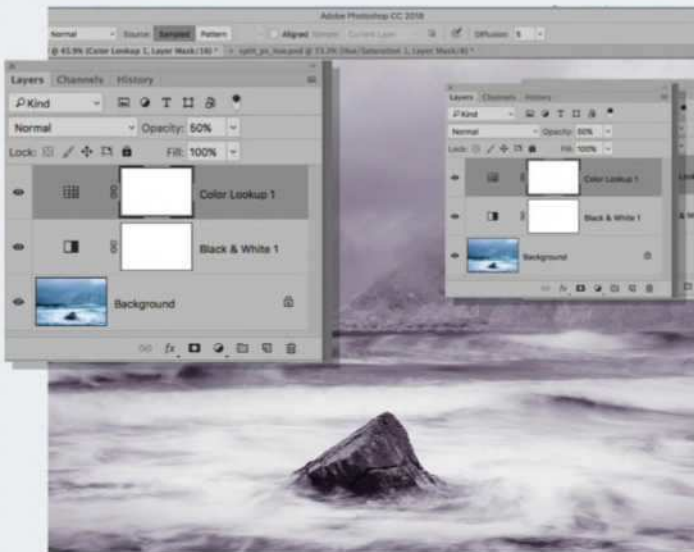
01 USE COLOR LOOKUP

Photoshop's Color Lookup adjustment lets you apply a range of easy presets, including several split-tone treatments. Open your image into Photoshop then go to the Layers panel, click the 'Create Adjustment Layer' icon and choose 'Black & White'. Click the same icon again and choose 'Color Lookup'. Click Abstract, then choose from split-toning effects like Cobalt-Carmine (used here), Green-Red or Sienna-Blue. If you like, use the layer's Opacity setting to control the strength of the effect.

02 SPLIT-TONE WITH CURVES

The Curves command is a fantastic tool for split-toning. First convert your photo to black and white (as in Tip 1), then add a Curves Adjustment Layer. Use the RGB dropdown to target the Red, Green or Blue channel. Start by tweaking the very top or bottom points on the diagonal line to introduce colour shifts to the highlights and shadows. On the Blue curve here, dragging the bottom point up adds blue to the shadows, while dragging the top point down adds yellow to the highlights.
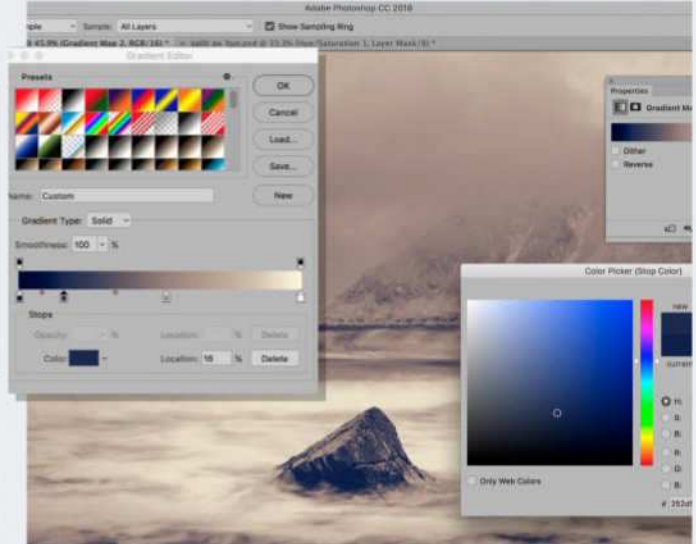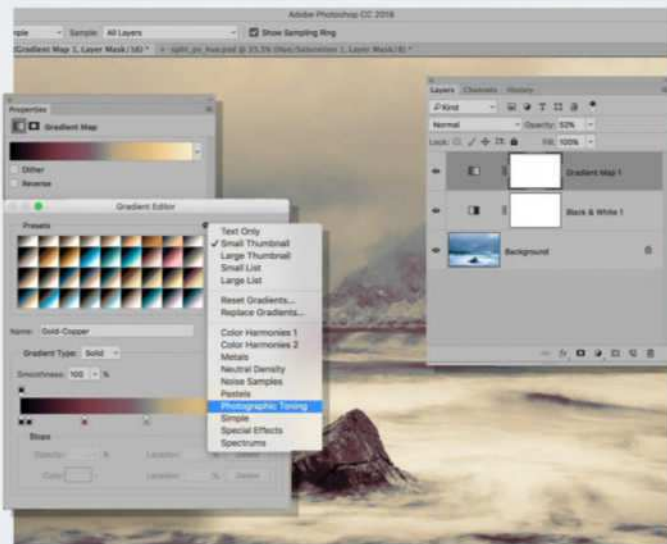
03 LOAD GRADIENT PRESETS

Photoshop's Gradient Map adjustment offers an array of presets that mimic traditional processes like Cyanotype, Selenium and Sepia. Click the 'Create Adjustment Layer' icon in the Layers panel and choose 'Gradient Map'. Click the preview to open the Gradient Editor, then click the cog icon in the top-left and load in the Photographic Toning set. Click Append, and the new presets will appear at the bottom of the list. Click through the presets — here, we've used Gold-Copper at 50% opacity.

04 CUSTOMISE A GRADIENT

As well as using Photographic Toning gradients, you can also use a Gradient Map Adjustment Layer to customise your own toning presets. As in Tip 3, add a Gradient Map Adjustment Layer and click the preview to open the Gradient Editor. Double-click the little boxes below the colour strip to choose colours to map onto different parts of the tonal range (shadows on the left, highlights on the right). Here, we've mapped blue to the shadows, red to the midtones and yellow to the highlights. ∎

© Vladimir Kochkin

[PHOTOGRAPHY]

Get more from your DSLR: Part 2

YOUR CAMERA IS LADEN WITH HIDDEN FEATURES — THIS IS HOW TO FIND THEM.

[CHRIS RUTTER]

THINKING ABOUT UPGRADING your camera? Are you doing it to take better photographs and with a clear purpose in mind? Those were the questions we posed in last month's *TechLife* (page 104) as we showed off the hidden depths in your current DSLR.

You will be surprised to see that your current DSLR has an array of features that will cast aside its limits — perceived or otherwise. Last month, we demonstrated how to set up intervals, taking effective and creative multiple exposures, truly getting to grips with the LCD

screen and more. All of these functions and hardware features have been present from the day you bought your camera; with some expert guidance, they will elevate your results — and save you some cash.

As we've previously mentioned, new camera models build upon the specifications of their predecessors, and these new features can be lost in the extensive menus that come with it. It's worth considering how efficiently you are using your camera, and whether you'd achieve the results you want with the options currently

at your fingertips when eyeing off that new piece of kit. Over the next four pages, we'll show you how to get the most out of your lowly internal flash, customise the button layout to make it feel fresh (and give you access to its powerful features), and show you how to better track fast-moving objects.

With these new ways of thinking in your photography tool belt, you'll hopefully find a new creative freedom, and really utilise the power of your current equipment.

MAKE THE MOST OF INTERNAL FLASH
WHILE NOT THE FIRST CHOICE FOR PHOTOGRAPHERS REQUIRING ADVANCED LIGHTING EFFECTS, BUILT-IN FLASH CAN BE A VALUABLE AND VERSATILE ASSET.

Built-in flash has somewhat of a bad reputation amongst serious photographers, who often do not feel it is flexible enough for regular professional use. It is true that external flashguns provide lighting that is easier to work with and that internal units have their limitations. The light from these flashes is known for being harsher, due mainly to their small size, which results in a limited spread of light. The softness of flash light is directly related to the size of the source, resulting in built-in flash producing a harder light 'hotspot'. Furthermore, the majority of integral units cannot be angled in any way, instead directing the light straight at the subject. Therefore, unlike with speedlights,

which can be angled to bounce flash off a wall or ceiling, it is easy to create an unflattering bleached look to skin, with patchy blown highlights. In addition, it is difficult to produce genuinely directional lighting, for which off-camera flash can be used to enhance texture or structure in the subject. There is also the matter of limited control — speedlights usually provide full customisation of the flash power and output, to easily blend flash light with the ambient light in the scene. Since this is not possible with integral units, it can be difficult to avoid flash falloff.

However, these weaknesses aside, there are benefits to be found with your DSLR's internal flash.

Firstly, internal flashes are always present and are powered by the main camera battery, meaning it is impossible to leave for a shoot without a flash or for the batteries to run out of power. Beyond this, professional speedlights are large and heavy, so there are weight-saving advantages when travelling. It is possible to adjust flash output to some degree and there are options for diffusing light from your flash; however, the greatest method of expanding its usefulness is to use it as a wireless trigger for same-brand external devices. Either way, it is advantageous to know how to make the flash on your camera truly useful.

Let's look at this in greater depth…

USE FLASH EXPOSURE COMPENSATION

TAKE CONTROL OF THE BRIGHTNESS OF YOUR FLASH FOR A SEAMLESS BLEND WITH AMBIENT LIGHT.

While it may not be possible to adjust flash output manually in the same way as on dedicated flash units, you can 'turn down' the presence of flash in your shots using flash exposure compensation. If the flash light overpowers natural or ambient light, use negative compensation to reduce the flash effect, relative to overall exposure. This reduces the harsh lighting associated with internal flash and makes its use for 'fill flash' far more practical.

Top right
OVERPOWERING
At its default setting the internal flash used here is too bright and, as such, has introduced flash falloff and produced an unsightly dark background

Right
A BETTER BALANCE
By using a setting of -3EV flash exposure compensation, the overall exposure remains the same, but flash output has been adjusted. The light now blends smoothly with the environment.

CONTROL EXTERNAL UNITS
EXTEND YOUR FLASH SHOT FLEXIBILITY BY TRIGGERING SPEEDLIGHTS, WITHOUT INVESTING IN EXPENSIVE THIRD-PARTY TRANSMITTERS.

01 LOCATE FLASH CONTROL MENU
Activate your built-in flash and then navigate to the dedicated flash settings menu on your camera LCD. At this stage, place your external flash on a light stand, or attach a flash stand to the base of the flash, then place it on a flat surface.

02 SET FLASH COMMAND MODE
To get your internal flash to 'speak' to the flash units, you'll have to activate the command mode. From the flash control menu, set wireless command to On. You may have the option to keep fill flash functionality from the internal unit.

03 SET SPEEDLIGHT AS SLAVE
On the external flash unit, use the LCD to scroll through modes and choose Slave Mode. The on-camera flash will now act as a master, triggering the speedlight when the shutter is fired. Ensure good line of sight between the camera and flash.

04 CHOOSE A CHANNEL
Assign a channel to your flash and ensure this corresponds with the currently selected channel on your camera. This will ensure your flash will be triggered correctly and your work won't be disrupted by other photographers working nearby, when shooting an event, for instance.

05 SELECT A FLASH GROUP
If you are using more than one flash and would like to control them all separately, assign them to groups. This provides the flexibility to have flashes fire independently and to have different power settings for each (such as when shooting with front, rim and hair lights, for example).

06 CONTROL FLASH OUTPUT
When using dedicated flashes — those made by the same manufacturer as your camera — it is almost always possible to control flash output wirelessly, directly from your camera. Select a group and adjust power to vary light produced by each of your external devices.

CUSTOMISE YOUR CAMERA BODY
**NOT ALL FEATURES ARE SET UP PERFECTLY BY DEFAULT —
REVISE HANDLING FOR INTUITIVE CAMERA OPERATION.**

When you buy a camera, it is set up using default factory settings, since the manufacturer is making the product for a full range of photographers with differing needs. While this is useful for general-purpose shooting, it is not conducive to creative images or operation outside of normal photographic situations.

Luckily, this can be corrected with relative ease, through the customisation of control layouts and functionality. However, more difficult to address is the generalised design of most DSLRs, which is also influenced by the expected handling by the 'average' user.

The proportions of a camera body make shooting in landscape orientation as comfortable as possible, working on the assumption that most photos will be taken in that way (since the imaging sensor is fixed in this position). When shooting at an unusual angle or in portrait format, this can be problematic, and can present a unique set of compositional challenges. Furthermore, each subject demands a tailored shooting style. In wildlife photography, for example, different animals vary in their behaviour and, therefore, the photographer must adjust how they focus, meter and compose their shots.

When considering these challenges, it is imperative that camera handling becomes instinctive and that the photographer can access settings and features, without having to take their eye away from the viewfinder. Any camera properties that slow the handling process will act to increase the number of missed shots.

Setting up your camera to work for you, rather than the inverse, is a valuable mindset. Learn the strengths and weaknesses of your gear, so you can predict where it will introduce difficulties and devise workarounds. Make use of user-defined shooting modes, where you can save and access most-used camera settings, to speed up how you adapt to changing conditions.

Don't be afraid to experiment with preset 'scene' modes in rapid situations — while not as controllable, they are useful alternatives to manual shooting, where you want to concentrate less on the technical aspects of exposure and more on framing, focusing and capturing your subject.

USE VIEWFINDER GRID LINES
Turn on the optional digital grid line display in your viewfinder, to make it easier to judge when the horizon is straight, even with the camera raised to your eye. This will also help you recognise when wide-angle and perspective distortions have become an image-degrading issue.

PERSONALISE BUTTON LAYOUT
TAILOR THE FUNCTIONALITY OF YOUR CAMERA CONTROLS TO BETTER FIT YOUR PREFERRED SHOOTING STYLE.

Enthusiast-level cameras possess far more features than they do physical controls, meaning the default functions of the body's buttons and dials are essentially a suggested layout by the manufacturer. It is possible to re-assign these to operate most-used features and to reorganise handling, to be more logical to the user. This speeds up camera work in fast-paced situations, resulting in a more enjoyable shoot. Follow these steps to get started:

01 LOCATE CUSTOM FUNCTIONS
On the majority of cameras, button function assignment is done from within the Custom Function menu. On this Nikon camera, there is a sub-menu which provides direct access to control layout options.

02 USE FUNCTION BUTTONS
Many camera models feature additional buttons dedicated to the assignment of user-defined functions. Select a button in the camera menu and choose a function to which you would like one-touch access.

03 CHOOSE COMMAND DIAL OPERATION
Decide what you would like the front and back control wheels to operate. This may be the standard aperture or shutter speed setting, or you may opt to deactivate a dial to avoid accidental alterations.

© Vladimir Kochkin
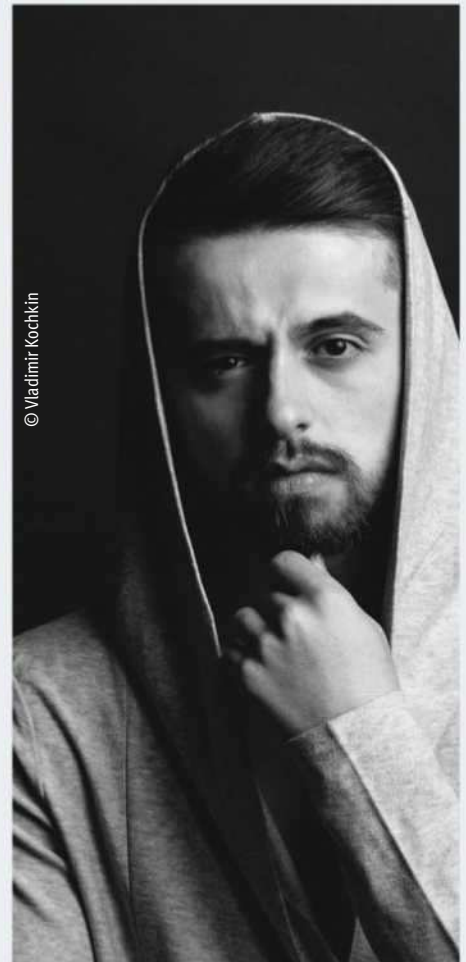
© Vladimir Kochkin

Left
ON-SHOOT FREEDOM
Having your camera set up so that it is aligned with your style will prevent interruptions to your creative thought process.

Above
YOUR FREE CAMERA
Analyse what your main 'complaints' are during your shoots and see how your camera can be adapted through customisation.

USE A BATTERY GRIP
INTRODUCING IMPROVED HANDLING IN ADDITION TO EXTRA POWER, BATTERY GRIPS REPRESENT A GOOD INVESTMENT.

The second battery slot provided by a battery grip extends shooting possibilities in multiple ways. Most obviously, the power advantages are a major benefit, especially when away from a power outlet for long periods. However, many portrait photographers buy them for the vertical handgrip and second shutter button that they may feature. This enables the user to rotate the camera and shoot more comfortably in portrait orientation, without having to adopt a different shooting posture.

01 UNFAMILIAR AND UNSTABLE
Without a grip, portrait orientation requires photographers to stretch their hand to reach the shutter button — uncomfortable on longer shoots.

02 NATURAL HANDLING
Battery grips can help to provide a method of shooting portrait-format images in the same way as when shooting in landscape, extending your shooting opportunities.

CUSTOMISE AF SENSITIVITY
FOR PHOTOGRAPHING FAST-MOVING SUBJECTS, CONTINUOUS AUTOFOCUS CAN BE USED TO TRACK IT, MAINTAINING A FOCUS LOCK.

However, a potential downside to using this mode is that objects within the frame can confuse the AF system into re-adjusting focus incorrectly. Use the Custom Function menu to reduce its sensitivity to novel objects entering the scene, to limit the risk of losing focus on your intended subject. This is especially applicable in low-light or low-contrast lighting conditions. ■

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BUYER'S GUIDE

YOUR READY RECKONER TO THE BEST TECHNOLOGY PRODUCTS

The *TechLife* team finds the best budget, value and performance products, and the latest releases in the top technology categories. If you believe there are other products that deserve the title in any of the tech categories, let us know and give us your reasons why in 50 words or less. Equally, if there's a hot new product that's worthy of attention, we want to know. Send your email to techlife@futurenet.com.

NETWORKING EQUIPMENT

ADSL/VDSL ROUTERS (WITH MODEM)

[BEST BUDGET]
D-Link DSL-G225
$80 | www.dlink.com.au
A basic, NBN-ready 300Mbps Wi-Fi ADSL router with four LAN ports. Good wireless range and coverage.

[BEST VALUE]
TP-Link Archer D7
$170 | www.tp-link.com.au
The UI is a bit no-frills, but once set up, this is a very solid AC1900 router for a price well below the average.

[BEST PERFORMANCE]
Netgear Nighthawk X8 D8500
590 | www.netgear.com.au
The price is eye-watering, but this tri-band 802.11ac modem-router truly has it all.

[NEW ON SHELF]
D-Link Cobra DSL-5300
$549 | www.dlinlk.com.au
This NBN-ready modem-router promises 4K streaming and online gaming across an entire home.

BROADBAND ROUTERS (NO MODEM)

[NEW ON SHELF]
Netgear Nighthawk XR 500
$449 | www.netgear.com
A router for online gaming, replete with software so you can see your ping in real time. Intense.

[BEST VALUE]
TP-Link Archer C3150
$290 | www.tp-link.com.au
For a modern home streaming ultra high-def video, this handsome unit will run a 2,166Mbps AC network.

[BEST PERFORMANCE]
ASUS RT-AC88U
$425 | www.asus.com/au
This full-featured unit is overflowing with options and settings, plus it has super-fast wireless.

PRICE DROP
[BEST MESH-NETWORKING KIT]
Netgear Orbi RBK50
$549 | www.netgear.com.au
Mesh-networking has arrived with this fantastic, great-performing router and extender kit.

NETWORKING ACCESSORIES

[BEST WIRELESS EXTENDER]
ASUS RP-AC68U
$240 | www.asus.com/au
With 5 Gigabit Ethernet ports, this AC1900 Wi-Fi extender's built-in LEDs help you figure out the best placement.

PRICE DROP
[BEST WIRELESS BRIDGE]
ASUS EA-AC87
$209 | www.asus.com/au
This bridge is a great way of linking up to four wired Gigabit devices to a 1,300Mbps AC network.

[BEST POWERLINE ADAPTER (BUDGET)]
TP-Link TL-PA8010P
$125 | www.tp-link.com.au
A pair of 1,200Mbps adapters that proved to be both fast and affordable in our most-recent roundup.

[BEST POWERLINE ADAPTER WITH WI-FI EXTENSION]
Edimax HP-5102Wn
$60 per unit | www.edimax.com
This fast Ethernet powerline adapter throws in an 802.11n Wi-Fi access point for both wired and wireless.

NETWORK ATTACHED STORAGE DEVICES

[BEST BUDGET]
QNAP TS-228
$190 (diskless) | www.qnap.com
Despite the bargain pricepoint, this 2-bay NAS is feature packed and lets you install apps to add more functions.

[BEST VALUE]
Asustor AS-3102T
$280 (diskless) | www.asustor.com
This two-bay NAS offers excellent features and can double as a media player, with Kodi and HDMI-output to your TV.

[BEST PREMIUM]
Synology DS916+
$660 (diskless) | www.synology.com
If you need more space, this four-bay model lets you install apps and can even transcode 4K videos.

[NEW ON SHELF]
Synology DS1517+
$1,100 | www.synology.com
A 5-bay NAS with 4 x Gigabit Ethernet ports and quad-core Atom chip, this one's for SMBs that need lots of performance.

GETPRICE

WWW.GETPRICE.COM.AU

BUYER'S GUIDE
READY RECKONER

PERSONAL & HOME AV GEAR

WIRELESS SPEAKERS

[BEST BUDGET]
UE Wonderboom
$130 | www.ultimateears.com
This new Bluetooth portable gets you great 'UE quality' sound at a neat price.

[BEST VALUE]
JBL Pulse 3
$299 | www.jbl.com.au
The lightshow sets it apart, but it's the great soundscape of this waterproof speaker that will keep your attention.

[BEST MULTIROOM SYSTEM]
Sonos One
From $299 | www.sonos.com
Turn it on and hear to the sound that fills your room — you won't want anything else. Expandable, with Alexa support.

[NEW ON SHELF]
Bose Soundlink Micro
$170 | www.bose.com.au
This more-affordable, palm-sized Bose option still outputs great sound and is waterproof to boot.

MUSIC HEADPHONES

[BEST VALUE]
Plantronics BackBeat 505
$120 | www.plantronics.com.au
A great-sounding set of Bluetooth cans with a long battery life and a super-keen price.

NEW ENTRY
[NEW ON SHELF]
Nuraphone
$449 | au.nuraphone.com
Both in- and on-ear for total immersion. Smart personalised audio profile results in world-class sound.

[BEST NOISE-CANCELLING]
Bose QC35 II
$499 | www.bose.com.au
Not a huge upgrade, but still the best noise-cancelling cans, with well-balanced audio and superb comfort.

[BEST WIRELESS IN-EARS]
Jaybird Freedom 2
$229 | www.jaybirdsport.com/en-au
These neat in-ears offer great sound quality and include a compact backup battery, and easy size adjustment.

MEDIA PLAYERS

[BEST BUDGET]
Google Chromecast Ultra
$99 | play.google.com
Google's 4K wireless HDMI dongle makes it easy to stream media content to your TV and has high-speed Wi-Fi.

[BEST ALL-IN-ONE MEDIA PLAYER]
Telstra TV 2
$192 | www.telstra.com.au
It's 4K HDR10 compatible and has great support for all the local streaming and catch-up services.

[BEST 4K BLU-RAY PLAYER]
Xbox One S
From $329 | www.xbox.com
With support for 4K Blu-ray and Netflix streaming, the most compact Xbox is a surprisingly capable media device.

[NEW ON SHELF]
Amazon Fire TV Stick
$69 | www.amazon.com.au
This basic 1080p streaming stick is based on Android and gives you access to over 4,000 apps and games.

DATA PROJECTORS

[BEST BUDGET]
Epson EB-W32
$700 | www.epson.com.au
A super-bright, portable 3LCD, WXGA unit at a nice price. Cheap lamps, too.

[BEST PORTABLE]
Epson EB-1761W
$1,199 | www.epson.com.au
One of the most compact 'full-size' projectors, this WXGA unit is only 1.7kg and new lamps are just $120.

[BEST HOME THEATRE]
Epson EH-TW5600
$1,050 | www.epson.com.au
A bright 1080p LCD-based model, with very cheap replacement lamps and nice, neutral colours.

[NEW ON SHELF]
Optoma UHD65
$5,299 | www.ambertech.com.au
Designed for small living rooms, this 4K HDR projector will splash a 100-inch image all over your walls.

TVS

[BEST BUDGET TV]
Kogan MU9500 (55-inch)
$800 | www.kogan.com.au
A big curved telly for a dirt-cheap price, this 4K unit's image quality is great, but it's a bit light on apps.

[BEST MAINSTREAM TV]
Hisense 55M7000UWG
$1,500 | hisense.com.au
A great interface and solid image quality makes this a very good buy at the under-$2,000 price point.

[BEST PREMIUM TV]
LG OLED55C7T
$2,999 | www.lg.com/au
This 55-inch OLED packs all the must-haves — native 4K, HDR support (with Dolby Vision) and superb pictures.

[BEST LUXURY TV]
Sony Bravia A1 4K OLED (KD-65A1)
$7,499 | www.sony.com.au
Boasts powerful and effective sound, a fantastic bordeless design and, of course, stunning image quality.

LAPTOPS, TABLETS & SMARTPHONES

LAPTOPS

[BEST BUDGET]
Acer Aspire E5-575-539R
From $699 | www.acer.com.au
This 15.6-incher includes a passable 1,366 x 768-pixel LCD screen, and is good value if all you need is the basics.

[BEST ULTRABOOK]
Dell XPS 13 (2018)
From $2,099 | www.dell.com.au
Dell isn't messing with the formula. A barely-there bezel around a 4K screen, ultra-light and ultra-slick, at a price.

NEW ENTRY
[BEST GAMING]
Razer Blade Pro
From $3,399 | www.razerzone.com.au
Thinner than most gaming rigs despite the screen size, and uncompromising in its top 4K GTX1080 specs.

NEW ENTRY
[NEW ON SHELF]
Gigabyte Aero 15-15WV8
From $2,899 | www.gigabyte.com.au
A 15.6-inch gaming rig squeezed into an ultra portable shell with a stunning thin bezel display.

[BEST BUDGET IPHONE]
Apple iPhone 5S

$370 | www.apple.com/au
If you must have an iPhone, select stores still offer the 4-inch 5S at a reasonable price.

[BEST BUDGET ANDROID]
Oppo A57

$299 | www.oppo.com.au
A single-SIM 4G handset that packs two great cameras, a 5.2-inch display, 32GB storage and a microSD slot.

[BEST PERFORMANCE]
Motorola Moto G5 Plus

$350 (16GB) | www.motorola.com.au
A classy 5.2-incher with quality internals, good camera and fast-charging support.

[NEW ON SHELF]
Huawei Mate 10

$899 (64GB) | www.huawei.com
Undercuts the other flagships while packing an OLED display and a camera that'll worry some DSLRs.

[BEST BIG SCREEN]
Samsung Galaxy Note 8

$1,499 (64GB) | www.samsung.com/au
It's super-exxy, but this 6.3-inch, stylus-bearing beast is the best productivity-focused phone ever.

[BEST PREMIUM — TIED]
Samsung Galaxy S9+

From $1,349 | www.samsung.com/au
The S9+ is a big phone with a fantastic camera, microSD slot, waterproofing and a tough chassis.

[BEST PREMIUM — TIED]
Apple iPhone 8

From $1,079 | www.apple.com/au
It's a minimal update on last year's model, but the 4.7-inch iPhone is the best all-rounder for most Apple fans.

[NEW ON SHELF]
Apple iPhone X

From $1,579 | www.apple.com/au
It's the most expensive iPhone ever, and it's terrific, though it swaps Touch ID for facial recognition.

[BEST BUDGET]
Samsung Galaxy Tab A 8.0

$295 (16GB) | www.samsung.com/au
If you absolutely can't afford the iPad mini 3, this Android alternative is an OK fallback.

NEW ENTRY
[BEST COMPACT]
Apple iPad mini 3 (refurbished)

$359 (16GB) | www.apple.com/au
The iPad mini 4's too expensive, so hold out until one of the 7.8-inch 3's pops up on Apple's AU refurb store.

[BEST PERFORMANCE]
Apple iPad 9.7 (2018)

From $469 (32GB) | www.apple.com/au
That gorgeous Retina IPS display is alluring, battery life is great. Still the best pick for a basic all-rounder tablet.

[BEST VERSATILITY]
Acer Switch 3

From $799 | www.acer.com.au
This detachable 2-in-1 has a stylus to work with Windows excellent pen input capabilities. A great all-rounder.

[BEST BUDGET]
Apple iPad Air (Refurbished)

From $369 (16GB) | www.apple.com/au
If the budget doesn't extend to an iPad Pro, get this 2013 unit instead. Re-check the refurbished store if it's ever sold out.

[BEST VERSATILITY]
HP Spectre x2

From $2,299 | www.hp.com/au
Cheaper than a Microsoft Surface with a glorious display, and the chassis makes this a stylish number indeed.

[BEST PERFORMANCE]
Apple iPad Pro (10.5-inch)

From $979 (64GB) | www.apple.com/au
This new 10.5-inch iPad's bigger screen hits the size sweet spot and makes a great 2-in-1.

[NEW ON SHELF]
Kogan Atlas C300 Convertible

$399 | www.kogan.com/au
A unibody design and 13.3-inch screen makes this a real looker. Basic internals aside, this is great value for money.

[BEST ROBOT VACUUM]
iRobot Roomba 980

$1,400 | www.irobot.com.au
Strong suction, brushless extractors, clever navigation: this Wi-Fi-connected vac leaves your home spotless.

[BEST SMART PLUG]
Belkin Wemo Insight Switch

$70 | www.belkin.com
This isn't just a way to switch your devices on and off; the WeMo also keeps close tabs on your energy usage.

[BEST WIRELESS SECURITY CAMERA]
Ring Video Doorbell 2

$329 | www.ring.com
A motion-detecting security camera, plus doorbell, it alerts you via your smartphone when you have a visitor.

NEW ENTRY
[BEST AI SPEAKER]
Panasonic SC-GA10

$379 | www.panasonic.com.au
Give your streamed music room to soar, and ask Google to tell you the weather, all in the same device.

[BEST POINT-AND-SHOOT]
Sony RX100 V

$1,699 | www.sony.com.au
The RZ100 V is speedy and performs well, with 4K video, 0.05 second autofocus and a Bionz Z processor.

NEW ENTRY
[BEST MIRRORLESS]
Sony Alpha A7 III

$3,099 | www.sony.com.au
Pinches some of the best bits from the A9s, with 4K recording and snappy AF. Perfect for newbies and pros alike.

[BEST CONSUMER DIGITAL SLR]
Nikon D3400

$850 (twin lens kit) | www.nikon.com.au
Aimed at newcomers, with a compact design, excellent battery life, decent AF system and reliable image quality.

[BEST ACTION CAM]
GoPro Hero 6 Black

$699 | www.gopro.com
The Hero can now shoot video at 4K @ 60fps, with improved electronic image stabilisation and low-light performance.

Side tabs: SMARTPHONES: ENTRY-LEVEL · SMARTPHONES: PREMIUM · TABLETS & 2-IN-1S (ENTRY LEVEL) · TABLETS & 2-IN-1S (PREMIUM) · HOME & LIVING · DIGITAL CAMERAS

BUYER'S GUIDE — READY RECKONER · LAPTOPS, TABLETS & SMARTPHONES · GADGETS & ACCESSORIES

BUYER'S GUIDE READY RECKONER

TABLET & SMARTPHONE ACCESSORIES

[BEST POWER BANK]
Xiaomi Power Bank Pro
$32 | www.mi.com/en
This 225g power bank packs 10,000mAh of extra power and can even fast-charge supported smartphones.

[BEST WIRELESS HARD DRIVE]
WD My Passport Wireless Pro 3TB
$399 | www.wd.com
A great way to share and back up your files anywhere, plus it has Plex media streaming.

[SMARTPHONE VR HEADSET]
Kaiser Baas VR-X Headset
$50 | www.kaiserbaas.com
This universal VR headset is a low-cost way to get in on the smartphone VR revolution and is comfortable.

[BEST MOBILE GAMEPAD]
iPega PG-9025
$25 | www.dx.com
You'll need to buy it online, but this gamepad is nice and responsive, and works with both iOS and Android.

PORTABLE HARD DRIVES

[BEST BUDGET]
WD My Passport 1TB
$89 | www.wd.com
WD's My Passport ranges come with security and backup software bundled in and good speeds for the price.

[BEST VALUE]
SIlicon Power Armor A85
From $109 | www.silicon-power.com
Near indestructible. We dropped it, took it for a dip in a pool, and drove a car over it, and the A85 didn't miss a beat.

[BEST PREMIUM]
Seagate Backup Plus 5TB
$280 | www.seagate.com
It's a little bulkier than the Ultra Slim, left, but if you need lots of storage on the go, this 5TB drive is a neat option.

[BEST HIGH-SPEED]
Samsung Portable SSD T5
From $199 (256GB) | www.samsung.com/au
With transfer speeds of up to 500MB/s, these portable USB 3.1 SSDs will move your data around supremely fast.

WEARABLES

[BEST SMARTWATCH FOR ANDROID]
Samsung Gear S3
$599 | www.samsung.com/au
The S3 is pricey, but it makes a great fitness tracker and smartwatch, and can last 3 days between charges.

[BEST SMARTWATCH FOR IOS]
Apple Watch 3
From $459 | www.apple.com/au
A tad cheaper and with optional 4G, Apple's third-gen Watch is a great companion for sporty iPhone owners.

[BEST FITNESS BAND]
Fitbit Charge 2
$249 | www.fitbit.com
A refinement on the Charge HR, this bigger tracker does all-day heartrate and automatic sleep tracking.

[BEST EXERCISE HEADPHONES]
BioConnected HR+
$279 | bioconnected.com
These headphones have a heart-rate sensor and a whole wodge of other tech to measure your run performance.

PC MONITORS

NEW ENTRY
[BEST BUDGET]
ViewSonic VX2757-mhd
$250 | www.viewsonic.com.au
This 27-inch 1080p display is the top of the budget tree with a 75Hz refresh rate and FreeSync support. Tasty.

[BEST VALUE]
ASUS VX239H
$230 | www.asus.com/au
This AH-IPS 23-inch matte LCD has great specs, a 1080p resolution and a nice price.

[BEST PROFESSIONAL]
BenQ PD3200U
$1,299 | www.benq.com.au
A 32-inch 4K IPS panel with HDR. Adheres to sRGB industry standards and doubles as a gaming monitor.

[BEST GAMING]
ViewSonic XG2703-GS
$899 | www.viewsonic.com.au
A 27-inch 1440p IPS display with great gaming chops and 144Hz refresh rate. It even has G-Sync support.

GAMING KEYBOARDS

[BEST BUDGET]
Tt eSports Poseidon ZX
$99 | www.au.ttesports.com
This basic compact board still has it where it counts, with solid performance and comfortable keys.

[BEST VALUE]
Logitech G610 Orion
$120 | www.logitech.com
Available in red, blue or brown switches, it's sedate enough for offices but still has gaming features.

[BEST PREMIUM]
Corsair K70 RGB Rapidfire
$190 | www.corsair.com
This Cherry MX Silver-switched 'board feels great under the fingers and has bright-as-hell RGB lighting.

[BEST LAPBOARD FOR LOUNGE-ROOM USE]
Razer Turret
$220 | www.razerzone.com
This lapboard is sleeker than most, with a magnetised mousepad to help keep the included mouse grounded.

GAMING HEADSETS

[BEST BUDGET]
Microsoft LifeChat LX-3000
$35 | www.microsoft.com.au/hardware
A cheap basic USB headset with noise-cancelling tech.

[BEST VALUE]
Cougar Immersa Pro
$99 | cougargaming.com
A fine approximation of 7.1 surround sound from a very comfortable set of headphones.

[BEST PERFORMANCE]
Audio-Technica ATH-AG1
$299 | www.audio-technica.com.au
A super-comfy headset with massive drivers and fantastic sound.

[NEW ON SHELF]
HyperX Cloud Alpha
$169 | www.hyperxgaming.com
Lightweight and with soft, the Cloud Alphas promise respectable bass and mids, and can be used anywhere.

PC GAMING MICE

[BEST BUDGET]
Logitech G402 Hyperion Fury

$49 | www.logitech.com
A hybrid-sensor gaming mouse with optical, gyro and accelerometer tracking, this one doesn't skip a beat.

[BEST VALUE]
Cooler Master MasterMouse MM520

$59 | coolermaster.com
A claw-grip number for right handers. Clunky switches aside it's very ergonmic and feels premium.

[BEST AMBIDEXTEROUS]
SteelSeries Sensei RAW

$80 | www.steelseries.com
Ditching unneeded features, this is a lean, mean headshotting machine that's good for lefties and righties.

[BEST WIRELESS]
Logitech G703

$99 | www.logitech.com
Cheaper than its G903 sibling, this mouse uses the same wireless tech for excellent performance.

PRINTERS & MULTIFUNCTION CENTRES

[BEST BUDGET]
Canon Pixma MG2960

$36 | www.canon.com.au
An inkjet that can print, scan and copy in colour, send faxes, has Wi-Fi and can AirPrint and Google Cloud Print.

[BEST VALUE]
HP Officejet Pro 8710

$180 | www.hp.com/au
An inkjet with print, copy, scan and fax, a 50-sheet copying tray, double sided printing and wireless.

[BEST PHOTO PRINTER]
Epson Expression Premium XP-15000

$499 | www.epson.com.au
Incomparable photo prints at up to A3 size. A remarkable inkjet printer.

[BEST SMALL-BUSINESS LASER]
HP Colour LaserJet Pro MFP M277dw

$450 | www.hp.com/au
Built-in wireless, duplex print and scan, cloud and mobile print, and great print quality at a fair price.

PC GRAPHICS CARDS

[BEST BUDGET]
ASUS PH-GTX1050TI-4G

$230 | www.asus.com/au
You'll get respectable 1080p/Normal gaming performance from this affordable GeForce GTX 1050 Ti card.

[BEST VALUE]
ASUS DUAL-GTX1060-O3G

$350 | www.asus.com/au
With a GTX 1060 you can stretch to lower-detail 1440p gaming, or manage Ultra/1080p.

[BEST PREMIUM]
Gigabyte GV-N1070WF2OC-8GD

$630 | www.gigabyte.com.au
Stepping up to a GTX 1070 lets you game at 1440p, or pair it with a G-Sync monitor for smoother rendering.

[BEST EXTREME]
Gigabyte GV-N1080WF3OC-8GD

$800 | www.gigabyte.com.au
GTX 1080 prices have climbed recently, but this Gigabyte card is one of the fairer offerings.

PC MOTHERBOARDS

[BEST BUDGET]
MSI B250M Mortar

$135 | au.msi.com
A great companion for the Pentium G4560; has everything you need for under $150.

[BEST VALUE]
ASUS RoG Strix Z370-G Gaming

$289 | www.asus.com/au
Micro ATX done right, with enough space for two M.2 PCIe SSDs and support for 64GB of DDR4.

[BEST PREMIUM]
ASUS RoG Crosshair VI Hero

$349 | www.asus.com/au
Currently the best AM4 motherboard on the market — provides all the high-end features you need at a fair price.

[BEST EXTREME]
ASUS Prime X399-A

$579 | www.asus.com/au
This Threadripper board is feature-packed, with a highly-tweakable BIOS, great memory and storage support.

PC PROCESSORS

[BEST BUDGET]
Intel Pentium G4560

$79 | www.intel.com
This 7th-gen (aka Kaby Lake) CPU is great for those looking to build a quality budget rig.

[BEST VALUE]
Intel Core i5-8400

$269 | www.intel.com
This six-core Intel chip strikes a great balance between gaming and multimedia performance at a very keen price.

[BEST PREMIUM]
AMD Ryzen 7 1800X

$489 | www.amd.com
AMD's back with this octa-core screamer, which offers masses of performance for half the price of Intel.

[BEST EXTREME]
AMD Ryzen Threadripper 1950X

$1,399 | www.amd.com
If you're looking for high-end 3D design or image and video editing chops, this is amazing bang-for-buck.

SOLID-STATE DRIVES

[BEST BUDGET]
Crucial MX300 (275GB)

$130 | www.crucial.com
The affordable MX300 drives are great value and fast-enough to max out the SATA interface. Can't go wrong here.

[BEST VALUE]
Samsung 860 EVO 500GB

$239 | www.samsung.com/au
500GB is the ideal spot for cost-per-gig. This updated drive from Samsung is a great choice.

[BEST PREMIUM]
Crucial MX500 1TB

$390 | www.crucial.com
A five-year warranty is the icing on a super-fast SATA SSD cake that offers great bang for buck.

[BEST EXTREME]
Samsung 960 Pro M.2 512GB

$425 | www.samsung.com/au
It's pricey, but with 3TB/s read and 2TB/s write speeds, this M.2 drive is stupid-fast.

PC PERIPHERALS

PC COMPONENTS

BUYER'S GUIDE READY RECKONER

Ridiculous tech exposed

WE SCOUR THE DARK AND OFTEN PERVERTED CORNERS OF THE INTERNET TO BRING YOU THE WEIRDEST TECH AROUND. YOU MAY WANT TO BRING A SICK BOWL OR A BOX OF TISSUES TO CRY INTO...

[CARMEL SEALEY]

Sobro Smart Side Table

SIMPLIFY YOUR LIFE AND IMPROVE YOUR SLEEP.

sobrodesign.com

Bedside tables used to be tables — humble pieces of furniture that provided you with a surface to place a lamp, a book, a glass of water with your teeth in, and perhaps a drawer or two to store personal items. The Sobro, however, is sporting almost every smart function we can think of. With a wireless charging pad, fridge, Bluetooth speakers, LED lighting and a companion app, the Sobro 'table' really is more than a piece of bedroom furniture. It also claims that it can help you get a good night's sleep. Its LEDs can be programmed to simulate sunset and sunrise, and also includes a white noise generator — although, the creators make the note that it probably won't be able to block out your partner's snoring. Coming from someone with insomnia, we doubt this US$900 table would help us sleep.

Picture: Endgadget

Sniffy Market

THE TRY-BEFORE-YOU-BUY DEVICE FOR YOUR NOSE.

www.sniffy.fr/home

Currently in the prototype stage, the Sniffy Market is a device to help consumers experience the smell of products without having to buy them first. It comes with a touchscreen, camera and carousel where various scents will be installed by the retailers. We can see how this technology could be of interest to those in the food and drinks, perfume and personal hygiene industries. Imagine going into a shop, seeing a packet of spices, for instance, and being able to consult a device before buying the packet so you can get a test whiff. It's an interesting idea, but one that we believe is unrealistic. Think of your local supermarket. Thousands of products would have to be artificially recreated for this olfactory device — a huge task. But since we all know that an artificial smell is never the same as its original, what's the point? Also imagine having to reload the smells once they run out... We would argue a 'How hot is this, really?' spice indicator would be better, where wimps like your humble writer could test the level of spiciness in a sauce before buying it...!

PAWCALL

TRAIN YOUR PET TO CALL YOU.

petchatz.com/product/pawcall

It's hard leaving your furry friend at home when you need to get to work, seeing their little faces through the window, watching you walk down the path with those big pleading eyes... Makes you just want to call in sick! Well, now you can make your absence a little less painful for your pooch or feline with the PawCall. It's like a phone for your pet. Simply train them to press the device and it will link you up! You can play games with them, distribute treats, as well as have a Skype-like call with them over PetChatz HD. And all for just US$100! Seriously now, though, this is in no way a replacement for proper quality time with your pet. At best, it will give your dog a moment's distraction, and at worst, it will confuse or scare them — hearing your voice in the house but not being able to find you. It's like a horror movie. Poor pooches... Cats probably couldn't care less, though. They'll just raise their heads, look at your tiny face on the monitor with disdain and then go back to sleep. And rightly so, in our opinion.

HAPIFORK

THE SMART FORK LOOKING OUT FOR YOUR HEALTH.

www.hapi.com/product/hapifork

If you're having trouble losing weight and you've tried everything, HAPI is hoping that its smart fork will be the product for you! The company claims that eating too fast leads to poor weight control, so they've created the HAPIfork to help you slow down. It possesses indicator lights and a gentle vibration feature that will engage when it thinks you're eating too fast, namely when your 'fork servings' are too frequent. The data it collects on how long it takes you to eat your meal, how many times you brought food to your mouth and how long the gaps were between mouthfuls is combined into your profile on their website and app, which includes a coaching program to help you "improve your eating behavior". We would be interested to know how it deduces you're eating too fast if you're switching between steak and soup, though. In the end, sure... if it works for you, but as a first choice weight loss option? No. ∎